

National Capacity Needs Self Assessment for
Global Environmental Management

THEMATIC ASSESSMENT REPORT
ON
BIODIVERSITY

Ministry of Environment & Natural Resources
Battaramulla, Sri Lanka.

2007

**National Capacity Needs Self Assessment for
Global Environmental Management**

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Ministry of Environment & Natural Resources
Sri Lanka

2007

THEMATIC ASSESSMENT REPORT ON BIODIVERSITY

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ABBREVIATIONS AND ACRONYMS

ABS	Access and Benefit Sharing
ACF	Assistant Conservator of Forests
ADA	Access Determining Agency
ADB	Asian Development Bank
AG	Attorney General
AgBC	Agricultural Biotechnology Centre
APC	Areas of Particular concern
BCAP	Biodiversity Conservation Action Plan
BDS	Biodiversity Secretariat
BIA	Biodiversity Impact Assessment
BMARI	Bandaranaike Memorial Ayurvedic Research Institute
BOI	Board of Investment
CARP	Council for Agricultural Research Policy
CBD	Convention on Biological Diversity
CBO	Community Based Organisation
CCA	Coast Conservation Act
CCC	Community Coordinating Committees
CCD	Coast Conservation Department
CD	Compact Disc
CEA	Central Environmental Authority
CEPA	Global Initiative on Communication, Education and Public Awareness
CEPOM	Committees on Environment Policy and Management
CFE	Caring for the Environment
CFHC	Ceylon Fisheries Harbour Corporation
CIEDP	Committee on Integrating Environment and Development
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of Parties
CRI	Coconut Research Institute
CRMP	Coastal Resources Management Project
CZMP	Coastal Zone Management Plan
DAPH	Department of Animal Production and Health
DCC	District Coordinating Committees
DEA	Department of Export Agriculture
DFAR	Department of Fisheries and Aquatic Resources
DFO	District Forest Officer
DG	Director General
DNA	Deoxyribonucleic Acid
DOA	Department of Agriculture
DSD	Divisional Secretariat Division
DWLC	Department of Wildlife Conservation
EEZ	Exclusive Economic Zone
EFL	Environmental Foundation Ltd
EIA	Environmental Impact Assessment
EIMS	Environmental Information Management System
EMC	Environmental Management Component
EMD	Environmental Management Division
EMFDP	Environmental Management in Forestry Development Project
EMO	Environmental Management Officer
EMRP	Emergency Management and Response Plan
EPL	Environmental Protection Licence
EU	European Union
FAO	Food and Agriculture Organisation
FCRDI	Field Crops Research and Development Institute
FD	Forest Department
FFP	Functional Food Product
FFPO	Fauna and Flora Protection Ordinance
FO	Forest Ordinance

FP	Focal Point
FRMP	Forest Resources Management Project
FSDP	Forestry Sector Development Project
FSMP	Forestry Sector Master Plan
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographical Information Systems
GMF	Genetically Modified Food
GMO	Genetically Modified Organism
GNP	Gross National Product
GPS	Global Positioning System
GR	Genetic Resources
GSMB	Geological Survey and Mines Bureau
GTZ	German Agency for Technical Cooperation
GURTS	Genetic Use Restriction Technologies
ha	hectares
HORDI	Horticultural Research and Development Institute
ICTAD	Institute for Construction Training and Development
ILD	International Liaison Division
INSCOM	Institutional Strengthening of Oil Spill Contingency Management Project
IPR	Intellectual Property Rights
IRDP	Integrated Rural Development Project
IS	Instructional Strengthening
IT	Information Technology
ITI	Industrial Technology Institute
ITPGR	International Treaty on Plant Genetic Resources
IUCN	The World Conservation Union
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
km	kilometers
LA	Local Authority
LAN	Local Area Network
LMO	Living Modified Organism
LRC	Land Reforms Commission
MAB	Man and Biosphere
MASL	Mahaweli Authority of Sri Lanka
MAT	Mutually Agreed Terms
MDGs	Millennium Development Goals
MEA	Multi-lateral Environmental Agreement
MFN	Most Favoured Nation
MOE	Ministry of Environment
MOFE	Ministry of Forestry and Environment
MOH	Medical Officer of Health
MOU	Memorandum of Understanding
MPPA	Marine Pollution Prevention Authority
MTA	Material Transfer Agreement
NAQDA	National Aquaculture Development Authority
NARA	National Aquatic Resources Research and Development Agency
NAREPP	Natural Resources and Environmental Policy Project
NARESA	Natural Resources, Energy and Science Authority
NARP	National Agricultural Research Policy
NARS	National Agricultural Research System
NBG	National Botanic Gardens
NBRO	National Building Research Organization
NCR	National Conservation Review
NCS	National Conservation Strategy
NCSA	National Capacity Needs Self-Assessment for Global Environmental Management
NEA	National Environmental Act
NEAP	National Environmental Action Plan

NEC	National Experts' Committee on Biodiversity
NFP	National Forest Policy
NGO	Non Governmental Organization
NHDA	National Housing Development Authority
NIE	National Institute of Education
NRC	National Research Council
NSCAG	National Species Conservation Advisory Group
NSF	National Science Foundation
NWSC	National Wetlands Steering Committee
NZG	National Zoological Gardens
OPRC	Oil spill preparedness and response Cooperation
ORDE	Organization for Resource Development and Environment
OUSL	Open University of Sri Lanka
PA	Protected Area
PAA	Project Approving Agency
PAM&WLCP	Protected Area Management and Wildlife Conservation Project
PGRC	Plant Genetic Resources Centre
PIC	Prior Informed Consent
PILF	Public Interest Law Foundation
R&D	Research and Development
RARDC	Regional Agricultural Research and Development Centre
RDA	Road Development Authority
RFO	Range Forest Officer
RNA	Ribose Nucleic Acid
RRDI	Rice Research and Development Institute
RRi	Rubber Research Institute
Rs	Rupees
SAARC	South Asian Association for Regional Cooperation
SAM	Special Area Management
SCOR	Shared Control of Natural Resources
SCPPC	Seed Certification and Plant Protection Centre
SIA	Strategic Impact Assessment
SLAAS	Sri Lanka Association of Advancement of Science
SLANRMP	Sri Lanka Australia Natural Resource Management Project
SLEJF	Sri Lanka Environmental Journalists Forum
SLFI	Sri Lanka Forestry Institute
SLISTIC	Sri Lanka Scientific and Technical Information Centre
SLISTINET	Sri Lanka Scientific and Technical Information Network
SLLRDA	Sri Lanka Land Reclamation and Development Authority
SLPA	Sri Lanka Ports Authority
SLRC	Sri Lanka Rupavahini Corporation
SLSI	Sri Lanka Standards Institute
SLWT	Sri Lanka Wildlife Trust
SMEs	Small and Medium Enterprises
sq	square
SRI	Sugarcane Research Institute
STC	State Timber Corporation
TF	Task Force
TK	Traditional knowledge
TRI	Tea Research Institute
TRIPS	Trade Related-aspects of Intellectual Property Rights
TV	Television
UDA	Urban Development Authority
UN	United Nations
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations the Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

UNESCO	United Nations Educational Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Institute for Development Organisation
USA	United States of America
USAID	United States Agency for Assistance in International Development
VRC	<i>Vidatha</i> Resource Centres
VRI	Veterinary Research Institute
WCMC	World Conservation Monitoring Centre
WCP	Wetland Conservation Project
WLNPS	Wildlife and Nature Protection Society
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation
YES	Youth Exploration Society
YZA	Young Zoologists' Association

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METHODS USED AND SUMMARY FINDINGS OF THE BIODIVERSITY THEMATIC ASSESSMENT

Methods used for prioritisation of biodiversity thematic areas for capacity building:

- Desk research on biodiversity conservation needs and actions in the country, with special emphasis on the national Biodiversity Conservation Action Plan (BCAP), addendum reports and prioritised action in the Addendum to the BCAP, Caring for the Environment (the National Environmental Action Plan), the Coastal Zone Management Plan of 2004, the Forestry Sector Master Plan of 1995 and the National Biosafety Framework Project report.
- Detailed analysis of country obligations under all articles and sub-articles of the CBD.
- Visits to selected institutions with high responsibility for conservation of wild, agro, and livestock biodiversity and donor funded capacity building projects.
- Reference of reports on recently concluded donor funded projects.
- Questionnaire survey of institutions with some aspect of responsibility for biodiversity conservation, research or sustainable use.
- Questionnaire survey of institutional perception to gauge existing capacity to carry out mandated functions for biodiversity conservation and sustainable use, and for self assessment of capacity built through major donor funded projects.
- Focused workshops, mini-workshops, roundtables and meetings to (a) verify prioritised thematic areas, and (b) specify capacity building needs for each of these at systemic, institutional and individual levels for the priority areas. For each consultative meeting to identify capacity needs, customised materials (i.e. information notes, PowerPoint presentations, and/or brochures) were prepared after consideration of the issues to be addressed and the knowledge and interests of the groups. Experts in the specific areas addressed by roundtable meeting and mini-workshops were invited to brief the participants on existing capacity. These measures served to apprise the participants of the objectives of the meeting as well as to 'seed' the discussion by providing background information on the priority areas to be discussed.

The first identification of priority areas requiring further capacity building to meet CBD obligations and to benefit from convention provisions in order of priority ranking:

- Capacity to reach sectoral and cross-sectoral support to mainstream biodiversity conservation and sustainable use in accordance with the ecosystem approach. (main report: item 5.1.2 & 5.1.4)*
- Capacity to communicate, educate and create public awareness on the importance of biodiversity for sustainable development to mobilize commitment and participation for biodiversity conservation.* (main report: item 5.11)
- Capacity to develop and introduce measures and mechanisms for a national Access (to genetic resources) and Benefit Sharing (ABS) regime which ensures fair and equitable benefit-sharing from such use, including benefits to traditional knowledge holders. (main report: item 5.3.1)
- Capacity to negotiate to fulfil national needs for biodiversity conservation and sustainable use at CBD COP and other global fora.* (main report: item 5.10)
- Capacity to develop and implement national policy frameworks, plans and programmes on biodiversity conservation and sustainable use with cross-sectoral support.* (main report: item 5.1.1)
- Capacity to establish effective inter-institutional coordination for identification and monitoring of critical components of biodiversity and threats to biodiversity.* (main report: item 5.5)
- Capacity to implement a multi-institutional coordinated effort to identify, design and establish a rational network of areas needing protection in accordance with the ecosystem approach to biodiversity conservation.* (main report: item 5.7)

- Capacity to design, develop and implement multi-stakeholder participation for species specific *in-situ* and *ex-situ* conservation measures to promote conservation, management and recovery of threatened species and sustainable use of commercially important species as consonant with the ecosystem approach.** (main report: item 5.9)
- Capacity for agencies responsible for *in-situ* conservation to institutionalise participatory and integrated management of ecosystems and their bio-resources as consonant with the ecosystem approach and poverty eradication.* (main report: item 5.8)
- Capacity to design, develop, share, maintain and manage relevant information and data management systems to support biodiversity conservation action within the country and to access biodiversity information from external sources.* (main report: item 5.6)
- Capacity to develop and introduce measures to enhance national capacity for biotechnology using genetic resources. (main report: item 5.4)

Other important areas for capacity building:

- Capacity to develop and enforce legal and regulatory frameworks to promote biodiversity conservation and related activities.* (main report: item 5.2)
- Capacity to develop and introduce measures and mechanisms for conservation and use of traditional knowledge to permit fair and equitable sharing of benefits to the knowledge holders.* (main report: item 5.3.2)
- Capacity to access relevant financial support systems (through budgetary provisions and external funds) and to design and implement relevant incentive systems and valuation mechanisms.* (main report: item 5.1.3)

* These are cross-sectoral capacity requirements for all three conventions

** relevant for the CBD and UNFCCC.

The above priority areas were presented at several workshops, verified and amended, and the underlying capacity gaps in these were assessed and analysed at interviews, meetings, workshops and roundtables. The assessment of capacity building needs and possible interventions in respect of these areas deemed priority to fulfil obligations under the CBD are presented below under items 5.1 to 5.11. Several of the top ranked priority areas for capacity building given above are discussed in detail under various sub-headings in the main report under items 5.1-5.11 where such separate treatment was warranted. Similarly, some top ranked priority areas were brought under one heading in the main report to address capacity building needs that were similar.

Priority needs for capacity building:

5.1 Reaching sectoral and cross-sectoral support for effective national planning and coordination to mainstream biodiversity conservation and sustainable use in accordance with the ecosystem approach

This is a cross-sectoral issue relevant for all three Rio Conventions.

The required capacity was addressed separately under three broad areas:

- (A) Capacity to reach sectoral and cross-sectoral support to mainstream biodiversity conservation and sustainable use in accordance with the ecosystem approach.
 - (B) Capacity to develop and implement national policy frameworks, plans and programmes on biodiversity conservation and sustainable use with cross-sectoral support.
 - (C) Capacity to enhance business sector involvement in biodiversity conservation and sustainable use of bio-resources.
- **Overall priority capacity building needs under 5.1**
 - There is need to build political will and support for biodiversity conservation and sustainable use.
 - There is need for an overall holistic approach to national planning and budgeting which addresses biodiversity (and other environmental) issues and valuation adequately.

- There is inadequate awareness and commitment in the economic and development sectors about biodiversity conservation in the context of national development and poverty eradication.
- There is low capability in agencies responsible for *in-situ* and *ex-situ* conservation for communication, education and public awareness to better market their activities to financial and development sector organisations and funding agencies.
- There is low capacity for project proposal and budget preparation (i.e. to access both national and donor funding).
- There is no mechanism to promote accountability among all levels of stakeholders responsible for biodiversity conservation, including institutions with major impacts on biodiversity.
- There is low capacity to consider tax concessions and other incentives for the local private sector for biodiversity conservation and sustainable use as consonant with national interests.
- An effective coordination mechanism for mainstreaming biodiversity conservation into other sectors and obtaining cross-sectoral support for biodiversity planning and management should be instituted via Task Forces set up to implement the BCAP and the addendum (once it is accepted).

Possible interventions:

- Capacity building within the BDS to obtain sectoral and cross-sectoral support for implementing national biodiversity plans and strategies and for an effective coordinating mechanism to facilitate implementing the BCAP (*the blue print has been prepared for enhancing coordination by the BDS by Task Force 11 of the Addendum - this could be built on*).
- A major national biodiversity (or environmental) communication initiative by the BDS/MOE. *[GEF funds could be sought for a major multi-institutional capacity building initiative in this regard]*
- Re-establishing the mid-professional level biodiversity networks to better mainstream biodiversity conservation into sectoral and cross-sectoral action. *[BDS to initiate action]*.
- Enhancing capacity for biodiversity valuation, bio-economic modelling and providing incentives to promote conservation (*awareness of the importance of biodiversity valuation should precede such action*).
- Enhancing biodiversity planning skills in state agencies with a major responsibility for biodiversity conservation and sustainable use.
- Bringing together researchers, scientists and the local private sector through awareness creation among the business community on biodiversity conservation needs and possible business opportunities for sustainable use of bio-resources. *[MOE/BDS/ NSF to institute a regular programme between public sector and private sector with the assistance of NSF/Ministry of Science and Technology and civil society organisations (e.g. Rotary Club) via the Chambers of Commerce]*.

Major gaps in policy that preclude inclusion of biodiversity into cross-sectoral plans and programmes:

There are no policies for:

- providing access to indigenous genetic resources (and biochemical substances produced by genes of indigenous species) in the context of gaining fair and equitable benefits from such provision. (This should also indicate national requirements to potential external partners with whom collaboration is likely (or is already happening) for research on Sri Lanka's genetic resources).
- biodiversity information exchange;
- biotechnology using indigenous (and exotic) genetic resources - especially when there is foreign collaboration;
- identification of a national network of areas for protection through a multi-institutional, multi-stakeholder process.
- promoting *ex-situ* conservation and captive breeding of threatened or commercially important protected species.

Further:

- The current livestock development policies do not adequately address conservation and sustainable use of livestock biodiversity.
- The new policy to be developed for agriculture should also take conservation of agro-biodiversity into consideration.

The main gaps in the legal framework and enforcement of environmental laws:

- Absence of legal measures to enable equitable benefits to the holders of traditional knowledge when such information is used in combination with genetic resources or for sustainable use of other components of biodiversity by others - including both in- country or external Parties.
- Absence of legal mechanisms to protect ownership of such traditional knowledge.
- There are deficiencies in the:
 - Mines and Minerals Act No. 33 of 1992 as the offences under it are not cognizable. Hence law enforcement authorities do not have adequate powers to enforce some of these laws.
 - National Environmental Act No. 56 of 1988 in respect of EIA procedures for mining and prevention of biodiversity loss.
- Field officers of the CEA are constrained due to inadequate delegated authority.
- The general public are not familiar with environmental laws and citizens rights in this regard.
- There is inadequate trained manpower in the Police Department, and an overall inadequacy of logistics in all relevant departments, for effective enforcement of environmental laws at all levels, as well as external interference that precludes efficient law enforcement.

5.2 Reaching effective enforcement of laws and regulations to promote biodiversity conservation and sustainable use

This is a cross-sectoral issue relevant for all three Rio Conventions.

Possible interventions:

- Training and awareness programmes are required for police officers to enhance their skills and knowledge on: (a) biodiversity related laws, (b) protected species, and (c) concepts of biodiversity conservation and sustainable use as relevant to enforce the relevant laws. This can be provided via the routine training programmes offered to police officers in the Police Department with support from **experts for training on legal issues and biodiversity, and with assistance from departments responsible for implementing environmental laws (e.g. FFPO, FO CCA, Mines and Minerals Act, etc.).**
- Training on species identification is required for customs and quarantine officials for law enforcement [visual aids/databases are important to assist capacity building in this regard. **[Selected NGOs could assist with the training if they are provided with funds to prepare such material].**]
- Establishing a special force within the Police Department with trained officials competent to enforce environmental laws by regional/local level police officers.

5.3 Developing and introducing measures and mechanisms for a national Access (to genetic resources) and Benefit Sharing (ABS) regime which ensures fair and equitable benefit-sharing from such use, including benefits to traditional knowledge holders

(A) Establishing a national access (to genetic resources) and benefit sharing (ABS) regime.

Currently access occurs at various levels in the country and through various institutions through illegal channels (e.g. by industries operating through the BOI, illegal smuggling, etc.) and legal channels (e.g. in the DOA as exchange for research and taxonomic purposes, as commercial products that have value in its unmodified form [under a permit system], specimens sent out legally by various institutions (e.g. universities, research institutions and the national herbarium) for taxonomic identification, and during collaborative biotechnology projects with foreign collaborators.

● Capacity needs and possible interventions

Systemic:

- There is no national policy on Access and Benefit Sharing (ABS) and clear operational targets for a national regime on ABS.
- There are no guidelines on (a) what should be addressed when providing access to indigenous genetic resources for commercial or other use by external country parties, and (b) for negotiating benefit sharing when collaborating with other countries for research or commercial products development.

Institutional:

- There is no national ABS regime to coordinate institutions currently having the required mandate to regulate access to genetic resources (i.e. Access Determining Authorities).
- There is no formal institutionalized mechanism (i.e. a Focal Point, ABS units in ADAs [permit awarding authorities], advisory networks, etc.) to coordinate and facilitate a national ABS regime which ensure that access to genetic resources is regulated and illegal access is precluded.
- There is low capacity at present in the existing ADA for a national ABS regime that can comply with the benefit sharing requirements of the CBD.

Possible interventions:

- A major multi-institutional capacity building initiative for establishing an ABS regime in Sri Lanka.
[GEF funds should be sought for a major multi-institutional capacity building initiative for establishing an ABS regime in Sri Lanka].
- (B) Ensuring fair and equitable benefits from traditional knowledge associated with genetic resources

● Overall priority capacity needs and possible interventions

Systemic:

- There is no policy on benefit sharing with traditional knowledge holders (this should be addressed in a policy on ABS under a national ABS regime).
- The legal rights of traditional knowledge holders and the type of information that can be documented and archived to preserve IPR have not been correctly identified. As yet there appears to be very little remedial measures to protect IPR on traditional knowledge, but this should be investigated.
- There is poor understanding about sharing of benefits from traditional knowledge that is already in the public domain in Sri Lanka - particularly as the concept of what information is in the public domain and what is not is unclear to many.

Institutional:

- There is no institution or a centre within existing institutions to deal with this aspect.
- There is no meta-database of genuine traditional knowledge holders.
- There is poor capacity among civil society organisations and environmental NGOs to play a prominent watch dog function and to apprise traditional knowledge holders about their rights within an ABS regime and about IPR issues.

Individual:

- There is inadequate knowledge among managers of existing databases on traditional knowledge on IPR issues.

Possible interventions:

- A study to investigate (using expert networks): the issue of benefit sharing from traditional knowledge with the relevant knowledge holders, whether a *sui generis* system can be adopted, and whether benefits could be channelled to local communities through the normal regional administrative systems (e.g. Divisional Secretaries).
[the sub-committee comprising members of the legal team which developed the legal position paper for the NCSA ABS workshop and other relevant persons could look into the possibility of developing a sui-generis systems. This should be done prior to preparation of a policy on ABS].
- Initiating studies on alternative methods for protecting traditional knowledge associated with genetic resources (along with traditional knowledge on other technologies relating to sustainable use) rather than archiving them in databases which may not have the desired results (i.e. assisting traditional knowledge holders to pass down their knowledge through the oral tradition to a pupil of their choice).
- A Training of Trainers activity to apprise traditional Knowledge holders of their rights within an ABS regime and IPR issues. This could be through empowering civil society organisations and environmental NGOs to play a prominent watch dog function and to apprise traditional knowledge holders about their rights within an ABS regimes and about IPR issues.
[Members of environmental NGOs such as EFL, Environmental Journalists' Forum and Indigenous Practitioners fora could assist the ABS FP until a Centre for Traditional Knowledge is established].

5.4 Developing and introducing measures to enhance national capacity for biotechnology using genetic resources for sustainable use of biodiversity

● Overall priority capacity needs and possible interventions

Systemic:

- Policy makers and local business community (in general) are not aware about the scope for biotechnology using genetic resources in Sri Lanka, and the state of the art in this sphere.
- There is poor communication between the business community and the scientific community about the possibilities for business-state collaboration in biotechnology using genetic resources. *[NSF biotechnology Committee can build this link by working with the Chambers of Commerce].*
- There is poor coordination among biotechnology institutions for sharing equipment and expertise.
- There is no specific national policy to develop biotechnology using genetic resources.
- There is no formally established forum for local experts in biotechnology using genetic resources to meet and exchange views and update knowledge (i.e. training projects, overseas exchange visits, etc.).
- Local scientists have few opportunities for interact with foreign scientists working on biotechnology using genetic resources.
- There is lack of awareness within the local industrial sector on biotechnology work done nationally, and the available expertise in state research institutes & universities.

Institutional:

- There is need for a central laboratory (or a few central laboratories with state of art equipment) that can be accessed by research institutions, universities and all biotechnology research workers.
- There are delays in obtaining equipment and chemicals due to administrative and financial procedures causing severe constraints (i.e. especially government tender procedures).

- The AgBiotech Centre specifically needs help to continue functioning, as clients for biotechnological training and applications are infrequent.
- Greater awareness of the potential for biotechnology among the business sector, and providing state incentives to promote such biotechnology applications is required.
- Biotechnological capacity at the VRI requires considerable strengthening for the VRI to act as the main centre for storage of animal germplasm.

Individual:

- Scientists involved in biotechnology using genetic resources need enhancement of:
 - negotiation skills,
 - administrative skills (especially government tender procedures),
 - proposal writing skills, and
 - skills for conceptualizing the work at hand
- Attorneys handling patents lack:
 - Adequate knowledge on legal and IPR requirements for clients working with external country parties or their representatives.

Possible interventions:

- A policy for biotechnology using genetic resources- which takes note of the policy for an ABS regime and the policy for biotechnology - should be undertaken by the Ministry of Science and Technology and the NSF in collaboration with the MOE.
The policy should allow the local private sector to participate in such collaborations.
 - setting up of teams comprising biotechnologists with different expertise from different institutions.
 - establishment of a formal forum where biotechnologists using genetic resources can meet, cooperate and collaborate.
 - formulating formal arrangements (MOUs) for foreign collaborative work on biotechnology using genetic resources.

[suggested: NSF has the capacity to develop the policy, but a directive from the ministry is required as NSF is not a mandated policy making body. The actions to strengthen biotechnology using genetic resources should be identified in the policy].
- The NSF could create awareness on the potential of biotechnology facilities using genetic resources among the business sector through its science popularisation programme.
- The biosafety database (prepared by the biosafety project) should be made available online by modifying it for web hosting. To support capacity of the BDS to carry this out, consider ***linking up with NSF biotechnology committee or the AgBiotech to assist updating the website.***
- The biotechnology 'centres' that are presently functioning without any help of the Government or Universities, and under extremely difficult conditions, should be assisted and developed as centres of excellence. There should be legal officers at the centres of excellence, or a panel of lawyers with the required expertise could be linked with these institutions.
- There should be an apex body to coordinate the centres of excellence and for development, promotion and coordination of biotechnology. Such an Apex body could establish a formal forum for biotechnologists to meet, cooperate and collaborate. The forum could also discuss training projects, overseas exchange visits, other opportunities, etc.). ***[MS&T could address this by incorporating it into their plans for biotechnology development].***
- There should be capacity built for the VRI to act as a centre for storage of animal germplasm with the required infrastructure, equipment and staff training).
[MS&T to collaborate with the Ministry under which the DAPH operates]
- All institutions engaged in biotechnology should be provided legal advice on IPR issues, patents and benefit sharing when there is foreign collaboration.
[The legal advisory panel for the centres of excellence could provide this expertise].
- The Science and Technology Ministry should identify and strengthen selected centres of excellence for biotechnology using genetic material.
 - The MS&T should:

- Make state of the art facilities that are set up at the centres of excellence available for use by industry and other stakeholders.
- strengthen existing biotech centres/institutes (especially those not funded by the state at present).
- Setup bioactivity testing facilities in more than one centre of excellence.
- Establish teams of biotechnologists (with different expertise comprising individual scientists from different institutions) and lawyers with skills in drafting MTAs, patents, IPR, etc.
- setup a legal team to offer legal advice to biotechnicians in centres of excellence and other research agencies to draft MTAs (access agreements with external country parties) for collaborative biotechnology projects, and to deal with IPR issues, rights of inventors and assignees, and related aspects. *(This could be the same legal team set up for the ABS regime at the Focal Point).*
- There should be a mechanism and guidance for other institutions to obtain the services of the centres of excellence with advanced technology, equipment, facilities, etc.

Individual:

- There should be human resources development in biotechnology at all levels once the centres of excellence in biotechnology are established (e.g. graduate/ post graduate to technician/lab attendant level). Training should be provide for:
 - legal officers at centres of excellence on the use of genetic resources in biotechnology.
 - patent attorneys to address IPR issues and biotechnology products relating to genetic resources. *[suggested: FP with Partner organisation (e.g. EFL) can provide the training]*
 - biotechnology workers in research institutions and centres of excellence on legal aspects/IPR, drafting MTA.
 - relevant personnel on benefit sharing and negotiation skills.*[suggested: MOE/BDS/FP on ABS to collaborate with MS&T/NSF, EFL, individual experts on ABS].*
- Exchange visits for local scientists in biotechnology research should be organised with reputed foreign scientists. Scientists working in biotechnology using genetic resources should be provided with: (a) negotiation skills, (b) administrative skills, and (c) proposal writing skills and skills for conceptualizing the work at hand.
[FP once set up for the ABS regime could carry out the training with partner organisations (e.g. NSF biotechnology committee, MS&T and EFL can provide the training. Skills building for negotiation needs special expertise)].

5.5 Establishing an effective inter-institutional coordination mechanism for identification and monitoring of critical components of biodiversity and threats to biodiversity

This is a cross-sectoral issue relevant for all three Rio Conventions.

- Overall priority capacity needs for and possible interventions

Systemic

- A coordination mechanism is required to report threats to biodiversity from the field to the FD, DWLC, MPPA and DOA/SSPPC.

Institutional

- Once a coordination mechanism is established, field and regional staff in the CCD (Coastguard division, regional and field staff), DFAR and MFAR (fisheries inspectors, fisheries coordinating committees), CEA (Divisional Environmental Officers), UDA (regional staff) Department of Ayurveda and other relevant institutions as well as NGOs with field presence can assist with monitoring threats to biodiversity. These departments could report threats to the DWLC, FD and DOA.

Possible interventions:

Institutional

- The BDS/MOE should address this issue via a Task Force on *in-situ* and *ex-situ* conservation.
- FD, DWLC, CEA and DOA could take lead role to institutionalise a simple system of reporting perceived threats to biodiversity by the field staff in their departments.
[This does not need additional funds].

Individual

- Training field staff in FD, DWLC, CEA, and DOA and national NGOs with field presence to build skills for:
 - identification of species to report critical and threatened components of biodiversity and perceived threats.
 - identification of important/endemic and invasive plants by building para taxonomic skills.
 - preserving species to be sent to the relevant institutions for further identification.
 - obtaining spatial information using GPSs.
 - Identification of alien species on a case by case basis.***[This needs additional funding for the training programmes. National NGOs - especially those with field presence could assist with organising the training but would need funds to prepare the training materials].***
- FD, DWLC and National Museum staff should be specially trained in:
Scientific field surveys, use of GPS, identification, data entry, database development, taxonomy, preservation of specimens, labeling, report writing, writing scientific papers, communication and education, proposal writing and monitoring and evaluation of activities and educational activities.
[BDS/MOE to facilitate action for capacity building within the national museums department via a Task Force on in-situ and ex-situ conservation].

5.6 Promoting biodiversity information management and exchange

This is a cross-sectoral issue relevant for all three Rio Conventions.

● Overall priority capacity needs and possible interventions

Systemic:

- There is no national policy on biodiversity information management, and no national policy for access to GIS information in the country.
- Accessing biodiversity information in custodial institutions is difficult because custodial institutions are not sure whether the information is publicly held and could be given out freely.
- Information safety and IPR issues are poorly known and not adequately addressed at the national level.
- There is no central meta-database which provides information on where biodiversity data can be accessed.
- All publications and journals are not customarily sent to the national archives and the national library as there is no law or policy which makes this a requirement.
- Resource managers and policy makers do not get timely information on biodiversity in a useable form to make sound decisions for biodiversity management.

Institutional:

- There is no central national body responsible to provide and distribute biodiversity information (particularly information from COP to the CBD).
- Most custodial institutions lack human resources (in terms of numbers and personnel with skills) and funds to establish and maintain computerised databases, and have very limited means to collect information from original data sources/repositories. Some institutions lack relevant IT facilities (e.g. LAN).

- Databases in biodiversity information custodial institutions that were developed through project funds are not regularly updated and managed after the projects end, due to insufficient funds and staffing (i.e. databases are often set up and managed by project staff who are not absorbed into the permanent cadre).
- Custodial institutions have data in various forms. (e.g. herbarium sheets, specimens, etc).
- NGOs lack funds to obtain up-to-date publications on biodiversity. They also lack funds, equipment and infrastructure for easy internet access. Many rely as yet on telephone calls for networking.
- There is no transparency for information sharing between the different divisions of a single institution. This is partly due to poor research ethics and the threat of data plagiarism.
- There is no regular mechanism or institutional policy for sharing published information within custodial institutions.
- Sound procedures for database designing, management, upgrading and updating data are absent or deficient in many institutions.
- Capacity building through partnerships between organisations (between both inter and cross-sectoral institutions) is greatly under-utilised for organising and disseminating biodiversity information.

Individual:

- The main problem for local scientists and biodiversity managers is accessing information that is not available in the public domain from external country sources.
- Infrastructure, equipment, IT facilities and funds are not adequate in most institutions (especially for NGOs) and for individual scientists to access information from external sources through the internet.
- The issue of restricted access to information is also not very well understood among institutions and individuals.
- Database managers in custodial institutions often do not get the required support from the top institutional management, partly because databases management is under-valued.
- The staff managing databases require training on data collation, management and dissemination in customised formats and for communication and writing.
- Database managers have little knowledge of the legal aspects of information dissemination (patent rights, disclosed and undisclosed information, etc.).
- Officers in custodial institutions lack capacity to identify information in the public domain, and what is not.

Possible major interventions:

[GEF funds should be sought for a major multi-institutional capacity building initiative].

Systemic:

- There should be a National Policy on access to biodiversity information (from both internal and external sources).
- A Steering Committee on Biodiversity Information should be established at the Biodiversity Secretariat to formulate the necessary policies, establish the required institutional networks and centres, monitor and strengthen capacity for biodiversity database management and dissemination within custodial institutions, and facilitate the CBD clearing house mechanism and improve access to biodiversity information from external country sources. This committee should have adequate mandate and power to address information retrieval from international databases. NSF, CARP, CEA and a legal expert should be part of this Committee.

Institutional

- 'Centres of Excellence' should be set up for biodiversity information and to act as web portals/gateways [*Suggested: at NSF/CEA/CARP*] to enable local researchers/scientists to access biodiversity information through these gateways.
- Key custodial institutions should be identified as centres for various types of data (e.g. FD, DWLC, CCD, PGRC, CEA, CARP, NSF; CEA). Each institution should:
 - develop an institutional policy for data sharing based on various client categories.
 - formulate criteria to provide access to information for different categories of users.
 - setup online nominal payment systems according to different categories of users.
- All biodiversity related databases should be linked to a central biodiversity meta-database to be set up at the Biodiversity Secretariat of the MOE. [*This needs funds and human resources for the BDS*].
- Links should be established with the "Vidatha programme" and the CEA Regional and Sub-regional centres to form a network to enhance access to external (and internal) biodiversity related information at the remote regional levels. [*This needs collaboration by BDS/MOE with the Ministry of Science and Technology and NSF*].

Individual:

- Staff training should be provided at institutional level for data collation techniques, developing questionnaires to extract specific information, entering different kinds of data that are specific to the individual institution.
- Database managers should be trained in public relations and communication skills, negotiation skills for benefit sharing, and IPR and legal aspects of information (patent rights - on information, disclosed and undisclosed information, etc.) and special software operating systems for database management.

5.7 Implementing a multi-institutional coordinated effort to identify, design and establish a rational network of areas needing protection in accordance with the ecosystem approach.

This is a cross-sectoral issue relevant for all three Rio Conventions.

● Overall priority capacity needs and possible interventions

Systemic:

- There is no policy to guide the declaration of areas for protection by the various agencies mandated to do so in accordance with the ecosystem approach.
- There are no policy guidelines for the FD to follow to declare urban forests.
- There are no national criteria for identification of areas requiring protection by the various institutions that have a mandate to declare legally protected areas, other reserves and environmentally sensitive biodiversity rich sites.
- Protected areas are currently not declared with the concurrence of local people, which jeopardizes their subsequent management in accordance with the ecosystem approach.
- There is no nationally accepted approach for pragmatic zoning of areas with high conservation value for controlled resource use management, development and strict conservation.

Institutional:

- There is no coordinating body to take the lead on identification and establishment of a network of areas that require protection of biodiversity.
- Except for the FD, DOA, and DWLC (capacity is now being built for the latter), the required capacity to effectively mobilise public participation for a major consultative process to declare areas for conservation and management (from grassroots to regional and central levels) is absent in most other institutions.
- FD and DWLC are constrained in identifying and managing protected areas because critically essential wildlife corridors between protected areas under their jurisdiction are owned by other institutions (e.g. UDA, Plantations, LRC) or are under private ownership.

- Institutions and individuals managing protected areas are not in sufficient contact or exchanging knowledge and experiences with appropriate peers in other institutions.

Individual:

- Individuals at provincial, regional, and local levels (including communities) do not have adequate skills to adopt the ecosystem approach for identifying and managing areas of high biodiversity conservation and sustainable use.
- Individuals in most state institutions responsible for the management of protected areas do not have adequate skills to effectively mobilise provincial, regional and local level support for identification of areas for protection.
- Individuals in the BDS require assistance to coordinate a major national exercise for identification of a rational network of areas for protection in Sri Lanka.

Possible interventions:

[GEF funds could be sought to build capacity through a major multi-institutional initiative to identify, establish and monitor a rational network of areas for protection in accordance with the Ecosystem Approach].

- A major project or programme is necessary to establish the necessary inter-institutional forum to identify a rational network of areas needing protection. This should address:
 - The formulation of an overarching policy to govern the declaration of areas for protection by different institutions, under various ministries, that are governed by various environmental laws. This policy should identify the process for selection of such areas, the national forum for deciding on the areas/sites, and a coordinating agency to facilitate and coordinate the entire process.
 - A strong coordination mechanism (a formal forum) is required to drive the policy formulation and implementation process. This forum should bring all stakeholders together to identify an optimal network of areas for protection, and should have representation from scientists and institutions that would manage the areas identified for protection, as well as other stakeholders (at regional and grassroots level) whose cooperation is vital to operationalise the network of areas for protection.
 - The forum to be set up should establish the mechanism to:
 - identify criteria to be used for site selection,
 - receive and consider areas recommended for protection from provincial and local administrators and communities as well as from institutions (based on scientific data).
 - receive inputs from scientists/resource managers for zoning the selected areas and to identify areas for strict protection.

[It has been suggested that the BDS should be the coordinating body for this exercise, but as it lacks capacity (funds and human resources) to convene the forum, a partnership arrangement with other agencies is desired. The National MAB Committee can help facilitate the process by initiating the process by holding a preliminary meeting to identify:

- *all stakeholders (at provincial, regional and local levels) for a formal national forum to implement this process.*
- *identify existing datasets that can be used for site selection].*

5.8 Institutionalising participatory and integrated *in-situ* conservation and management of ecosystems as consonant with the ecosystem approach and poverty eradication

This is a cross-sectoral capacity need for two Rio Conventions.

● Overall priority capacity needs and possible interventions

Systemic:

- The NEA lacks the authority of the FO and FFPO for site protection in environmental Protection Areas declared by the CEA.

Institutional:

- Both FD and DWLC have inadequate capacity (i.e. mainly funds for the FD, funds and trained staff for the DWLC) to institutionalise the piloted approaches by extending it to all areas under their jurisdiction. Other agencies such as the CCD, DFAR and CEA lack overall institutional capacity for habitat and resource management with the participation of local communities and local/district/regional administration.
- State institutions depend heavily on external donor funding for social mobilisation which is a requisite for adopting a participatory approach to protected area management. This is a main impediment for limiting wider application of this approach in the FD.
- Most institutions managing protected areas and resource management areas have not been able to adequately demonstrate tangible benefits to local people. This has curtailed community cooperation for the sustainability of these programmes and these areas.
- Divided institutional responsibilities preclude the application of integrated management of ecosystems and implementation of management plans due to poor institutional capacity for coordination.
- The experience gained by the FD for participatory management has not been utilized at the national level for capacity building in other state institutions.

Individual:

- Resource managers (other than at the FD, and now possibly at DWLC) lack capacity for managing areas requiring protection. These capacity constraints are variously legal issues (i.e. lack of legal standing for CEA officials when compared with field staff of the FD and DWLC) and training for effective participatory resource management and community mobilisation (in the CCD, DFAR and CEA).
- Many stakeholders at the provincial, district and local levels associated with protected areas do not understand their values/importance and the management concepts. *This requires awareness programmes and social mobilization at provincial, district and local levels.*
- Capacity is lacking among staff of most institutions to build an environmentally sensitive constituency capable of pressurising political will to favour conservation and sustainable use of biodiversity.
- Ecosystem managers (e.g. managers of protected areas, fisheries management reserves, SAM sites, etc.) need skills for effective social mobilisation to build ownership for conservation of these areas and their resources at grassroots levels.

Possible interventions:

[GEF funding should be explored for a major multi-institutional, multi-stakeholder capacity building programme]

- There are similar problems for adopting the participatory management approaches for integrated management of biodiversity as consonant with the Ecosystem Approach in almost all institutions responsible for managing biodiversity - except the FD. Hence a comprehensive integrated initiative is required to jointly train field officers in several institutions (e.g. DWLC, FD, CEA, CCD, DOA/HORDI, DFAR, NARA and possibly UDA) at various sites, with the final objective of conservation and sustainable use of biodiversity. Each site should be used to train more staff from the respective institutions:
 - Funding is required to initiate a joint inter-institutional project for the FD to build capacity by extending the ongoing AUSAID funded Training of Trainers programme to pilot sites managed by the DWLC, CCD, CEA, DFAR, DOA, and NARA (for community outreach areas where NARA is active), and for selected NGOs with grassroots presence.
 - Divisional Secretaries and community members should be given opportunities for study tours overseas through the participatory management project. *(This has proved to be a successful method of obtaining the required awareness and cooperation from regional and local*

administrators and communities, as seen through the CRMP project (source: Stock take baseline survey).

[The FD could extend the 5-module Training of Trainers programme now being pilot tested under the Sri Lanka Australia Natural Resources Management Project (SLANRMP) to selected pilot sites managed by the DWLC, CCD, CEA, DFAR and DOA/HORDI, NARA and selected NGOs with field presence. This being a continuous training of trainers programme at field level, the trained officers would be required to further train others at the respective sites for continuity of the programme. This requires initial funding to establish social mobilisation at the various pilot sites. Curriculum development can be funded by the FD.]

This could be initiated by the MOE/NSF/MAB committee by bringing together all relevant participants at a workshop to share experiences and for identification of a suitable mechanism for preparation of a project proposal to seek funds for the above multi-institutional capacity building programme].

- Community outreach training should be incorporated into the institutional training programmes of the FD and DWLC for **joint training** programmes. Special courses could be offered to site managers in the CCD, DFAR, NARA, DOA through institutional arrangements by the FD and DWLC.

[This component does not need additional funds and human resources, but could be carried out with existing institutional allocations]

5.9 Enhancing institutional capacity to design, develop and implement multi-stakeholder participation for species specific *in-situ* and *ex-situ* conservation measures to promote conservation, management and recovery of threatened species and sustainable use of commercially important species.

● **Overall priority capacity needs and possible interventions**

- There is need for better communication and coordination between *in-situ* and *ex-situ* conservation institutions. Clear decisions on the species to be conserved by *ex-situ* means should be taken by institutions such as PGRC, NARA, National Botanical Gardens (NBG), and National Zoological Gardens (NZG) in collaboration with the relevant *in-situ* conservation institutions (FD and DWLC).
- The National Zoological Gardens (NZG) is unable to serve as a repository of indigenous wild animal species for *ex-situ* conservation as warranted by its mandate due to various capacity constraints (i.e. funds from the national budget, space, infrastructure and expertise to guide rehabilitation and where appropriate reintroduction of captive bred/reared protected species to their natural environments). Acute space limitations preclude critically important management practices.
- There is haphazard release of sub-species due to the lack of a formal mechanism to consult species specific experts. This can affect the wild populations.
- There is no state institution to serve as a repository of faunal germplasm with adequate infrastructure and equipment (although capacity building within the VRI has been proposed in the BCAP in 1999). On the other hand, existing facilities in research institutions (e.g. Agbiotech) are underutilized.
- NARA is mandated with research on coastal and marine biodiversity to support conservation of threatened species, particularly marine mammals, and captive breeding of threatened ornamental fish and aquatic plants, but has inadequate capacity (i.e. special unit, infrastructure, staff with expertise and funds) for focused research on coastal and marine biodiversity (except for coral reef biodiversity).
- The relevant state institutions responsible for *in-situ* conservation of biodiversity do not have the required capacity (funds, trained people and expertise) to implement the species

conservation strategies/plans and recovery plans now being prepared by the MOE/BDS and the National Species Conservation Advisory Group (NSCAG).

- Some species require collaboration from the local community for *in-situ* and ex-situ conservation. This requires training and social mobilisation.

Individual:

- NBS & NZG staff and FD and DWLC field staff need species specific training to contribute meaningfully towards *ex-situ* conservation of threatened species (both fauna and flora) identified under the species recovery plans and conservation strategies.
- There is inadequate coordination and exchange of expertise between the DWLC and FD for species conservation. Collaborative initiatives between the two departments should focus on species targeted in the species recovery plans and species conservation action plans developed by MOE/BDS.

Possible major Interventions:

- There should be a policy to promote *ex-situ* conservation of threatened species with multi-sectoral collaboration (including collaboration of the private sector with the required checks and balances). *[This could be facilitated by a Task Force for in-situ and ex-situ conservation set up by the BDS to implement the BCAP].*
- A multi-species expert/advisory committee for *ex-situ* conservation, captive breeding, rehabilitation and reintroduction should be convened under the NZG. This Committee should have persons with specific expertise on behaviour and ecology of threatened taxa in the national threatened list to help with captive rearing and breeding, and to provide advice on identification of sub-species for reintroduction programmes. *[This could be facilitated by a Task Force for in-situ and ex-situ conservation set up by the BDS to implement the BCAP].*
- Training courses should be provided on behavioural ecology for staff in the FD, DWLC and NZG at post graduate level and for other students at the degree level *[the Open University could establish short term professional courses]*.
- Curriculum development should be carried out for training on species conservation measures (with the help of species conservation experts) in the DWLC and FD training institutes. Closer collaboration between the two departments in respect of future training in this area is desired. The possibility of extending the training courses to NZG and NBS staff (and drawing resource persons from these institutions) should be explored.
- Capacity for *ex-situ* conservation and sustainable use could be promoted among the relevant state institutions, communities and the ornamental fish and aquatic plant exporters through a major project. The collectors could provide information on the environmental conditions for the species, the technology could be provided by NARA and the NZG, and reintroduction can be monitored by the DWLC. This way the exporters obtain an uninterrupted supply of the resource and communities (which comprise the collectors) are provided with the technology for breeding and support in marketing. This leads to sustainable use and conservation of the wild resources. *[This type of activity can also be built into a project for Training of Trainers (for livelihood development) in participatory management of natural resources under 5.8].*
[GEF funding for small grants should be explored for this activity to build capacity among communities and business sector].

5.10 Negotiating to fulfil national needs for biodiversity conservation and sustainable use at CBD COP and other global fora.

This is a cross-sectoral capacity need for all three Rio Conventions.

● Overall priority capacity needs and possible interventions

- Capacity for dissemination of outcomes from CBD COP is limited to the National Experts Committee and this information does not go beyond a limited number of people. The BDS lacks capacity at present to make this information more widely available due to the dearth of (a) funds for organising a wider forum, and (b) junior and mid level staff with skills for preparing customized communication materials and reports.
- Sri Lanka benefits little through the Clearing House Mechanism established under the CBD, and very few local scientists and others (at best) benefit through it. Although the CHM is operational through the web, this is not freely accessible for most Individual Sri Lankans due to the high cost of surfing the net.
- Individuals who represent Sri Lanka at CBD COP meetings would greatly benefit from skills building for advocacy and to negotiate beneficial terms at COPs.

Possible interventions:

- In view of constraints in terms of funds and human resources in the BDS, partnerships should be explored for expanding the clearing house mechanism within the country. The International Liaison Division (ILD) of the NSF can assist the BDS in this regard (*source: outcome of roundtable meeting on in-situ and ex-situ conservation*). The ILD could assist the Sri Lanka representative to be better prepared for negotiation at CBD COP meetings (by organising pre-departure briefings from relevant experts) and help with dissemination of COP decisions and deliberations to the wider scientific community and the general public.
- Through the NSF/ILD and the MOE Global Affairs/BDS partnership there should be the development of fora to involve and build capacity among relevant stakeholders and to get their participation at the national level for fulfilling obligations under the CBD.
- External Resources Department and the Foreign Ministry are represented in the ILD of NSF, so that the problem of funds for Sri Lanka's participation at COPs could also be addressed at this level. The MOE/Global Affairs Division is already represented in the ILD. Where possible funding could be sought for a second person with expertise in key topics for discussion to attend the meetings with the MOE representative (*especially relevant when matters of top national interest which needs specific technical expertise such as legal, biotechnology, etc. are to be deliberated at the COP*).
- The opportunities for side events at COP meetings should be made available more widely and to the scientific and NGO community to enable them to seek funds and attend these fora.

[Suggested: A relevant mechanism should be set up by MOE GA/BDS and NSF/ILD. This can be expanded to cover all three Rio Conventions. NSF/ILD could set up a briefing meeting of the Sri Lanka representative/participant, with relevant experts, prior to departure. On the return of the delegate, NSF/ILD in collaboration with the MOE could organise a seminar or meeting to disseminate the COP deliberations to a wider audience than at present. Where relevant salient actions could be relegated to the relevant NSF research committees. This could also influence priorities for research funding at the national level. Important decisions could also be communicated to the public through SLAAS.]

5.11 Enhancing efforts for communication, education and public awareness on the importance of biodiversity for sustainable development to mobilize commitment and participation for biodiversity conservation

This is a cross-sectoral issue for all three Rio Conventions.

- **Overall priority capacity needs and possible interventions to enhance communication, education and public awareness.**
 - A comprehensive biodiversity communication, education and public awareness plan should be prepared for the country and implemented by the MOE. This should cover :
 - Skills building for biodiversity planning to be supported by a more effective consultative process to build firm commitments among stakeholders who have to implement recommendations in the relevant plans and programmes.
 - Training state sector extension/education officers and NGOs working with schools on activity based participatory education methods.
 - Strengthening capacity for non-formal biodiversity education within state and NGO agencies.
 - Establishing a regular mechanism for awareness creation among policymakers.
 - Capacity building among media personal for effective and quality environmental reporting and public education, by:
 - initiating accredited training courses/degree courses on environmental journalism for media personal.
 - Providing incentives for quality environmental reporting (award schemes).
 - establishing effective mechanisms to enlist the support of media institutions for more responsible reporting on biodiversity issues.
 - Inculcating participatory activity based environmental education into the teacher training curricula and training appropriate teacher trainers to impart these skills.
 - Setting up a mobile biodiversity education and communication unit at the BDS/MOE to provide customised awareness programmes for different stakeholders.
 - The BDS should formulate links with the CBD/CEC initiative on Communication, Education and Public Awareness (CEPA).
- [Suggested: NSF/MAB could support this process].**
- Enhancing overall written communication skills, letter writing for consultative meetings, report preparation, editing and proposal writing.

Major Capacity Needs at in Key Institutions Responsible for Biodiversity Conservation:

In addition, capacity needs for participating in biodiversity conservation and sustainable use by the Biodiversity Secretariat and main linkage institutions that are responsible for biodiversity conservation in forests and other wildlife habitats, wetlands, coastal and marine systems and agricultural systems were assessed through institutional dialogue and discussions with donor funded projects for capacity building in these institutions. The capacity built through major initiatives in the past, existing coordination mechanisms and problems at regional and local level for biodiversity conservation were also reviewed (Chapter 4 of this report and the Baseline Survey Report).

● Overall thematic summary assessment of functions required to comply with the obligations under the CBD:

This summary stems from analysis of institutional strengths, previous capacity building efforts (in the baseline survey) and identified capacity required to fulfil obligations under the prioritised areas through personal interviews, mini-workshops, roundtables and community level meetings

Functions	Status of capacity	Comments
Conceptualise and formulate policies, legislation, strategies and programmes.	Overall Low	There are a limited number of individuals with the necessary ability for formulation of policies and plans. Their contribution is not always sought, nor are they always available when required.
Analyse global, regional and national socio-economic conditions.	Medium	As above.
Visualise and develop long-term strategies.	Low	As above.
Formulate sectoral and cross-sectoral policies.	Low	As above
Prioritise plan and formulate effective policies and programmes.	Low	The requirements at various stages of cycle of policy/plan preparation are not well understood. Insufficient inputs are made at the initial stage to identify the goals, objectives and the structure of the final policy or plan. Consequently, the preparatory stages for plan preparation do not provide adequate support for the subsequent drafting and fleshing out of the final plan. This delays plan preparation considerably. There is poor perception of the requirements (data, structure and consultative inputs) until the plan is being drafted.
Ability to gain consensus and cooperation through coordination.	Very low	There is inadequate attention given to consensus building as part of a policy or planning cycle although many consultations are held. This is because consultations are held more as a routine requirement than with genuine intent to gain the cooperation of stakeholders to participate in the preparation and implementation of policies and plans.

Functions	Status of capacity	Comments
Mobilise and manage human resources	Low	Capacity to develop and retain relevant human expertise (especially trained young staff) and professionals within the relevant state institutions dealing with biodiversity conservation and management ranges from very low to adequate (in a few institutions), but is low overall. There is medium capacity to use the available in-country expertise for biodiversity conservation.
Benefit from capacity building donor funded projects	Medium	Capacity ranges from very low to adequate, but is medium overall ¹ . Much of the problems are due to poor human resource mobilisation at the inception and capacity building among institutional staff for project implementation and over reliance on hired project staff. This results in capacity depletion for the work at hand when the project ceases.
Mobilise and manage financial resources	Medium	The accounting systems are in place, but innovative mobilisation of funds ranges from poor to adequate.
Execute and manage programmes and projects effectively	Medium	Capacity is present to track physical progress, but managerial ability to guide the process with technical inputs and to monitor achieving qualitative targets is low. In most cases qualitative targets are not identified.
Select effective technologies and infrastructure	Adequate	Technical capacity exists in most institutions to identify technologies and infrastructure that is required.
Mobilise information and knowledge	Overall low	There is little effort taken to identify where information exists and to establish the collaboration required for data and knowledge sharing. Even when data exist, there is poor impetus overall among individuals to gain knowledge about a particular issue.
Gather, analyse and synthesise information	Low	Capacity for gathering information is medium, but capacity for analysis and synthesis of information is very low.
Identify problems and potential solutions	Low	Individuals have capacity, but the results of evaluations are not publicly available to ensure that such problems are not repeated and that solutions are reached. This results in low accountability.
Monitor and measure progress	Low	Progress is often measured in terms of physical targets such as infrastructure, databases, reports etc, but there is

¹ From the NCSA biodiversity thematic questionnaire survey on capacity building projects to support biodiversity conservation at the national level.

Functions	Status of capacity	Comments
		no monitoring or assessment of quality of the outcomes vs. objectives and monies spent.
Monitor evaluate report and learn and distribute lessons learnt	Very low	There is a tendency to re-invent the wheel which is a drain on human resources, funds and time. Further, often physical targets are monitored, not the quality of outputs against, implementation objectives
Use the lessons learnt for policy dialogue and planning	Very low	Plans and reports prepared in the past are hardly used for further policy dialogue and planning. Policy makers are unaware of past lessons in a productive manner.
Report to donors and global conventions	Adequate	Available capacity in the country is mobilised to fulfil this need.
Develop and strengthen necessary institutional mechanisms, mandates, jurisdictions and competencies	Medium	Medium capacity exists at central level and low capacity at decentralised level.
Establish and maintain infrastructure and equipment for effective biodiversity conservation.	Medium	Capacity to establish infrastructure with donor funding is adequate overall, ability to maintain infrastructure once established is adequate in agencies responsible for conservation, but there is insufficient in-country funding for infrastructure development.
Maximise benefits from donor funded capacity building projects and to learn from earlier experiences.	Medium	Medium benefits have been received from most previous capacity building efforts. Also ability to learn and build on earlier experiences is low.

Chapter 1

INTRODUCTION

1.1 Objectives of the NCSA project

The National Capacity-needs Self-Assessment (NCSA) Project for Global Environmental Management is carried out by the Ministry of Environment. It has identified capacity development needs to fulfil obligations for three United Nations conventions, namely: the Convention on Biological Diversity (UNCBD), The Framework Convention on Climate Change (UNFCCC) and the Convention on Combating Desertification (UNCCD). The latter (UNCCD) includes combating land degradation. It is envisaged that fulfilling national obligations for these Conventions will help protect the globally significant environment in Sri Lanka. The NCSA project is expected to be country-driven and consultative, and to explore synergies among and across the requirements of the above mentioned three conventions.

1.2 The NCSA biodiversity thematic assessment

● Goal

To identify priority capacity building needs at the systemic, institutional and individual levels for implementing the CBD in Sri Lanka to fulfil national obligations.

● Objectives

- To develop a clear understanding of the requirements under the CBD.
- To review what has been done at the national level to address obligations under the CBD and to take advantage of convention-related opportunities as a signatory country.
- To assess country performance strengths and weaknesses to address convention requirements and to benefit from participation under the CBD.
- To identify priority capacity needs and opportunities for capacity development to fulfil obligations under the CBD, at the individual, institutional and systemic levels.

The NCSA project has identified two basic components for the Thematic Assessments:

1. the inventory of convention provisions (given in the convention text and decisions of Conference of Parties) and analysis of country obligations (this helps identify the degree to which the obligation is binding in the country), and
2. the assessments and needs and opportunities for capacity development under each convention.

BOX 1.1:

The different stages of the NCSA

- The Stock-taking is a neutral, descriptive process. The output is a general description of the entire situation;
- The Thematic Assessment is an analytical process, leading to understanding, but not leading to recommendations. For practical reasons, it must focus, and it is necessary to set priorities before the thematic assessment. The Output is a detailed understanding of the capacity situation in priority areas (likewise, the cross-cutting assessment is an analytical process);
- The Action Plan is a planning process. Through this process, detailed understanding is transformed into recommended measures.

(Source: National Capacity Self-Assessment Resource Kit, Global Support Programme, 2005)

The analysis is expected to identify the convention requirements that are not met with and those that are partly but insufficiently met with, and those that have not been met with at all, and to identify the main barriers to meeting these requirements and the underlying causes. This is expected to lead to a complete understanding of the nature of national capacity needs, constraints and opportunities, and the identification of optimal capacity intervention points for best impact.

The thematic assessment is, therefore, not only expected to identify constraints and needs and the negative aspects of convention participation, but also to identify in country strengths to respond to the convention, give credit to those who are responsible, and identify success the country can build on.

The biodiversity thematic assessment seeks to provide a picture of where the country is now in relation to implementing the CBD, and to identify possible Capacity Development Actions that could be addressed in the Capacity Development Action Plan.

● Capacity assessment levels

The NCSA project operates on the premise that if the country has the *appropriate* individuals, working effectively in the *appropriate* institutions, within the *appropriate* system, then it will be able to perform all the necessary functions and so meet its requirements under the Convention.

The NCSA Resource Kit of which was provided as a guide for the process by UNDP/GEF defines *Capacity* broadly as the ability of individuals, institutions and broader systems to *perform* their functions effectively, efficiently and in a sustainable way. Thus '*Capacity Development*' as defined for the NCSA is the process by which individuals, institutions and social systems increase their capacities and performance in relation to meeting each of the requirements under the Three Rio Conventions. In this sense, capacity development identified through the NCSA process should directly increase ability to meet national obligations under these three Conventions.

The NCSA project also requires that the various needs to fulfill the Conventions be grouped as requirements for:

- organizing and formulating policies, legislations, strategies and programmes;
- implementing and enforcing policies, legislations and strategies, often through projects;
- notably by mobilising and managing all required resources;
- building consensus and partnerships among all stakeholders;
- mobilizing information and knowledge;
- monitoring, evaluating, reporting and learning.

The present thematic assessment on biodiversity was carried out taking into consideration these concepts, needs and requirements, and where relevant at the three levels of individuals, institutions and broader systems.

1.3 Analysis of CBD articles

The Convention on Biological Diversity (CBD) was opened for signature on 5 June 1992, and entered into force on 29 December 1993. Currently 188 Parties have ratified it, making it one of the most widely adopted environmental treaties of all times.

Sri Lanka ratified the CBD on 23rd March 1994. The national focal point for this Convention is the Ministry of Environment. This report comprises the *thematic assessment on National Capacity-needs* to fulfill national obligations for the Convention on Biological Diversity (CBD), and accordingly to protect and use the country's rich biological diversity in a sustainable manner.

The CBD, as a legally binding treaty, seeks to address the varied problems of global biodiversity loss, by preserving the diversity of life forms through conservation and sustainable use. It also contributes to the overall objective of sustainable development and supporting the achievement of the Millennium Development Goals (MDGs). In doing so the CBD takes particular note of the difficulties of developing countries to conserve biological diversity and obtain equitable benefits from its components. However, the legal aspects regarding Articles 15, 26 and 19 remain grey areas as the Convention also strives to address the Intellectual Property Rights concerns of its developed

country Parties. Hence the actual situation with regards the transfer of modern bio-technologies by users of biological resources to countries providing such bio-resources - though promoted by the Convention - remains vague and ambiguous and open to varied interpretations.

BOX 1.2

Biological diversity

Biological diversity - or biodiversity as known by its contracted form - means the variety of life on Earth, including plants, animals and micro-organisms, as well as the ecosystems of which they are a part of as defined in Article 2 of the Convention on Biological Diversity. Consequently biodiversity covers genetic differences within species, the diversity of species and the variety of ecosystems on Earth. The CBD underscores that this combination of ecosystems, species and genetic varieties are what makes the Earth habitable to humans and other life forms, and also provide the goods and services to sustain human survival. Biodiversity also comprises an important part of human cultures, which have been, and sometimes still are, greatly influenced by the different natural environments in which they evolved. The provisions of the CBD reflect a global concern that biodiversity is currently being lost at unprecedented rates due to human actions, and that this has caused degradation or loss of habitats, pollution, accelerated climate change, land degradation and loss of cultural degradation due to the loss of traditional knowledge associated with the use of bio-resources.

Parties to the CBD have committed themselves, in general terms, to undertake national and international measures aimed at achieving its three explicit objectives set out in Article 1. They are:

1. conservation of biodiversity,
2. sustainable use of the components of biodiversity, and
3. fair and equitable sharing of benefits arising out of the utilisation of genetic diversity, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Through its three objectives, the CBD seeks to provide a comprehensive and holistic approach to the conservation of biological diversity. The scope of the convention has been broadened to include *in-situ* and *ex-situ* conservation of both wild and domesticated species; permitting sustainable use of biological resources; providing access to genetic resources and relevant technologies (including modern biotechnology) and access to benefits from providing of such resources, including technology transfer; enabling biosafety; and facilitating financial support to conserve biodiversity.

The CBD focuses on seven (7) thematic programs, namely: (1) agricultural biodiversity; (2) biodiversity of inland waters; (3) biodiversity of dry and subhumid lands; (4) forest biodiversity; (5) marine and coastal biodiversity; (6) mountain biodiversity; and (7) island biodiversity. It also includes among its concerns relevant issues that cut across the seven programs: e.g., plant conservation, invasive alien species, intellectual property rights, traditional knowledge, biosafety, access to genetic resources and taxonomy. The Cartagena Protocol is a spin off of the CBD (Article 19). This deals with biosafety obligations among parties, especially when there are transboundary movements of genetically modified organisms (GMOs).

A noteworthy feature of the CBD is that it goes beyond a commitment for conservation of biodiversity *per se*, or a commitment for sustainable use of biological resources, as it covers issues such as equitable sharing of benefits from the use of biological diversity - including genetic material - and access to information and technology.

To facilitate achieving the three objectives of the CBD, the Conference of Parties (COP 2) decided that the ecosystem approach should be the primary framework of action to be taken under the CBD. This approach, defined and adopted at COP 5, is in essence a **generic strategy for integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable manner**. The COP is encouraging the provision of technical and financial support for capacity building among Parties for its adoption, especially through the Global Environmental Facility (GEF).

The CBD however:

- (a) leaves much to the individual parties to determine how its provisions are implemented. The provisions are set out as goals and policies, rather than as definite obligations (i.e. as in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)), and
- (b) sets no definite targets and time frames to achieve results as in some other conventions and protocols. This in one sense gives flexibility for Parties to interpret its obligations.

It also builds on other Conventions such as CITES, BONN, Ramsar and the World Heritage Conventions (given in Annex 2 of baseline report) that were prevailing at the time of its drafting. However, unlike them, the CBD takes a comprehensive approach to conservation of biological diversity rather than a sectoral approach, and is hence considered a landmark in the field of environmental conservation and development.

The Strategic Plan for the CBD adopted at the sixth meeting of the Conference of the Parties (COP 6) commits its Parties to a "more effective and coherent implementation of the three objectives of the Convention". They have thereby agreed to achieve a significant reduction of the current rate of biodiversity loss at the global, regional and national levels by 2010 as a contribution to poverty alleviation and to the benefit of all life on earth. This "2010 biodiversity target" has been confirmed by The World Summit on Sustainable Development (WSSD), held in 2002 to review progress made since the Earth Summit, which reaffirmed that biodiversity plays a critical role in overall sustainable development and poverty eradication.

The World Summit also has reiterated that the Convention on Biological Diversity "is the key instrument for the conservation and sustainable use of biodiversity and the fair and equitable sharing of benefits". Consequently, the CBD is today considered the main international instrument for addressing biodiversity issues as it provides a comprehensive and holistic approach to the conservation of biological diversity.

Resolution 57/260 of 20th December 2002, adopted by the United Nations General Assembly at its fifty-seventh session, has also invited the CBD COP to take appropriate steps with regard to the commitment made at the World Summit on Sustainable Development "to negotiate within the framework of the convention on biological diversity, an international regime to promote and safeguard the fair and equitable sharing of benefits arising out of the utilisation of genetic resources, bearing in mind the Bonn Guidelines."

The salient feature of the CBD is that it brings together the commitment of each Contracting Party for the conservation of biological diversity and the sustainable use of its components at the national level and for dealing with other Parties to the Convention. It is this collective commitment that will contribute and lead towards the global biodiversity conservation agenda outlined by the CBD. However, as the CBD leaves individual Parties the right to determine how most of the provisions are implemented within its broad provisions, the main thrust of the decision making for implementing the CBD is left at the national level. Hence enhancing national capacity to implement the Articles of the CBD is of paramount importance to fulfil the objectives of the CBD.

● Legal aspects of the CBD

The CBD acknowledges that conservation of biodiversity is a "common concern" of humankind, but does not promote the concept that biological diversity is a "common heritage" of humankind by recognising that most components of biological diversity are in areas under national jurisdiction (Glowka, *et al.*, 1994).

BOX 1.3

Rights over genetic resources as in the CBD

Article 1 states that both access to genetic resources and the transfer of technologies shall “take in to account all rights over these resources and technologies”. The rights and obligations in all the other articles of the convention are to be interpreted in accordance with the affirmations in the objectives. Hence this statement has to be considered as part of the basis that is used in the explanation and understanding of the convention, and to resolve any seeming ambiguities in other articles.

The rights over genetic resources mean not only rights conferred by national laws, the convention, and by tradition, but include the intellectual property rights (also patent and plant breeders rights) that can be taken to cover them. The rights over technologies mean the intellectual property rights (patent and undisclosed information) that are meant to prevent competitive practice, and the extension of these rights to products that are made with the use of technologies.

Source: Jagath Gunawardena, this study

Article 4 (Jurisdictional Scope) and Article 5 (Cooperation) together indicate the instances, and geographical area, in which a Party is obliged to act under the CBD. Article 4 of the Convention specifically states that the provisions of this Convention apply (subject to the rights of other States, and except as otherwise expressly provided in this Convention) to each Contracting Party as follows:

- (a) “In the case of components of biological diversity, to areas within the limits of its national jurisdiction; and”
- (b) “In the case of processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction.”

Article 4(a), emphasizes the rights and responsibilities of states towards **biological resources** within their jurisdiction, and limits the Party's obligation to implement the Provisions of the Convention to components of biological diversity in areas within its national jurisdiction.

Article 4(b) specifies the responsibility of Parties to regulate their **activities** (or of their nationals) that will affect biodiversity in areas beyond their jurisdiction.

There is no “innovation” in the CBD in defining national jurisdiction as the Convention applies existing rules of international law to the subject matter of the Convention. The CBD affirms that areas of national jurisdiction are areas in which (a) States have sovereignty over their respective land territories within internationally recognised borders; and (b) in the case of coastal states - in addition sovereignty over their respective territorial waters, and sovereign rights in areas beyond the territorial sea, as defined by the Law of the Sea (UNCLOS).

Article 5 states that: “Each Contracting Party shall, as far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biodiversity.”

This means that Parties should cooperate directly or through competent international organizations to conserve and sustainably use biological diversity in areas beyond limits of national jurisdiction - sometimes referred to as the global commons. This includes the use of living resources such as fisheries in the high seas which are beyond the sovereignty of any State (in “global commons”). Parties, therefore, may only regulate the activities of their nationals within these areas to achieve the objectives of the Convention. In addition, Parties also should cooperate with each other on “matters of mutual interest” (i.e. such as needs of migratory species and use of shared resources, or any other Convention obligation dealing with components of biological diversity within national jurisdiction and which Parties bilaterally or multilaterally agree to cooperate with.

The rights, responsibilities and obligations in Articles 4 and 5 are conveyed in Article 3 which deals with “Principle”. This states that “States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources

pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”.

The Principle while recognizing the “Sovereign right” of a state to exploit its own resources and to choose the regime to regulate exploitation within national jurisdiction, and in the areas where they have the right to exploit biological resources, affirms that these rights (in this case for exploitation of resources) should be in accordance with international law. Parties are also obliged to be responsible for transboundary environmental protection. “Sovereign rights” have also to be in accordance with the Charter of the United Nations such as cooperation in the areas of promoting higher standards of living and seeking solutions to international economic, social and health problems. The principles of international law would mean the obligations derived from various international instruments adopted by the Parties during the past two decades and customary international Law.

● Analysis of CBD Articles 6-20

A detailed analysis of CBD Articles 6-20 are given in **Appendix 1.1**. This analysis has drawn from existing interpretations of the CBD by IUCN - The World Conservation Union, which played a key role in its drafting and negotiations when such interpretations were deemed appropriate. It has also drawn from subsequent decisions taken by the Conference of Parties (COP) to the CBD, where there has been further elucidation of the CBD Articles and discussions with the Legal and Policy expert for the NCSA project.

Overall Sri Lanka has obligation to fulfil all the CBD Articles from 1-20. However, sub articles 9(e), and 12(b) involve responsibility only as a beneficiary. The wording implies that the responsibility for implementing them lies with developed countries that are requested to assist developing countries. Further, as at present Sri Lanka is more a ‘provider’ of genetic resources than a user under the CBD. In this instance, the responsibility of fulfilling sub articles 15 (6) and (7) fall more on the ‘users’ to whom Sri Lanka will be providing genetic resources under the CBD. However, in the event that Sri Lanka becomes a ‘user’ of ‘genetic’ resources in the future, these sub articles are relevant. Sub article 16 (2), (3), and (4) and 19 (1), and (2) similarly imply the responsibilities of country parities that are users of genetic resources when the provider country is a developing country.

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Chapter 2

ENABLING ENVIRONMENT

2.1 Social context

● Population trends

Sri Lanka is a multi-ethnic, multi-religious secular state,¹ with a total population of over 19.5 million² as opposed to 7.2 million at the time the country gained independence in 1948.¹ The present population density has increased to 310 persons per sq.km (Fig 2.1), making increasingly heavier demands on the natural environment. Despite this, birth rates have dropped from 37.5 (per 1000 population) at the turn of the last century¹ to 18.5 (per 1000 population² at present. The population density is also uneven in terms of spatial distribution. The Wet Zone, with a very high biological diversity, has a more favourable climate and better socio-economic considerations than the Dry Zone. It also contains about two thirds of the country's population despite its coverage of less than a third of the island. In comparison, the more geographically prevalent Dry Zone is sparsely populated. For instance, six Dry Zone districts (out of a total of 24 islandwide) have a population density of less than 150 persons per sq km.²

The population in Sri Lanka is still predominantly rural (defined as areas under *Pradeshiya sabhas*),* as less than 20% of the population live in urban areas which are broadly defined as Municipal and Urban Council areas.^{3,4} The rate of urban growth in Sri Lanka has been relatively low, and the urban population increased only by 2.2 million from 1946 to 1981, when the total population increased by 8.1 million.^{3,4}

● Health and life expectancy

Sri Lanka has relatively high standards of health care, and the national health indicators are comparable with those of developed countries. This has considerably helped to increase life expectancy at birth for both males and females, which are respectively 71.7 and 76.4 years.⁵ Death rates were fairly stable between 2001 and mid 2004 (5.8 and 5.9),² but the effect of the tsunami is yet to be calculated. Infant mortality rates are 11.1 (per 000)⁵ at present.

The Government of Sri Lanka provides free health care services through a network of health care institutions including hospitals, dispensaries and health units located in all parts of the country. This enables fair access to health care facilities to a majority of the population through the state or private sector. The number of state hospitals dispensing western medication currently number around 600, supplemented by a network of 400 central state dispensaries and 174 private hospitals.^{1,2} The state also had a network of about 42 hospitals, 114 central dispensaries and 240 other dispensaries under the Department of Ayurveda to dispense free medication¹ using the traditional medication systems. The public health service targets preventive, curative and rehabilitation health care. While preventive health care offered by the state is considered deficient compared with curative health care, over 98% of all children between 12 and 23 months islandwide (excluding the north and east which had not been surveyed) have been provided with polio, BCG and DPT vaccines by 2000.² There is also expanding private sector health care which offers curative services through the western as well as traditional (i.e. Ayurvedic, Unani, Sidda) and Homeopathy systems.¹ Overall the number of traditional medicine practitioners in the category of Ayurvedic physicians - who depend almost entirely on biological resources for their medicines - has risen over the years from over 14,000 in 1998¹ to 17,316 in 2004.⁵

There is also significant enhancement of health services for women and children through pre- and post-natal care nutritional programmes. Some of these facilities are provided by women health workers who visit homes (especially in the more remote and rural areas), and others through the Office of the District Medical Officer of Health (MOH).¹ Despite these advances, the health services are strained, especially during outbreaks of vector borne diseases and natural disasters such as the

* *Pradeshiya sabhas* together with Urban and Municipal Councils are referred to as Local Authorities (LAs).

recent tsunami. The number of hospital beds per 1000 persons, is a low 3.1 and there are 2224 persons per doctor.⁵ Health care reforms are continuing and the government expenditure on the health sector is 1.69% of the GDP.⁵

● Education

Table 2.1 summarises the institutions, students and teachers for general and university education in Sri Lanka for 2004. Education is compulsory for all children between the ages of 5-14, and is free of charge to all students in state schools since 1945 from the kindergarten to university entrance. Expansion of educational services include the provision of free textbooks (since 1980) and material for one set of uniforms (since 1993).⁶ As a result, Sri Lanka has a high adult literacy rate (people who can read a newspaper and write) of 92.5%. Gender wise the literacy rate is 94.5% for males and 90.6% for females.⁶ The participation of boys and girls in general education is now similar, but there is lower literacy among females in the older age groups. District wise literacy rates range between 82.6 and 94.7% (except in the north and east where the 2001 census was not completed) indicating that literacy is high even in rural and more sparsely populated areas.

TABLE 2.1: General and University Education in Sri Lanka

Item	2004*
General Education	
Total schools	10,458
Pupils ('000)	4,031
Teachers ('000)	196
Pupil teacher ratio in (government schools)	21
School density (per sq km)	6
Total expenditure on education (Rs bn) (Including state expenditure on university education)	42
University Education	
Universities (nos.) (including the Open University)	13
Students (nos.) (excluding the Open University)	64,801
Lecturers (nos.)	3,611
Admission to university as a % of eligible	14

Source: Central Bank, 2005 * Provisional data

There is a continual effort to expand the education system to extend secondary educational facilities to the rural and remote areas of the country and to reduce regional inadequacies. There are also ongoing measures to improve the quality of overall education by revision of the school syllabi, teacher-training within and outside teacher training colleges (i.e. this includes training to promote activity based teaching, although not well developed for environmental sciences), and better teacher deployment. The shortage of qualified, competent, committed and motivated teachers to run state schools is perceived as a critical requirement.

Sri Lanka has 13 universities (including the Open University), and about seven institutions affiliated to the universities which offer Bachelor's Degrees in specialised fields.⁵ University education is a public sector monopoly,⁵ and free of charge, except for the Open University which is open to students of any age and with varying basic educational backgrounds. Measures to promote university-industry links are ongoing.^{6,7} There are also six postgraduate institutions affiliated to the state universities. Several private sector institutions have also commenced higher education

programmes, particularly in the technical fields and business management. Some offer degree programmes in collaboration with foreign universities.⁵ There is also a concerted effort to improve technical education and vocational training, and to provide more demand-oriented training for young people. The government expenditure on education is 2.1% of the GDP.⁵

● Labour force and wages

Sri Lanka's current labour force (defined as persons over 10 years of age who are able and willing to work) has grown from 2.6 million prior to independence in 1948 to about 7.3 million in 2004.⁵ Labour force participation at present is respectively 67.9% and 33.6% of males and females of working age.⁵ Over the years there has been a relatively slow growth of demand for labour, coupled with a considerable mismatch between employment opportunities and expectations among the educated youth.³ Hence, unemployment rates rose to over 20 per cent in the mid 1970s,³ but this has now declined to 9%.⁵ In 2004, the Graduate Recruitment Programme was implemented by the government for the state sector, with the dual aim of strengthening the public sector and providing employment for unemployed university graduates in the country.

Wages for the labour force in Sri Lanka are of two distinct types in respectively the private (formal and informal) and the public sectors. The latter comprises government sector at central, provincial and local government sectors and the semi-government sector which includes state corporations, statutory boards and state authorities. Minimum wages are revised based on the decisions of the Wage Boards. Public sector employees enjoy salary revisions from time to time and are subject to the recommendations of the National Council for Administration. The private sector wages are in general much higher for executive level posts than in the public sector. Among the unemployed, 22% expect clerical jobs, while only 1% prefer jobs in agriculture or fisheries, even though 30-35% of the employed workforce are currently in the agricultural sector.⁵ In contrast, 21.4% of the employed persons are in the industrial sector, and 44.5% are in the services sector.

● Housing and lifestyles

In Sri Lanka the demand for houses and urban infrastructure is increasing with population growth and economic development. The annual demand for new housing units is now estimated to be between 80,000-100,000.⁵ There are several public sector housing programmes in progress. For example, under the *Sevana Piyasa* Programme, the National Housing Development Authority (NHDA) provides permanent roofing materials to poor households, and the poorest receive an additional modest financial grant. Despite concerted efforts to improve housing in the country, there is yet a shortfall of houses. This was exacerbated by the fact that an estimated 65,000 houses were completely destroyed and 44,000 houses partly damaged by the tsunami in December 2004.⁵

The average number of occupants per house at present is 4.31 persons.⁵ Over the years, there has also been considerable improvement in the quality of housing in the country, and about 75% of the population live in houses of more than three rooms (compared to 31% in 1953).⁶ The most recent household census in 2001 has shown that about 74% of houses throughout the island (except in the north and east) comprise modern building materials (e.g. bricks and cement for walls); 72% of houses had tile/asbestos for roofing.² About 77% of households have sanitary and toilet facilities, 73% have electricity and 71.5% of households have access to safe water - but only about 28% have access to pipe borne water.⁵ Consequently much of the rural population still depend mainly on well water, water from forest streams, reservoirs, canals and streams which may be contaminated with faecal matter and other pollutants.¹ In achieving the target of the United Nations Millennium Development Goals of safe water for all by 2015, it is targeted to provide 85% of the island's population with safe drinking water.⁵ The problem of rural sanitation is addressed through several rural development and sanitation projects. The problem of housing for urban low-income families who live in slums and shanties is also a major economic, social and environmental issue, which the state is striving to address.

Per capita income in Sri Lanka has passed the US\$1000 value for the first time in history in 2004, but regional disparities remain, with the western province claiming 45% of the GDP.⁵ Lifestyles are changing with increased household income, and household consumption is shifting from food (as in the past) to communication, education, recreation, housing and utilities. About 70% of households now own a radio or TV and 30% own a refrigerator.⁵ Household access to motorized transport and telephone facilities stand at 22% and 25% of households respectively.⁵

● Status of women

Men and women are granted equal status under the Constitution of Sri Lanka. Sri Lankan rural women have a distinct role in the socio-economic aspects of rural communities, and their activities are not limited to domestic chores, although this constitutes an important aspect of their daily lives. Rural women play a major role in agricultural activities and cottage industries, and in general are not overly undervalued in their communities and families. For instance, many community based organisations have female office bearers who receive considerable cooperation from the male members. The state health and nutrition programmes too have continually targeted the reduction of maternal mortality and the enhancement of the nutritional status of pregnant and lactating women through better pre-and postnatal care. Awareness about serious health issues appears, however, inadequate in women, as shown by the fact that only 67% of ever married women were aware of mother to child transmission of AIDS in the year 2000.²

Overall, there has also been a perceptible upward social mobility in the status of women since gaining independence in 1948, mainly due to increased access to education and economic opportunities. This has been promoted by free education, and enhanced opportunities for employment in the industrial sector and through migrant domestic employment overseas. Sri Lankan women have access to free education up to university level. Literacy rates are equitable among males and females between 5-24 years of age.⁵ though female literacy is less than among males for the older age groups. Women are also increasingly expanding their job opportunities in the professional fields, and many have ventured successfully into the technical fields. In terms of professional employment, females dominate areas such as the humanities, health services and teaching, although they are less represented in administrative posts.¹ Notably by 1994 women comprised 70 per cent of all teachers.⁷ However, female labour force participation is only about half the labour force participation of males at present.⁵ and women have a higher unemployment rate than males.² The representation of women in the political and high level policy making scenarios is thought to be inadequate. Representation of women in senior administrative posts (i.e. heads of institutions, heads of major divisions, and in management decision making positions) in the state institutions that have major responsibility for biodiversity management and conservation (FD, DWLC, NBG, CCD) is also low. An exception is the Department of Agriculture and the NZG. It is also noteworthy that the National Experts Committee on Biodiversity has no female representation.

2.2 Economic context

● Economic policy and macro-economic framework

Sri Lanka's macroeconomic policies are pro-growth and pro-poor, but continue to uphold market based economic policies. The country's economic growth and poverty alleviation programmes focus on regionally balanced growth with rural and small and medium private sector development; with the medium-term objective of macroeconomic stability and a regionally balanced economic growth rate of about 6-8 percent. This is complemented by the country's current monetary policies which aim at containing inflation while supporting economic growth. The high priority given to development has resulted in a widening gap of investments over savings; resulting in increased use of the country's savings and official reserves in recent years. Being an open economy, open market operations prevail with considerable individual freedom. Overall, the country's monetary and fiscal policies are geared towards improving macroeconomic stability by enhancing development, increasing investment and poverty reduction. This has to some degree had a positive impact on the environment. The pro-poor economic policies adopted by successive governments have, however, not achieved the expected levels of poverty alleviation and the creation of a safety net for the poor.

The contribution of the service sector (including electricity and water), manufacturing and agriculture are shown in Fig. 2.2. The agriculture sector comprising agriculture, forestry and fishing collectively contribute less than 18 % of the total GDP. Despite this, export agriculture based on the island's bioresources make a substantial contribution to the economy, particularly tea, rubber and several other minor export crops.

The current economic policy envisages prominent roles for both public and private sectors. Public investment and infrastructure for rural development and for modernisation of the rural economy by

enhancing science and technology and credit in small and medium enterprise to increase productivity are particularly promoted.

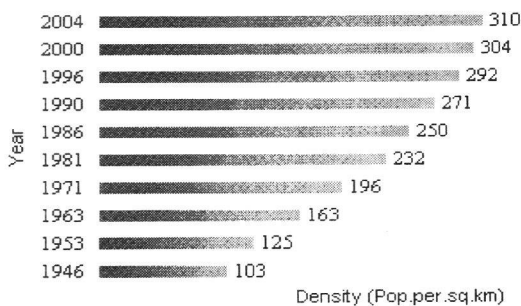
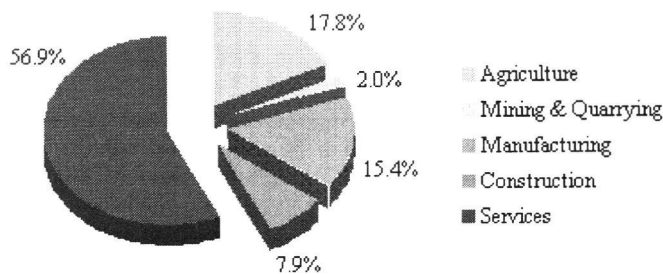


Fig. 2.1: Population Density in Selected Years

Date Sources: Central Bank (1998 & 2001, Dept. of Census and Statistics, 2005)



Data Source: Central Bank, 2005

Fig. 2.2: Sectoral Composition of GNP – 2004

Mining and quarrying, manufacturing, construction, and electricity and water comprise the industrial sector

Date Sources: Central Bank (1998 & 2001, Dept. of Census and Statistics, 2005)

● Poverty alleviation

Despite the relatively high quality of life in Sri Lanka, and continuing measures to reduce poverty in the country during the past few decades, about 6.6% of the population have an income of less than 1 US\$ per day, and 775,000 families lived below the official poverty line (of Rs 1928/- income per month) as at January 2006.^{2,5} Even so, about 1.9 million families have benefited directly from the *Samurdhi* income supplementary programme in 2004. This highlights the need to improve social welfare and benefits for the really deserving households. The Welfare Benefit Act of 2002 provides the legal framework for improving the targeting of welfare programmes in a more transparent manner.⁵

The highly skewed income distribution in the country, with about 10 per cent of the population receiving 41 per cent of the total income, while the lowest 40 per cent get only about 13 per cent of the income,¹ shows that Sri Lanka has a long way to go towards the alleviation of poverty despite

the many initiatives taken by successive governments to address this issue. There is a special ministry which deals with poverty alleviation.

● Trade and foreign investment

The economic policies of the country encourage foreign investments by providing foreign exchange and employment opportunities to catalyse the development process. The Board of Investment (BOI) is the facilitator of foreign investment. Many investment projects are carried out by foreign as well as domestic investors. Public-private partnerships or arrangements are encouraged to promote large-scale infrastructure projects. Economic liberalisation in the country since the late 1970s had resulted in the relaxation of entry barriers and outsourcing of management, encouraging private public partnerships, and privatisation, amongst others. Even so, private sector involvement in biodiversity conservation and the sustainable use of biological resources remains fairly low. The current economic policies continue to support the liberalisation of trade, but limited capital account restrictions are in place to safeguard the economy from large, sudden and unstable capital flows, and there is an independently floating exchange rate regime since 2001. External trade plays a fundamental role in the country's open economy, and both exports and imports have continued to grow while financial markets have expanded. Inconsistent trade policies in recent years due to changes in government have, however, constrained investment. Expansion of the agricultural sector has been particularly affected due to changing policies for the import of agricultural produce.

Sri Lanka is a member of the World Trade Organisation (WTO). The 2004 Periodic review of Sri Lanka's trade policy direction by WTO has been mostly positive. Sri Lanka is also a signatory to the Trade Related-aspects of Intellectual Property Rights (TRIPs). Further, The General Agreement on Tariffs and Trade (GATT) has been ratified by Sri Lanka in toto. According to the TRIPs agreement, the term of patent protection in GATT member countries is no less than 20 years from the filing date of the patent application (Article 33); the IPR related criminal procedures are specified under Article 61.^k

● Transport (roads and transportation)

Sri Lanka's transportation network which covers the road and rail network, sea, waterways and air transportation are an important part of the nation's economic infrastructure. Currently land transportation is the main mode of internal transport. The total active vehicle stock in the country (i.e. passenger cars, lorries, buses, three wheelers, motor cycles, etc.) has grown rapidly from 1978 as a result of the introduction of open market economic policies. The number of registered vehicles has grown to 2,297,111^b from 1,112,749 in 2000.^a This has had considerable impact on increasing air pollution in the Colombo city, particularly due to the growth of two stroke motor-cycles and three wheelers.

The island has 11,661 km of national roads and 4429 bridges maintained by the Road Development Authority (RDA), and 1,447 km of railways maintained by the Railway Department. Provincial and local government councils maintain over 90,000 km of provincial and local roads. However, lack of funds and the proper channeling of existing funds are critically hampering the maintenance of rural and provincial roads. A large number of road development projects are underway to alleviate road congestion in Colombo and the suburbs and for further development of the road network. While EIAs have to be carried out for such projects specific criteria that address biodiversity concerns, biodiversity impact assessments or BIAs is not part of the EIA process. This is a constraint.

Due to the island's strategic geographic location, Sri Lanka has high potential as a port of call, for international marine transportation. During 2004 nearly 4000 vessels called over at the island's three major ports at Colombo, Galle and Trincomalee. A fourth port (Hambantota) is expected to be developed as a bunkering centre.^c At present about 37 airlines, including 8 cargo airlines are operating out of Sri Lanka. The ongoing Bandaranaike International Airport expansion project is expected to upgrade facilities at the airport and thereby help attract more airlines to the island.

● Communication

The two major telecommunications services in the country are the postal and telecommunications services. While the postal services comprise one of the largest network of delivery services in the country, it needs considerable modernisation for varied products including data transfer. In

contrast, there is a vibrant telecommunication service with significant competition between 77 licensed telecommunications operators in the island.^e

Internet and e-mail services are available throughout the island, but these facilities are mainly concentrated in urban areas.

TABLE 2.2: Postal and telecommunications services in Sri Lanka

Item	No in 2004*
Telecommunication services	
Total fixed access telephone density ('00)	5.1
All telephones ('00) (including cellular phones)	16.0
Internet and email ('000)	4.5
Postal Services	
Post offices (public and private)	4702
Area served by a post office (sq. km)	13.9
Number of persons served by a post office	4100

Source: Central Bank, 2005, * Provisional data

● Energy

As yet 48% of the population use biomass energy as the main source of energy for the island. This is used mostly by households and to a more limited extent by the plantation sector. The island at present has a total installed power capacity of 2,358 Mw, supplemented by 35 Mw from privately owned mini- hydropower plants. Of this total, 54% is from hydropower, 46% from thermal power and .01% from wind power.^e

● Industrial growth

Sri Lanka has been gradually changing from an agricultural based economy to an industrial based one over the last few decades and presently follows a liberalised industrial policy. At present industry comprises 26% of the GDP.^e The thrust of industrial policy in Sri Lanka has been the development of private sector-led, export-oriented industries with sufficient diversification in relation to both products and geographical location. However, relatively little attention has been paid in the past to ensure environmentally sustainable development in the sector. A positive factor has been that Sri Lanka's early industrial expansion was in the garment industry - which is relatively non-polluting - and in the tourist industry - which is low-polluting and dependant on a high quality environment for sustenance. The present economic policy also aims for modernisation of the rural economy by enhancing science and technology in rural areas, and by providing credit for small and medium enterprises to increase productivity.

The rate of industrial output, measured as the output of factory industries, is growing. Accordingly, the number of small industries in 2004 with less than 10 employees numbered 121,426 and provided jobs for 285,623 paid employees, while medium and large industries number only 9961 and have 747,828 employees.^b The small and medium enterprise sector continues to make a valuable contribution, especially by way of those entrepreneurs engaged in tea production, apparel and garment industry, public omnibus service, domestic trade, tourism and the construction industry. This sector was, however, badly affected by the 2004 tsunami disaster.

● Tourism development

Tourism is a top income earner in Sri Lanka and has netted in US\$416 million in foreign during 2004 from peak tourist arrivals (566,200), resulting in gross earnings of US\$ 416 million for the year.^b

Until the tsunami struck in December 2004, there were about 1077 tourist hotels and restaurants islandwide providing 14,322 rooms as accommodation capacity.^b At the commencement of tourism growth in Sri Lanka in the 1980s, the influx of tourists attracted to the island's wide sandy beaches caused a concentration of tourist infrastructure along the southwestern coastal belt. As such, several coastal areas were beleaguered by unplanned tourism development, leading to the pollution of coastal waters and habitats, degradation of scenic sites, coastal erosion and user conflicts with the traditional fishery.^k The need for a more planned approach is now generally accepted.

Sri Lanka's rich biodiversity offers ample potential to support the government's current tourism related policy aimed at maximising potential for nature-based tourism and cultural tourism. Both ecotourism and culture tourism have the capacity to provide conducive employment opportunities to rural youth, and thereby motivate communities to protect the natural environment that provides their livelihood, and also serve the dual purposes of environmental protection and employment generation. All such initiatives need, however, to be closely monitored to ensure that the natural environmental or cultural sites are not eroded and that the tenets of 'sustainable tourism' are followed. Ecotourism has however become a catch-phrase for activities linking tourism and nature (e.g. mass tourism to beaches and national parks), rather than only be used to describe the type of tourism that promotes conservation of the natural resources at tourist destinations and benefit the local people. As tourism depends on the quality of the environment, and tourists are increasingly sensitive to environmental degradation at their travel destinations, planned management of tourism is required to sustain and enhance the tourist industry.^a

● Natural disasters

The tsunami which struck the country on 26th December 2004 resulted from an earthquake off the western coast of Northern Sumatra registering at 9.3 on the Richter scale. Coastal infrastructure and public and private property were severely damaged creating a major loss in economic activity, particularly due to the total disruption of fishery, coastal tourism and small scale industries in the affected areas which cover about two thirds of the island's coastline. The total damage is estimated at around US\$1 billion or nearly 5% of the national GDP. It therefore caused a reversal of national economic growth by 0.5-1.0% of the original estimated growth of 6%. The tsunami disaster thus posed a major drawback to the stability of the financial sector, and caused a complete change in the medium-term macroeconomic outlook of the country. Nevertheless, extensive rehabilitation and reconstruction programmes were planned. Extensive rehabilitation and restoration processes in the tsunami hit areas are underway. Reconstruction costs are estimated at US\$ 1.8 billion or 8.9% of the GDP.

Prior to the tsunami, coastal erosion in certain areas of the coastline during the past decades, caused severe damage to property, houses and other infrastructure and affected activities such as fishing, tourism and recreation in the coastal zone.^{1,9,10} On many occasions, coastal erosion necessitated the restoration and repair of the main national highway, and the railway line that runs parallel to the shoreline at several points along its length. Much of the coastal railway lines and the eroding coast (in addition to other areas) were damaged by the tsunami. About 70% of tourist hotels and 61% of industrial units in Sri Lanka were located in the coastal areas prior to the tsunami.¹⁰ Although only a few had been seriously affected by coastal erosion, many were badly damaged by the tsunami. As much of the coast protection structures along the southwest coast were affected by the tsunami,¹ a considerable section of Sri Lanka's eroding coastline remains devoid of protection structures.

On a routine basis, Sri Lanka has to face several other types of natural disasters annually. Drought is the major natural hazard in Sri Lanka, and the country experiences dry spells for at least a short period of time each year. These effects are generally localized in the dry zone areas, and droughts of regional significance occur around every 3-4 years.¹ While they do not take a heavy toll of life, there is considerable expenditure by the government for relief as compensation of crop failure. Droughts therefore have a very serious negative impact on the socio-economic aspects of the country.

Landslides have also been a frequent problem in Sri Lanka for many decades, and they generally follow very heavy and prolonged rains for over two days. About 12,500 square miles in the country are vulnerable to this hazard; mainly in the central and southwestern parts of the country. There is evidence, however, that the frequency of landslides has increased in Sri Lanka since the early

1980s. Underlying this are the clearing of forests in watershed areas, obstruction of natural waterways and drainage paths, construction of infrastructure in vulnerable locations, cultivation of seasonal crops on steep slopes, the construction of large reservoirs through the accelerated Mahaweli Project, and the impact of land clearing in the hills during colonial times.

Almost all river basins in Sri Lanka are also flood prone. Serious flooding frequently occur in the *Kelani*, *Kalu* and *Mahweli* river basins, while occasional floods occur in many other rivers. Floods are prevalent mainly in the Wet Zone, particularly in areas having high rainfall such as Ratnapura. The frequency and damage from floods has increased in recent years due to human activity such as deforestation - especially because of the loss of forest areas that protect the headwaters of major Wet Zone rivers and exposure of soil in cultivated lands which increases run-off of rainwater and the siltation of rivers and streams. Many parts of Colombo and the suburbs have also been subject to frequent flooding due to the increase of impenetrable surfaces for urban development, the inadequacy of the drainage system in the area and adverse state policy in the past for filling up low-lying areas and marshy lands that are part of the flood retention network.

As Sri Lanka is situated outside the cyclone belt, cyclones are less felt in the island than the Indian subcontinent. However, several serious cyclones have been felt with most damage being felt in the northern and eastern parts of the island, and to a lesser degree in some areas of the North Central Province.¹

2.3 Environmental context

● The natural resources base

Sri Lanka's diverse bioresources serve to maintain a range of economic activities within the island. Foremost among these are agriculture, the marine and brackish water fishery and tourism. Agriculture, forestry, fisheries and water had contributed about 14.5%, 1.6%, 1.9% and 0.2% respectively, and a total of 18.2% of the GNP at Current Factor Cost Prices in 2004.⁵ Both agriculture and fisheries continue to be important sources of foreign exchange. Estimates show that the marine fishery provided approximately 88.4% of the total fish production in Sri Lanka in 2004,⁵ with the coastal fishery[#] contributing 61% of this share.² Prior to the tsunami, the fisheries sector provided direct employment to about 150,000 people, and sustenance to at least a million.^{1,10} Fish also constitutes the top source of animal protein for Sri Lankans.¹

Sri Lanka's natural forest cover is now around 31% of the island's 65,610 sq km, and natural closed canopy forests have dwindled to about 22 % of the total land area from 44 % in 1956. Moreover, tropical humid forests - which is the biologically richest vegetation type - are confined to about 9.5% of the island's ever-wet southwestern quarter. Although much of the endemic species among both fauna and flora are concentrated in the wet zone, lowland rain forests in this region comprise only 1.9% of the island's land area. Wet sub-montane and montane forests cover a further 1.01 % and 0.05% respectively.¹¹ These forests are also heavily fragmented and only a few are more than 10,000 ha in extent. Although about 9,462 sq km of natural forest and scrubland amounting to around 15% of the island is declared Protected, only about 18% of this network occurs in the biologically rich wet zone.^{12,13} Many people still depend on forests for subsistence and commercial use of products.¹⁴

A biodiversity assessment of natural forests under the National Conservation Review (NCR) carried out by the Forest Department (FD) in the 1990s revealed that Sri Lanka's protected area network had critical gaps for conserving biodiversity and hydrological features.^{15,16} This is because much of the present protected area network lies in the Dry Zone for historical reasons due to their establishment as large game hunting reserves.¹ A gap analysis in the Protected Area network is nearing completion by the Protected Area and Wildlife Conservation (PAM&WC) Project carried out currently by the Department of Wildlife Conservation (DWLC). Small biodiversity rich or ecologically sensitive areas that may require some sort of protection are being declared under the National Environmental Act for management of development activities in them.^{17,18}

Overall, Sri Lanka has high ecosystem and species diversity on land as well as in the coastal and marine areas. A high degree of genetic diversity is suspected among wild species, and is known to

[#] Defined as the coastal fishery conducted primarily by day boats over the continental shelf.

be high for agricultural crops. Endemism is particularly high among flowering plants, freshwater fish, amphibians, reptiles, and some invertebrate groups that have been investigated to a fair extent. Most endemics are, however, under threat and found mainly in the fragmented wet zone forests.^{1,13} Accordingly, Sri Lanka has been selected (along with the Western Ghats) as one of the worlds' 34 biodiversity hotspots due to high endemism and threats to biodiversity.

TABLE 2.3: Extent of Protected Areas Established Under the Forest and Wildlife Departments in 2004

	Area present (ha) in 2004
FORESTS UNDER THE FOREST DEPARTMENT	1,421,954
Closed canopy natural forests*	1,046,291
<i>a. Forest Reserves</i>	<i>289,824</i>
<i>b. Proposed Forest Reserves</i>	<i>252540</i>
<i>c. Other state forests</i>	<i>503,927</i>
Sparse forests	366,848
Mangroves	8,815
Forest Plantations	93,000
AREAS UNDER THE WILDLIFE DEPARTMENT	
National Parks	506,130
Nature Reserves	51,606
Jungle corridors	19,141
Sanctuaries	307,078
Strict Natural Reserves	31,574

Source: Statistical Abstracts, 2005.

*including conservation forests

Constitutional provisions for environmental conservation

Article 27(14) of the 1978 (current) Constitution of the Democratic Socialist Republic of Sri Lanka decrees that “The State shall protect, preserve and improve the environment for the benefit of the community.” Article 28f further states that “The exercise and engagement of rights and freedom is inseparable from the performance of duties and obligations, and, accordingly, it is the duty of every person in Sri Lanka to protect nature and conserve its riches.” Although these provisions are not legally binding, the Constitution vests “sovereignty” in the “people” and this is inalienable, and the executive, the legislature and the judicial system are merely the instruments through which “sovereignty” is expressed. Hence according to the Constitution, the state is only the trustee or guardian of all natural resources which are vested in the people. Executive or legislative action that goes against the principle that safeguarding Sri Lanka’s Natural Resources by its citizens (as this is a duty and not an option) can be challenged in the Courts as unconstitutional.

BOX 2.1

Sovereign rights over Sri Lanka's biodiversity

"Sovereign rights are enshrined in the Constitution of the Democratic Socialist Republic of Sri Lanka in both Articles 27 (Directive Principles of State Policy) and 28 (Fundamental Duties). This has been affirmed and upheld by the Supreme Court in SCFR 884/99 (*Bulankulama and six others vs. Secretary, Ministry of Industrial Development and seven others*)"

Source: Jagath Gunawardena, this study

The 13th Amendment to the Constitution of Sri Lanka passed by Parliament in 1987 introduced Provincial Councils as a new level of governance between the Central Government and Local Government. This resulted in a major shift in government policy to decentralise and devolve many functions of the Central Government to the Provinces. Provincial Councils are empowered with legislative and executive powers over several subject areas including the environment (known as a devolved subject), and for intra-provincial projects relating to irrigation, land development, road development, transport, agricultural services, health and education. A Provincial Council may, thus, enact laws pertaining to the environment within the area under its control, provided this does not supersede or conflict with laws passed by Parliament. A case in Point is that the North Western Province has set-up its own Environmental Authority. However, this body, along with most provincial bodies and local authorities have as yet poor institutional capacities to formulate or implement environmental laws and regulations or engage meaningfully in biodiversity conservation.

● Institutions for environmental conservation

The Ministry dealing with environment:

The subject of environment was elevated to Cabinet ministry level in 1990 with the creation of the Ministry Environment & Parliamentary Affairs. Since 2005 the Ministry of Environment forms a stand alone ministry.

Currently the the Ministry dealing with environment is mandated to:

- Identify/analyse problems in environment and natural resources sector through stakeholder consultation to enable policy formulation.
- Undertake Strategic Impact Assessment of environment and natural resources related policies.
- Develop environment and natural resources policies, policy dissemination and ensuring implementation.
- Take measures to ensure harmonization of environmental policies with other sector policies so that environmental sustainability is ensured in development process.
- Take measures to ensure compliance with international commitments arising out of MEAs for which Sri Lanka is a party.
- Develop strategies, master plans and action plans to implement the environment and natural resources related policies.
- Execute pilot projects related to new sector policy initiatives.
- Develop and formalize the environment and natural resources sector wide monitoring system, comply with monitoring requirements, reporting and to take remedial actions.
- Carry out policy research, analysis and dissemination of results of policy implementation and evaluation to the general public.
- Create an enabling environment for public and political commitment towards sound environmental management.
- Create environmental education and awareness at national level in relation to the environment and natural resources policy reforms and other major environmental initiatives.
- Commemorate environmentally important national and international days
- Create institutional reforms within the ministry based on the policy reforms.
- Build capacity for environment and natural resources related policy implementers and other

stakeholders.

- Provide supportive regulatory framework to carry out the environment and natural resources management activities.
- Create sound administrative support to carry out the functions efficiently.
- Mobilize financial and human resources for operationalization of technical and supportive functions
- Build capacity among the staff of the Ministry to carry out the functions mentioned above.

The functions of the ministry include facilitating sustainable development by the promotion of sound environmental management, and for monitoring and reporting progress of the National Environmental Action Plan and its periodic revisions.

Due to its mandate, the Ministry dealing with Environment is the premier body for formulation of environment and natural resources related policy and legislation in relation to environmental protection, management and monitoring. The Ministry directly formulates some of these policies and laws, but various other line ministries in consultation with the Ministry of Environment take the lead role in formulating others. Implementation of these policies and laws, except for some pilot projects, are however, implemented through the implementing agencies under the Ministry. These are the Forest Department (FD), Department of Wildlife Conservation (DWLC), Central Environmental Authority (CEA), Marine Pollution Prevention Authority (MPPA), Geological Survey and Mines Bureau (GSMB); State Timber Corporation (STC) and the Sri Lanka Wildlife Trust (SLWT). Some of the policies and plans formulated by the MOE have to be implemented by various other line ministries, agencies, local level agencies, NGOs and even the private sector. The MOE is also the focal point for a large number of international conventions related to the environment.

Structure: The Ministry of Environment (MOE) has several divisions dealing with Natural Resources Management, Biodiversity, Pollution Management and Control, Environmental Economics and Global Affairs, Promotion, Policy Planning, Human Resources Development and Administration.

The environmental economics and global affairs division of the MOE is responsible for assessing the use of economics for ensuring environmental sustainability. It also carries out Strategic Impact Assessment (SIAs) of environment and natural resources related policies connected with economic development, and studies relevant to assess economic aspects of development and the environment and services the Convention on Climate Change and its related protocols. The Biodiversity Division of the MOE deals specifically with all aspects of policy and plans related to national biodiversity conservation, and national actions under the Convention on Biological Diversity and the Cartagena Protocol.

Other institutions responsible for the environment:

Overall about 30 state institutions are involved in the management and protection of the environment and natural resources. Among these, several have high responsibility for conservation and management of biodiversity. These are the Forest Department (FD), Department of Wildlife Conservation (DWLC), Central Environmental Authority (CEA), the Marine Pollution Prevention Authority (MPPA), the Coast Conservation Department (CCD), The Ministry dealing with Fisheries, the Department of Fisheries and Aquatic Resources (DFAR), the Department of Agriculture (DOA) and the institutions that function under it, the National Botanic Gardens (NBG), the National Zoological Gardens (NZG), the Urban Development Authority (UDA), the Department of Animal Production and Health (DAPH) and the Veterinary Research Institute (VRI). The Sri Lanka Land Reclamation & Development Corporation (SLLRDC) is also mandated with some aspects of wetland conservation.

While policies related specifically to biodiversity conservation in forests, wetlands and wildlife conservation areas (i.e. areas under the DWLC) are generally drafted by the Ministry of Environment (i.e. also because the institutions dealing specifically with forests, wildlife reserves and wetlands are currently under this ministry), the ministry dealing with policy planning and implementation is the key agency responsible for formulation of national development policies. The National Planning Department which is under this ministry deals with policy planning and implementation, and also plays a strong role in the development of the medium-term macroeconomic framework and sectoral programmes.

● Status of environmental governance

A study of several key state sector environmental agencies by the Public Interest Law Foundation (PILF), a national NGOs, reveals that the success of environmental governance in Sri Lanka at the national level was perceived as medium (by these institutions themselves) while performance of these institutions at the decentralised level scored slightly less.

Table 2.4: Indicators of e-governance and their perceived effectiveness in Sri Lanka

Indicators of e-governance	Average rank on a scale of 0 (nil) to 4 (100%)
Strategic vision: Leaders and the public have a broad and long-term perspective on good governance and human development, along with a sense of what is needed for such development.	2.1
Transparency: Information flows freely; institutions and information are directly accessible to those concerned with them and enough information is provided to understand and monitor them.	2.3
Accountability: Decision-makers, whether in government, the private sector or civil society organisations, are accountable to the public as well as to institutional stakeholders.	2.1
Predictability: Institutions and individual officials respond to all stakeholders consistently and in a consistently timely manner.	1.4
Participation: All men and women have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their intention.	2.4
Consensus orientation: Different interests are mediated to reach a broad consensus on what is in the best interest of the group and, where possible, on policies and procedures.	2
Subsidiarity: Responsibilities and tasks are delegated to the level most appropriate for accomplishing them effectively and efficiently.	2.1
Integration: Environmental considerations are incorporated into development decision-making.	2.3
Rule of Law: Legal frameworks are fairly and impartially enforced	2.3
Other features required for e-governance - continued	
Overall effectiveness of key environmental institutions at the national levels	2
In promoting environmental conservation	
Overall effectiveness of key environmental institutions at the decentralised level promoting environmental conservation	1.9

Source: Study of Environmental Governance in Sri Lanka by the Public Interest Law Foundation, 2005¹⁹

The same study showed that the main institution for environmental policy formulation was perceived as the Ministry dealing with Environment. The CEA was recognized as the key agency for implementing environmental law and policy, while DWLC, FD and CCD and Local authorities were considered important in their respective spheres for law enforcement.

● Policies influencing biodiversity conservation

While the concept of biodiversity conservation was introduced to Sri Lanka in the late 1980s, the country has a long-reaching history of environmental conservation initiatives, especially during pre-colonial times.

Sri Lanka was one of the first countries in Asia to prepare a National Conservation Strategy (NCS) in 1988. This comprised a preliminary strategy to deal with problems of environmental degradation in the country.

To translate the NCS into a workable plan of action, the CEA prepared the first National Environmental Action Plan in 1991. Since then, there have been several revisions of the NEAP as warranted by the NEA. The current NEAP is termed "Caring for The Environment: National Agenda for Sustainable Development 2003-2007" (It is abbreviated as the CFE). The CFE contains the National Environmental Policy, development linked environmental strategies for implementing the policy, and a comprehensive set of actions for managing the environment so as to make the development process sustainable. Development is perceived with the active involvement of NGOs, business sector with the government sector at both national and provincial level. The main sector based environmental action programmes from 1990-2001 are listed in the CFE in terms of forestry and wildlife conservation; agriculture, plantations, land development and mining; fisheries and coastal and marine area management, industry and tourism; energy and transport; and health sanitation and urban development. Conservation of biological diversity is conceived as cross-sectoral action for overall natural resource management. This conforms with the CBD and for integrating biodiversity considerations into cross-sectoral plans and programmes.

Sri Lanka's first National Forest Policy (NFP) was developed in 1929 to emphasize the importance of soil and water conservation and the preservation of indigenous fauna and flora. Sri Lanka's Forest Policy has since then been updated and amended; the most recent being the Forest Policy of 1995. Sri Lanka's first Wildlife Policy was developed in 1990, and revised again in 2000. The Forestry Sector Master Plan prepared in 1995 (for the period 1995 to 2020) addresses management of areas under the forest Department and the Department of Wildlife Conservation (although this is now followed only by the FD).

The National Wildlife Policy of 2000 emphasises state commitment to conserve wildlife resources for the benefit of present and future generations. The National Forest Policy of 1995 and the Forestry Sector Master Plan (FSMP) of 1995 also identify biodiversity conservation as a key objective of forest and wildlife conservation. All three advocate reorientation of the traditional top down approach to forest and wildlife management by enabling greater involvement of local people in planning and managing Protected Areas.

The National Biodiversity Conservation Action Plan received Cabinet approval in 1998 and was published in 1999. An addendum to this was prepared.

The policies, strategies and actions to address issues in the coastal areas are addressed by the National Coastal Zone Management Plan (CZMP). This is periodically updated and revised by the Coast Conservation Department (CCD), which is mandated to do so by the Coast Conservation Act (CCA) of 1981. The first CZMP was approved in 1990. The latest is the CZMP of 2004. It addresses the various issues of coastal resources management comprehensively. Special Area Management (SAM) at selected coastal sites is promoted through the CZMP. SAM sites have specific complex issues to be addressed, and integrated management is proposed, through which resource management could be envisaged to be devolved to local stakeholders. Despite the fact that the preparation of policies, strategies and actions in the coastal sector are done with considerable stakeholder consultation, there are innumerable problems of coordination which preclude effective implementation of the CZMP.

Until the mid 1990s, the fisheries sector policies traditionally sought to increase fish yields by paying scant attention to conservation and sustainable use of its the fisheries resources. Due to the heavy decline of near-shore fish yields, however, there have been many projects to promote sustainable fishery and conservation of aquatic resources. Concepts of sustainable fishery and conservation of aquatic resources are now addressed in the Fisheries Act and fishery sector institutional plans and policies. These are based on recommendations made by the National Aquatic Resources Development Agency (NARA), and more recently from the concluding Coastal Resources Management Project (CRMP). However, the concept of responsible fishery which was accepted in the fisheries policy was set back to some extent after the tsunami. This was due to the influx of boats and fishing gear that were received from donors to enhance fishing effort. Distribution has been carried out with scant regard to earlier policy decisions and continual resource use recommendations for fishery development. Consequently, the fishing effort at present appears to have exceeded pre-tsunami situation, despite the loss of about 8000 fishers and gear during the tsunami.

In the past the government policy for the agricultural sector was to move towards self sufficiency in essential food items (e.g. rice, fish sugar, pulses and milk), due to the attempt to raise the productivity of tree crops and promote diversification of crops to increase rural agricultural employment. The National Agriculture, Food and Nutrition Strategy of 1984 aimed at assessing Sri Lanka's agriculture and food situation along with the establishment of priorities for future sectoral development. This recognised that the proper management of the land resource was crucial for future agricultural development of the country. In 1995, the then Ministry of Agriculture, Lands and Forestry released a fairly comprehensive National Policy Framework for Agriculture, Lands and Forestry.^{21,22} While it does not intend to spell out an overall policy perspective for agricultural development, it does articulate key policy issues relevant for special commodities and crops - in terms of rice, and other crops considered under domestic agriculture, export agriculture and plantation agriculture - as well as for forestry, livestock and fisheries.

The present agricultural research policy²² is based on demand driven research on the food crop sector which will be productive, eco-friendly, sustainable, economically viable and socially acceptable. In the context of this policy framework for agricultural development, a comprehensive National Agricultural Research Plan was developed in 1999 by CARP to instigate a coherent national level programme of action for the National Agricultural Research System (NARS). NARS covers the agricultural faculty of the University of Peradeniya and the plantation crops research institutes (i.e. the Tea Research Institute (TRI), The Rubber Research Institute (RRI), the Coconut Research Institute (CRI) and the Sugarcane Research Institute (SRI) in addition to the Department of agriculture and the institutions under it.

Although a detailed Agriculture Research Plan for rice and other food crops (for the period 2000-2008) was prepared for NARS, this has not been holistically implemented due to the shortage of resources. However, some aspects of it have been addressed by individual institutions within NARS. In view of the increasing population, decreasing per capita arable land area and the need for environmentally sustainable agriculture, the direction of the future research programme of the DOA is geared to promote crop improvement for enhanced food production by the use of global and domestic genetic resources; promoting strategic research on crop production through the use of bio-technology, bio-fertilisers, protected agriculture (with private sector collaboration), biodiversity conservation and management of eco-systems; and generating cost effective environmentally friendly technology which includes sustainable farming systems, nutrient and water management and pest and disease management. The future research trends are expected to give weight to a greater understanding of natural resources, the environment and resource sustainability, soil and land management and developing appropriate partnerships both nationally and internationally. Other important areas to address are support for the research mandate of the DOA by developing an information system that will facilitate sharing of advanced and improved technologies with farmers as well as for collaborative research with other countries.

After the amalgamation of agriculture, irrigation, environment and Mahaweli development under one ministry in November 2005, arrangements have been made to draft a new agricultural policy that will give greater focus towards poverty alleviation through agricultural development.

The livestock development policy and research policy for the livestock sector^{23,24} deal with: characterisation (using morphological traits) of crop-livestock systems; optimising the use of resources; studying collection and marketing patterns of animals and produce in relation to economics of farmers and farming systems; determining the potential of non-traditional livestock species and their suitability for local farming systems; studying diseases that could be transmitted to humans; determining the environmental effects of livestock farming; and developing methods to use animal wastes. There is a National Agricultural Research Policy (NARP), and a national breeding policy to which all animal breeders have to adhere to and is revised periodically on an annual or biannual basis.

The policy objective of the Sri Lankan livestock sector is: "Stimulate profitable livestock production in smallholder farming systems and commercial farms to boost rural incomes and improve self-sufficiency and food security within the context of an open market economy where imports will continue to compete with domestic supplies" Notably, the policies of this sector do not consider the requirements for conservation and sustainable use of indigenous animal resources. However, the DAPH and VRI are both aware that local genetic resources can be used for livestock improvement. The policies and strategies in the sector are geared toward yield enhancement,

marketing, disease prevention among livestock and protecting human health from diseases transmitted by animals, both domestic and wild. The latter includes preventive and control measures ranging from identification of disease, preventing spread, providing advice on preventive measures and the preparation and facilitation of the use of vaccines in this regard.

Policy in the wetlands sector has been lagging, probably due to the absence of an institution that deals specifically with wetland issues.^{1,17,25} The wetlands policy has also been in draft form since the mid 1990s, but is now being published by the wetland unit of the CEA. The National Wetlands Act has been in draft form since 1989. The wetland unit is pursuing the possibility of an amendment to the NEA to address wetland concerns through the addition of a new section (D). Land reclamation policies have been prepared to help stop the conversion of wetlands to other uses. A special unit has been created in the CEA to coordinate implementation of the National Wetland Policy, but this unit needs considerable strengthening if it is to contribute meaningfully. The Ministry dealing with environment is finalising a national sand policy with regards to inland sand mining, which has considerable bearing on wetland biodiversity as well as coastal biodiversity.

The MOE has prepared a national policy on biosafety²⁶ through the national biosafety project, and this has been granted Cabinet approval. In compliance with the Cartagena Protocol on biosafety, the main goals of the national biosafety policy are to: (1). Ensure the highest possible level of biosafety in transfer, handling and use of genetically modified organisms on the basis of precautionary approach, and (2). Develop the national biosafety framework and all its components. The biosafety policy includes the identification of centres of excellence for testing of Genetically Modified organisms (GM testing), their accreditation and support. The national biosafety project has also prepared a comprehensive national biosafety framework and a database which could be made available on the web. This framework²⁷ is expected to be implemented by the MOE under Phase II of the National Biosafety Framework Project.

Together these various plans, strategies and policies constitute the main instruments that address the various aspects of biodiversity conservation in the country today. They form the environmental policy framework which has helped shape several sectoral and national development plans, strategies and programmes.

Major gaps in policy:

Article 15 of the CBD promotes providing external country parties access to indigenous genetic resources in source countries in return of equitable sharing of benefits from such access. However, Sri Lanka has no policy on providing Access to Genetic Resources (and biochemical substances produced by genes of indigenous species) in the context of gaining fair and equitable benefits from such provision. This policy is essential to guide officials in the "exercise of their statutory discretion" as and when such access is provided. At present, the exchange of genetic resources is happening within many institutions as part of their institutional research mandates or institutional policies (e.g. DOA, DAPH, ITI), for taxonomic identification or for various research purposes where whole specimens or parts of organisms are sent overseas to partner institutions. The DWLC (assisted by the FD) has the authority to provide permits for export of wild bioresources. However, it is not clear what the institutional policies are for 'benefit sharing' in these instances, and whether the exchange is facilitated through material transfer agreements (MTAs). A policy on Access to Genetic Resources is also essential to indicate national requirements to potential external partners with whom collaboration is likely (or is already happening) for research on Sri Lanka's genetic resources. There are also no national policies to: (a) govern biodiversity information exchange; (b) biotechnology using indigenous (and exotic) genetic resources - especially when there is foreign collaboration; (c) identify a national network of areas for Protection; (d) promote *ex-situ* conservation and captive breeding of threatened or commercially important protected species. The current livestock development policies do not adequately address conservation and sustainable use of livestock biodiversity. The new policy to be developed for the agricultural sector should take conservation of agro-biodiversity into consideration.

The Biodiversity Conservation Action Plan (BCAP)

The BCAP was prepared by the Ministry dealing with environment, with input from IUCN - the World Conservation Union and the USAID funded Natural Resources Policy Project (NAREPP), to meet national obligations under Article 6 of the CBD and to promote greater commitment in the country

for conservation and sustainable use of biodiversity. The BCAP preparation was supported by the Global Environment Facility (GEF), with a grant through the World Bank.

The preparation of the BCAP started in mid-1996, and the first draft was reviewed in April 1997. The document then went through several drafting stages and was approved by the Cabinet of Ministers on 27 August, 1998. The Ministry of Environment established and maintained a network of Biodiversity Liaison Officers in all stakeholder ministries, departments and agencies to facilitate the preparation of the BCAP during the mid-1990s. Through this network, as well as regular consultation with network members, the ministry kept stakeholder agencies interested in the BCAP process. In addition, the ministry conducted a series of awareness programs for state officials at various levels, commencing with the Secretaries of Ministries.

The preparation of the BCAP was preceded by the preparation of The Strategy for the Preparation of a Biodiversity Action Plan for Sri Lanka by the Ministry of Transport, Environment and Women's Affairs. This was completed in 1994.

While the BCAP was never implemented in a holistic manner, due to financial and technical inadequacies, there has been some follow-up action for compliance with some of its recommendations by the Biodiversity Division of the MOE. Among these activities are: (a) the setting up of a Legal Task Force to draft a suitable framework for regulating access to genetic resources and benefit sharing which can be translated into national legislation; (b) preparation of a code of ethics for biodiversity related research that involves the transfer of genetic material, or metabolites and other extracts of indigenous organisms out of the country; (c) preparation of national Biosafety Guidelines and a biosafety project; (d) initiating measures for the preparation of Action Plans for Combating Alien Invasive Species in selected protected areas, and (e) an Action Plan to conserve the biodiversity of domesticated indigenous species. In addition, several studies have been carried out to help the formulation of biodiversity related policy in the country.

An addendum to the BCAP has been prepared. Annex 5.1 provides more details on the status of enabling environment for biodiversity planning and integration of conservation and sustainable use into national planning.

In view of the importance awarded to biodiversity conservation, many other related institutions have also addressed the conservation of biodiversity in their sectoral plans and programmes; especially in the forestry, wildlife, coastal and marine, and agricultural sectors.

● **Coordination mechanisms**

Mechanisms under the Ministry of Environment:

The Ministry dealing with Environment monitors and coordinates the implementation of the National Environmental Policy and the Caring for the Environment 2003-2007- Path to Sustainable Development (i.e. the current National Environmental Action Plan or NEAP) and facilitates coordination and integration of environmental concerns into planning and development through six *Committees on Environment Policy and Management (CEPOMs)*. These represent six development sectors of the economy. These CEPOMs are linked to an apex Committee on Integrating Environment and Development (CIEDP) and to various sectoral agencies. The CIEDP is expected to address intersectoral environmental issues that arise through the CEPOMs, and to examine and provide policy directions on these issues. CIEDP members constitute Secretaries of line ministries that have an important bearing on the environment. The CIEDP is directly linked to the NEAP Steering Committee. The decisions taken by CEPOMS are expected to be conveyed to the sectoral agencies, and through the MOE to the National Environmental Legislation Enforcement Committee, the Provincial Councils and the Local Authorities. The CIEDP is non-functional at present.

In addition, the Ministry dealing with environment also has an inter-ministerial committee to facilitate inter-sectoral coordination. There are also various coordinating Committees established by the various divisions dealing with environmental matters; steering committees and technical committee to coordinate activities within its mandate. These cover various aspects of pollution control, biodiversity conservation and action on various international conventions to address country commitments. However, coordination is a critical problem in the environmental sector.

Inter-institutional coordination by CCD:

Inter-institutional coordination for policy level action is carried out through the Coast Conservation Advisory Committee. There are also national level coordinating committees for all major projects undertaken by the CCD as well as district level coordinating committees for such projects which notify relevant issues to the national level committees. In addition, there are Special Area Management Coordinating Committees which require inter-institutional coordination. Informal meetings between institutional representatives and relevant experts to discuss topical issues are effective. However, coordination to implement all the recommended actions in the Coast Conservation Action Plan (which are implemented by various organisations) is inadequate. There are overlaps in jurisdictional area with the UDA and MPPA, which sometimes creates confusion regards the implementing institutional mandate. Part of this confusion is due to misinterpretation of the statutes pertaining to mandate of institutions addressing various aspects of conservation and development in the coastal zone.

While CCD has inter-institutional coordination through the Coastal Zone Advisory Committees and the Special Area Management Coordinating Committee, this is not sufficiently effective to ensure the collaboration of all stakeholders for conservation of coastal biodiversity. The draft revision of the Coast Conservation Act (CCA) recommends an effective mechanism, but this law may take a long time to be finalised. This problem is compounded by the fact that coastal management issues are not restricted to the Coastal Zone, and often extend well into, or even beyond, the coastal region - defined in the CZMP 2000 (draft) as Divisional Secretaries' Divisions (DSD) with a coastal boundary. Similarly, activities in marine areas outside the Coastal Zone have definite impacts and implications for Coastal Zone management. This has necessitated that the CCD adopts an integrated resource management perspective through collaborative efforts with local communities and with state agencies having jurisdiction over coastal resources, or are engaged in activities that affect the Coastal Zone. Also coastal resource management planning has been based on the recognition that CCD is only one of many institutions that have jurisdiction over management of coastal resources, with limited capacity to directly manage the development activities affecting coastal resources and to influence coastal management activities of other organizations.

Inter-institutional coordination by the MPPA:

There are no major problems in coordination, although some conflict situation may have arisen due to overlaps in jurisdiction of the area under the MPPA and other institutions. For example, 2 km seaward from the shoreline comes under the jurisdiction of the CCD although this area is also within the jurisdiction of the MPPA. Similarly there are overlaps in research functions of the MPPA with the National Aquaculture Development Authority (NAQDA) and the National Aquatic Resources Research and Development Agency (NARA). The views of the MPPA and its concerns have always been incorporated and addressed in coastal zone planning. Coordination for contingency action by the MPPA, considered of vital importance by this agency, is still to be addressed.

Inter-institutional coordination by the UDA:

The planning committee of the UDA looks into all environmental aspects of urban development, which fall within and outside the coastal areas. (The UDA also acts as a Project Approving Agency for the NEA when appointed so by the CEA). There are also monitoring and coordination committees for each major project undertaken by the UDA (e.g. with the Board Of Investment [BOI]). Although these coordination mechanisms function well there is room for improvement. The most effective are the informal links between the UDA officers and other similarly placed officials who are known to them in other institutions (e.g. officials in the RDA, DWLC, etc.). This enables informal discussions for clarifications, etc., on matters which are of importance for decision making.^a A major problem is that junior officers who cannot take decisions on their own attend most inter-institutional coordination committees set up by the UDA.

Inter-institutional coordination by the DWLC:

The DWLC uses the Wildlife Advisory Committee in which government departments, universities and NGOs are represented to help formulate major decisions at policy level. The Wildlife Research

^a Note: the biodiversity network of middle level officers who could informally contact each other to confer and obtain information to facilitate implementation of the CBD and its country obligations established mainly for preparation of the BCAP in the mid 1990s is no longer in existence.

Committees coordinates research in the protected areas under the DWLC. Major donor funded projects implemented by, or for, the DWLC have consultations with the Director General of the DWLC. Inter- institutional coordination with the FD needs further strengthening through sharing of data, expertise and field level activity.

Inter-institutional coordination by the FD:

The Forest Department coordinates and approves research in forests under their jurisdiction through the Department's Research Advisory Committee. At the district level inter-institutional coordination occurs by the participation of the Department's District Forest Officers (DFOs) involved in forest management in the District Coordinating Committees (DCCs) and District Agriculture Committees which are attended by other regional institutions. The Forest Department also has village level coordination through Community Based Organisations (CBOs) established in the southern perimeter of Sinharaja world Heritage Site, around the Kanneliya Conservation Forest, in some villages adjacent to the Knuckles Conservation Forest and in 22 mangrove conservation forest patches from Puttalam to Hambantota. Most have medium to good stakeholder participation. Inter- institutional coordination with the DWLC is perceived as needing further strengthening at the field level in particular.

Coordination mechanisms to deal with wetlands:

The absence of a special institution mandated with coordination and propriety responsibility for wetlands was identified as a definite setback to the conservation and sustainable use of wetland biodiversity during the discussions on institutional aspects and capacity building for preparation of an addendum to the BCAP. This has been since remedied by the setting up of a special unit for wetland conservation within the CEA. Coordination of wetland activities are currently being done by the National Wetlands Steering Committee convened by the Ministry dealing with environment and the CEA. The NWSC has four task forces which deal with various aspects of wetland conservation, including wetland policy, and education and awareness.

● Legal instruments and regulatory mechanisms

Overall, there are over 80 laws enacted to conserve Sri Lanka's environment. The main enactments are summarised in the baseline report. The main laws governing environmental management and have a major impact on biodiversity conservation are given below. The Fauna and Flora Protection Ordinance (FFPO) amendment Act No. 49 of 1993 and the Forest Ordinance (FO) amendment Act No. 23 of 1995 are the main legal instruments that govern biodiversity conservation, including genetic resources, as at present. There have been periodic revisions of the Flora and Fauna Protection Ordinance (FFPO) and the Forest Ordinance (FO) to enhance protection of wild biodiversity. The FFPO besides protecting animal and plant life within the six categories of national reserves that it recognises has provision to protect certain identified categories of animals and plants (Protected Species) wherever they are found. The FFPO also states the penalties for violation of the law. Both the FFPO and the FO provide measures to control the export of wild biodiversity. The Fauna & Flora Amendment Act No 49 of 1993 by having in its mandate the words "protection against commercial exploitation" covers commercial access to indigenous genetic resources.

Several other acts enacted for fisheries management, plant protection and animals husbandry are also of relevance for conservation of indigenous fish, crop and livestock diversity and genetic resources.

Table 2.5: The main laws relating to environmental conservation and management in Sri Lanka

Legislation
The National Environmental Act No. 47 of 1980 and the amendment No. 56 of 1988.
The Forest Ordinance No. 16 of 1907, and its subsequent amendments
The Fauna and Flora Protection Ordinance No. 2 of 1937, and subsequent amendments including Act No. 49 of 1993.
Felling of Trees Control Act No. 9 of 1951.
The National Heritage Wilderness Area Act No. 3 of 1988.
Coast Conservation Act No. 57 of 1981, and the amendment No.64 of 1988.
The Fisheries and Aquatic Resources Act No. 2 of 1996.

Legislation
Marine Pollution Prevention Act No. 59 of 1981.
National Aquatic Resources and Development Agency Act No. 54 of 1981 National Aquatic Resources and Development Agency Act No. 54 of 1981
Soil Conservation Act, No. 25 of 1951; amended in 1996.
Agrarian Services Act No. 58 of 1979, and its subsequent amendments
Agrarian Research and Training Institute Act No 5 of 1972
Tea Small Holdings Development Act No 35 of 1975
Plant Protection Act No. 35 of 1999 (replacing Plant Protection Ordinance No.10 of 1924).
Water Hyacinth Ordinance No 09 of 1909
The Botanic Gardens Ordinance No. 31 of 1928
Control of Pesticides Act, No. 33 of 1980, as amended by No. 6 of 1994
National Zoological Gardens Act No 48 of 1981
Animal Disease Act No 59 of 1992
Flood Protection Ordinance No. 4 of 1924. Flood Protection Ordinance No. 4 of 1924.
The State Lands Ordinance No. 8 of 1947 and its two amendments.
Land Development Ordinance No.19 of 1935; and its subsequent amendments.
Colombo District (Low Lying Areas) Reclamation and Development Board Act of 1968, and the Amendment - Sri Lanka Land Reclamation and Development Corporation Act No. 52 of 1982.
Town and Country Planning Ordinance No.13 of 1946.
Housing and Town Improvement Ordinance, No.19 of 1950.
Urban Development Authority Law No 37 (?) of 1978, as amended by subsequent Acts, the recent ones being Act No. 44 of 1984 and Act No. 4 of 1992.
Mahaweli Authority of Sri Lanka Act No. 23 of 1979; and amendment 59 of 1993.
Mines and Minerals Act No. 33 of 1992.
Water Resources Board Act No.29 of 1964.
National Water Supply and Drainage Board Act No. 12 of 1974.
Customs Ordinance No. 17 of 1981
Antiquities (Amendment) Act, No. 24 of 1998.
National Museums Ordinance No. 31 of 1942.
The Intellectual Property Act No. 36 of 2003
Science and Technology Development Act No. 11 of 1994.

The overall policy in the country for environmental management is greatly influenced by the National Environmental Act (NEA) No. 47 of 1980 which was the first comprehensive piece of legislation on environmental management in Sri Lanka. Subsequent to this, Environmental Impact Assessments (EIAs) to all development projects were introduced in 1984 through a Cabinet decision. The concept of inter-generational justice and the principle that natural resources should be used in a sustainable manner for the continued enjoyment by present and future generations is recognised in the NEA. The NEA of 1980 also served to establish the Central Environmental Authority (CEA).

The NEA amendment Act No. 56 of 1988 makes legal provision for regulatory control of environmental pollution and to mitigate the adverse impacts of development activities through legally binding EIA procedures. It is therefore mandatory for all industries (including service facilities such as vehicle service stations) that are classified as low, medium or high polluting to obtain an Environmental Protection Licence (EPL) from the CEA. Part of this work has been devolved to the LAs. The NEA under section 24(c) permits environmentally sensitive areas to be declared. Developers in these areas should consult the CEA on the development plan for this area which specifies the types of development permissible in these areas. These plans have to be gazetted to be effective. The NEA, the FFPO and FO are equal in status, but these override other laws such as the CCA, the UDA Law and the Fisheries Acts.

The Coast Conservation Act No. 57 of 1981 and the Amended Act No. 3 of 1988 comprise the main

legislation which governs the coastal zone and development within this area. Apart from the CCA, the Coastal Zone Management Plan (which is empowered by the CCA) is the main instrument which influences implementation of programmes and enforcements in the Coastal Zone. According to the CCA of 1981 the Minister (in charge of the subject) may on the recommendation of the Coast Conservation Advisory Council make regulations to give effect to any provisions of the CZMP, including those which regulate use of the foreshore by the general public. Thus the CZMP is an important legal instrument once it comes into operation when gazetted after receiving Cabinet approval.

The Fisheries Act No. 2 of 1996 addresses measures for "protection of fish and other aquatic resources" (i.e. the Fisheries Act covers all aquatic organisms (which include inland, coastal and marine animals and plants which are collectively defined as "fish"). The Fisheries and Aquatic Resources Act deals with ownership marine and inland aquatic resources, but does not override the provision of the FFPO and the FO.

The Marine Pollution Prevention Act No.59 of 1981 provides for the prevention, reduction and control of pollution in Sri Lankan waters, and for giving effect to international conventions to which Sri Lanka is a signatory to for the prevention of pollution of the sea.

The Urban Development Authority Law No. 41 of 1978 and its amendments amongst other matters covered in it, promotes the integrated planning and implementation of social, economic and physical development of areas declared as "Urban Development Areas". This Act also provides for the development of environmental standards and schemes for environmental improvement in areas identified as UDA areas.

Although it has been felt that the introduction of alien invasive species and biosafety are not adequately covered by national law, legal interpretations suggest that this aspect is covered with the existing laws (e.g. The Plant Protection Act, the Water Hyacinth Ordinance and the Animals Disease Act). Biosafety can in addition be addressed through the Control of Pesticides Act, Consumer Affairs Authority Act No. 9 of 2003, and the Food Act, No 26 1980 amended by Act No 20 of 1991.

Sri Lanka has also enacted the Intellectual Property Act No. 36 of 2003. This law relates to all the different types of intellectual property rights in Sri Lanka and provides the procedures of registration, control and administration of such rights. It is also relevant for granting IPR protection in the use of genetic resources and for genetic engineering techniques and their products.

● **Legal aspects governing Environmental Impact Assessments**

The NEA amendment Act No. 56 of 1988 empowered the CEA as the regulatory authority with legal provisions to control environmental pollution and to mitigate the adverse impacts of development activities through legally binding EIA procedures for certain prescribed projects. Under the NEA, prescribed development activities within 100 m from the boundary of any protected area requires an EIA. Similarly, the DWLC can request an EIA for developmental activities in areas within one mile from the boundary of any National Reserve declared under section 2 of the FFPO. Under the Coast Conservation Act No. 57 of 1981 (the CCA), the Director Coast Conservation has the discretion to call for an EIA from both private and state agencies, and for any development activity that falls entirely within the Coastal Zone, although most EIAs requested by the Director are only for prescribed projects listed in the NEA of 1988. Once a developer submits an EIA to the CCD, the CCA requires that the EIA be referred to the Coast Conservation Advisory Council for comment during a 60-day period. Once a developer submits an EIA to the CEA or the DWLC, these agencies call for public comment during a 30-day period. Under the NEA, the CCD (for any prescribed development project in the coastal zone), UDA, FD and DWLC are named as project approving agencies (PAAs).

● **Legal aspects governing ownership of natural resources**

"Sovereign rights" over natural resources (including genetic resources) is enshrined in the Constitution of the democratic Socialist Republic of Sri Lanka in both Articles 27 (Directive Principles of State Policy) and 28 (Fundamental Duties). But though sovereignty is given to the State in this regard, it is vested in the hands of the people and the state cannot contravene the interests of citizens of the country. This means that the "State shall hold all Natural Resources in guardianship for the people and ensure that it be used in a cautionary manner."

The Fauna and Flora Protection Ordinance (FFPO) amendment Act No. 49 of 1993 and the Forest Ordinance (FO) amendment Act No. 23 of 1995 form the main legal framework pertaining to biological resources, including issues of ownership and providing access to genetic resources. The FFPO implies that the State holds responsibility over all natural resources and holds ownership of these resources.

● Adequacy of the legal framework

There are adequate legal instruments, policies and/or non-regulatory mechanisms to address the requirements of the CBD bar a few gaps. The Laws for conservation of indigenous biodiversity are adequate. The laws that govern providing external country parties access to genetic resources have adequate flexibility of interpretation to regulate access, and with regulations can effectively enable benefit sharing with the state. Laws that cover the entry of alien species and biosafety also have adequate flexibility of interpretation and their coverage can be made more effective through future regulations.

While some laws do overlap, this is not an insurmountable problem and there are no contradictions that will seriously preclude conservation of biological diversity. On the other hand, there are serious lapses in the interpretation of laws by various individuals and projects relating to biodiversity conservation. While there are a few individuals who are well versed in these laws, they are not always consulted during the early stages of amending the existing laws or drafting new laws. As a result of this seeming lack of transparency and poor consultation of appropriate individuals at the early stages of formulating laws, draft laws are sometimes deemed unnecessary and later withdrawn after much time, effort and funds have been expended. It is noteworthy that all major projects concerning biodiversity conservation engage in the analysis of existing laws pertaining to biodiversity conservation, but there is considerable divergence and inconsistencies of interpretation of the same law. As such the requirement is for (a) better awareness to create understanding of existing laws by biodiversity managers and policy planners; (b) the general public should be made more aware of IPR as relevant to use and sharing of biodiversity related knowledge and information.

The main gaps in the legal framework:

The main gap is the absence of legal measures to enable equitable benefits to the holders of traditional knowledge when such information is used in combination with genetic resources or for sustainable use of other components of biodiversity by others - including both in- country or external Parties. There is no law or mechanism to protect ownership of such traditional knowledge in the first place, which is essential to facilitate benefit sharing as requested by the CBD. It should, however, be noted that ownership of traditional knowledge at the individual level is very difficult to address and is compounded by the fact that any information in the public domain cannot be claimed by any particular individual or county. However, the issue of individuals' rights over traditional knowledge and ensuring benefits from the use of such knowledge by others is not addressed by the existing legal framework and should be addressed by a legal panel and scientists with sufficient experience in the area. Possible *Sui Generis* systems have not been explored or attempted as yet. The existing laws are also thought to be insufficient to address wetland issues.

There are deficiencies in the:

- Mines and Minerals Act No. 33 of 1992 as the offences under it are not cognizable. Hence law enforcement authorities do not have adequate powers to enforce some of these laws.
- NEA in respect of EIA procedures for mining and prevention of biodiversity loss.

Further, the field officers of the CEA are constrained due to inadequate delegated authority. The general public are also not familiar with environmental laws and citizens rights in this regard. There is inadequate trained manpower in the Police Department, and an overall inadequacy of logistics in all relevant departments, for effective enforcement of environmental laws at all levels, as well as external interference that precludes efficient law enforcement.

Time should not be wasted in formulating new laws, and all efforts should be channelled for the effective enforcement of existing laws. The considerable inadequacy for law enforcement should also be addressed at the institutional level.

● International commitments with impacts on biodiversity conservation

The overall political commitment to environmental conservation in Sri Lanka is also reflected in the ratification of 37 Multi-lateral Environmental Agreements (MEAs) (given as Annex 2 of the baseline report). These include the three Rio Conventions: the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biodiversity (UNCBD), and the United Nations Convention to Combat Desertification (UNCCD), ratified by Sri Lanka in 1993, 1994 and 1998 respectively. Several have direct or indirect impact on biodiversity conservation. These include the Basel Convention on Control of Trans-boundary Movement of Hazardous Wastes, the Montreal Protocol to Control the Use of Ozone Depleting Substances, the Ramsar and CITES conventions and the United Nations Convention on the Law of the Sea (UNCLOS) ratified by Sri Lanka in 1994. Sri Lanka acceded to the MARPOL Convention (for the Prevention of pollution from ships) in 1997. A number of activities and programmes have been taken place to facilitate obligations under each convention.

BOX 2.2

WTO provisions and trading principles

The WTO Agreement covers around 29 legal texts -covering everything from agriculture to clothing, and from services to government procurement, rules of origin and intellectual property. There are other ministerial declarations etc. which spell out obligations and commitments for WTO members. Several fundamental principles run through these instruments which together make up the multilateral trading system. These principles include:

- Trade without discrimination:
 - According to Article 1, the most-favoured-nation (MFN) treatment clause, members are bound to grant the products of others members treatment that is no less favourable than that accorded to the products of any other country. Thus no country can give special trading advantages to another or to discriminate against it. All are on an equal bases and all share the benefits of moves towards lower trade barriers. Exceptions are customs unions, and free-trade areas. MFN is expected to ensure that developing countries benefit freely from the best trading conditions.
 - "National treatment" requires that once goods enter the market, they must be treated no less favourably than the equivalent domestic products.

Apart from the Revised GATT of 1994, several other WTO agreements contain important provisions relating to MFN and national treatment.

Source: Trading into the future WTO the World Trade Organisation²⁸

Sri Lanka signed the Cartagena Protocol on Biosafety on 24 May 2000, during the fifth meeting of the Conference of Parties to the Convention on Biological Diversity in Nairobi, Kenya, when it was first opened for signatories. The country ratified the Cartagena Protocol on 28 April 2004 and consequently the Protocol has entered into force in the country on 28 July 2004 with the Ministry dealing with Environment as the Focal Point for this protocol (as with the CBD).

Sri Lanka has made national commitments to the international community by adopting Agenda 21 and Rio Principles of the United Nations Conference on Environment and Development (UNCED) during the Rio Earth Summit in 1992. Sri Lanka is also considering the ratification of the Convention on Ballast Water* and the Convention for Oil spill preparedness and response Cooperation (OPRC).

The government of Sri Lanka is also committed to monitoring of Millennium Development Goals (MDGs) at a national level with the support of various Ministries and UN agencies. The NSCA project supports achieving Sri Lanka's targets for the MDGs. There is concern that Sri Lanka has not taken adequate heed of Agenda 21.

* It is not clear as yet whether Sri Lanka is in danger of alien invasive species from ballast water, as most ships that call over here are on their way from a south Indian Port. In which case the ballast water that arrives here is from the Indian Ocean, and the threat of alien species arriving from another region could be minimal.

With regard to implementing Articles 15 and 16 of the CBD, there are implications from the WTO and its trade related conventions to which Sri Lanka is a signatory to. For example, if a national Access Law ever comes into force, it stands on its own and can be given different interpretations in terms of obligations under the WTO Trade Treaties (under most-favored- nation treatment and national treatment). The CBD promotes providing access to genetic resources and benefit sharing as an incentive to induce biodiversity rich developing countries to conserve biodiversity. Also the CBD gives the discretion to national governments to negotiate benefit sharing mechanisms and fair and equitable terms, and to refuse access if the access request or intended use, runs counter to the objectives of CBD or are not environmentally sound. Thus, despite the fact that COP to the CBD has affirmed that the WTO provisions do not run counter to the CBD, concerns have been expressed by informed parties that if a special access law is ever enacted in Sri Lanka such a law may run counter to the objectives of Article 15 and the spirit of the CBD. This has been discussed in detail at the workshop on access held under this project.

Sri Lanka has also not adequately considered the impact of IPR covering the commercial use of indigenous (especially endemic) genetic resource and related traditional knowledge in relation to international law on IPR and patents.

BOX 2.3

WTO agreement on TRIPS

The WTO agreement on Trade Related Property Rights (TRIPS) recognises widely varying standards in the protection and enforcement of intellectual property rights. Part I of the agreement sets out general provisions and basic principles: notably a national treatment commitment under which nationals of other members must be given treatment no less favourable than that accorded to a member's own nationals with regard to the protection of intellectual property. It contains a most-favoured-nation clause under which **any advantage a member gives to the nationals of another member must normally be extended to the nationals of all other members**, even if the treatment is more favourable than which it gives its own nationals.

With regard to copyright, the TRIPS agreement ensures that computer programmes are protected as literary works, under the Berne Convention, and outlines how databases should be protected.

Regarding patents, TRIPS requires that 20-year protection be available for all inventions, whether products or services, in almost all fields of technology. Inventions may be excluded from patentability if their commercial exploitation is prohibited for reasons of public order or morality. The permitted exclusions are for diagnostic, therapeutic and surgical methods, and plants and animals (other than micro-organisms) and essentially biological processes for the production of plants and animals (other than micro-biological processes). This makes granting of patents to plants and animals optional, while granting of patents to micro-organisms (which are not defined) is obligatory. Plant varieties must be protected either by patents or by a *sui generis* system (such as a breeder's rights provided in the International Union for the Protection of New Varieties of Plants (UPOV) or a combination of both. Rights conferred in respect of patents for processes must extend to the products directly obtained by the process; and infringers may be ordered by court to prove that they have not used the patented process.

Source: Trading into the future WTO the World Trade Organisation²⁸

Sri Lanka is also in the process of scrutinizing the legal implications of the FAO undertaking on access issues and the impact of the International Treaty on Plant Genetic Resources (ITPGR) and Intellectual Property Rights and Plant Breeders' Rights.

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Chapter 3

METHODS FOLLOWED

3.1 The process

The thematic assessment of the NCSA project has built on the activities carried out during the inception process and the baseline survey. At the inception of the project a brainstorming session helped to identify potential stakeholders that should be consulted during the baseline appraisal and the biodiversity thematic assessment.

TABLE 3.1: Stakeholders* for implementing the CBD and BCAP at the national level

Primary Stakeholders:	Secondary stakeholders:	
	Group (i)	Group (ii)
State institutions mandated/responsible for some aspect of implementing the CBD and BCAP	Institutions/organisations (state or other) with no definite mandate for biodiversity conservation in terms of implementing articles of the CBD and the recommendations of the BCAP, but are involved in, or have a major role to play in, implementing them.	Institutions/organisation s/distinct stakeholder groups that had no mandate, or major interest in biodiversity conservation <i>per se</i> , but have a definite impact on implementing articles of the CBD and/or the recommendations of the BCAP as "impactors" or "users" of components of national biological diversity.
Ministry of Environment and Natural Resources Ministry dealing with indigenous medicine Ministry of Foreign Affairs Ministry of Agriculture, Lands, Livestock & Irrigation Ministry dealing with fisheries and aquatic resources.	Ministries dealing with: Plantation industries; Trade; Science & Technology; Power & energy; Education and relevant institutions under it; Tourism; Finance and planning; Urban development water supply.	Ministry dealing with health
Forest Department (FD) Department of Wildlife Conservation (DWLC) Department of Ayurveda National Zoological Gardens (NZG) The National Botanic Gardens (NBG) Central Environmental Authority (CEA) Department of National Museums Department of Export Agriculture (DEA)	Universities & other academic/research Institutes (for education and research) Council for Agricultural Research Policy (CARP) Bandaranaike Memorial Ayurvedic Research Institute (BMARI) Industrial Technology Institute (ITI) Sri Lanka Standards Institute (SLSI) Mahaweli Authority of Sri Lanka (MASL) Geological Survey and Mines Bureau (GSMB) Department of National Planning Urban Development Authority (UDA)	Institutions dealing with tourism Department of Small Industries State Timber Cooperation (STC) Institutions in the transport sector Institutions dealing with power and energy

Primary Stakeholders:	Secondary stakeholders:	
	Group (i)	Group (ii)
Department of Animal Production & Health (DAPH). Department of Agriculture (DOA) and associated research institutions (FCRDI, HORDI, SCPPD, RRD, etc.) plus other divisions under it. Plant Genetic Resources Centre (PGRC) - also under the DOA, but with special role for <i>ex-situ</i> conservation Coast Conservation Department (CCD) Dept of Fisheries & Aquatic Resources (DFAR) National Aquatic Resources Research and Development Agency (NARA) Marine Pollution Prevention Authority (MPPA) Sri Lanka Customs Attorney General's Department. Legal Draftsman's Department National Science Foundation (NSF) Coconut Research Institute (CRI) Tea Research Institute (TRI) Rubber Research Institute (RRI) Sugarcane Research Institute (SRI)	Meteorological Department. Sri Lanka Land Reclamation Development Authority (SLRDA) National Aquaculture Development Agency (NAQDA) Sri Lanka Ports Authority (SLPA) Police Department Department of Censes & Statistics Registrar of Patents and Trademarks Registrar of Pesticides Community Based Organisations (CBOs) Environmental NGOs: National NGOs such as EFL, Green Movement, Sri Lanka Nature Forum, Organization for Resource Development & Environment (ORDE), etc. (these names were submitted by the participants present, but it was agreed that other key NGOs should be identified later) IUCN - The World Conservation Union Sri Lanka office (as a local level NGO). Media institutions -(press, T.V., radio) Journalists' fora. Provincial Councils (PCs) District/Divisional Secretariats Local Authorities (LAs)	Private Sector - possibly targeted via the Chambers of Commerce Industries (some will be included above) Civil Society - possibly targeted through civil society organizations.

* Other institutions listed in the BCAP (1998) and Report of Task Force 11 on Institutional Aspects and Capacity Building for preparation of the addendum to the BCAP (2004) :Tea Small Holdings Development Authority, Rubber Development Authority, Coconut Cultivation Board; Land Reform Commission (LRC), ICTAD, NBRO are identified under the B (2).

Following a detailed analysis of national obligations under the CBD (Appendix 1.1), a broad framework was developed for the 'stocktake' or baseline appraisal and the biodiversity thematic assessment with inputs from the biodiversity thematic advisory group.

Desk research was carried out on (a) past capacity building exercises and capacity assessments of relevance for meeting national needs under the CBD and (b) existing national capacity needs identified for biodiversity conservation. The latter drew heavily on capacity needs assessments carried out under (a) various biodiversity related projects, (b) the BCAP, which is the currently available published document with cabinet approval) which reflects national actions to fulfil obligations under CBD as relevant to Sri Lanka, and (c) individual thematic taskforce reports which contributed towards preparation of the draft addendum to the BCAP. The latter included the report of Task Force 11 which dealt specifically with capacity building for *in-situ* and *ex-situ* conservation and integration of biodiversity concerns into other sectors. Among the other main documents consulted were Caring for the Environment 2003-2007 - Path to Sustainable Development; the Coastal Zone Management Plan of 2004; Reports on the implementation of the Coastal Resources Management Project, and the State of the Environment in Sri Lanka: A national Status report

prepared for SAARC, the Forestry Sector Master Plan and individual project reports on capacity building and capacity assessment project reports.

A postal questionnaire survey followed by telephone calls served to obtain up-to date information on institutional arrangements and mandates, major capacity building exercises and existing capacity to fulfil obligations under the CBD. A set of three comprehensive questionnaires that were self-explanatory and involved mainly ticking the correct answers were developed by the thematic consultant (Appendix 3.1). These were pilot tested on the members of the Biodiversity Thematic Advisory Group. The comments received were used to make the questionnaires more user-friendly. The finalised questionnaires were mailed to 84 institutions identified as primary and secondary stakeholders during the initial stakeholder analysis (Appendix 3.2) and followed up with telephone calls by the NCSA project management office staff. The postal questionnaire survey was delayed due to the postal strike which came into effect immediately after the questionnaires were sent out. The institutions that provided information through the postal survey are given in Annex 3.1). There was 34% response to the postal survey. A further 11 institutions that did not respond were contacted during the institutional visits by the thematic consultant. Several key institutions that did not respond to the questionnaires were contacted by the thematic consultant during the institutional visits and the required information was obtained.

Institutional visits were made by the thematic consultant to 27 institutions, agencies and NGOs identified as having a mandate, mission or responsibility to promote biodiversity conservation (Annex 3.1) as a follow-up to the questionnaire survey. Almost all the key institutions with a major responsibility for *in-situ* or *ex-situ* biodiversity conservation were visited by the Thematic Consultant even if they had complied with the postal questionnaire survey. Capacity needs of these institutions to carry out their mandated functions in respect of biodiversity conservation - especially in the priority areas - were discussed. The efficacy of recent capacity building efforts considered relevant for biodiversity conservation and sustainable use was also discussed (this has also been invested through the questionnaire survey). Some of the visits made were relevant for the baseline survey as well as for the thematic assessment. Overall a total of 18 state institutions (including a university), three NGOs and two media institutions were visited and four visits were made for discussions with donor funded project staff (including two expatriates).

Recent information gained on capacity for environmental governance in Sri Lanka through institutional visits (to FD, DWLC, MOE, CCD, UDA, MPPA, CEA, Ministry dealing with Land) made in March 2005 by the thematic consultant on biodiversity for a project carried out by the Public Interest Law Foundation (PILF) was used with the permission of PILF. However, much of this information was updated via the institutional visits and the questionnaire survey under the NCSA.

The detailed client survey as recommended by the NCSA (Resource Kit, October 2004) was done through the questionnaire survey and visits which covered the institutions which emerged through the stakeholder analysis at the inception. Clients have been defined for the NCSA Project as those who will need support through the NCSA (i.e. beneficiaries of the NCSA). As suggested in this document, a list of agencies and individuals who attended the various biodiversity thematic meetings, along with their contact numbers and e-mails was prepared by the NCSA project office.

The linkages survey was carried out during the institutional visits and the consultative meetings and workshops held during the Thematic Assessment. The linkages survey has been recommended to identify as to how the NCSA can be linked to other processes with mutual benefit. For example, the linkages survey should indicate the programmes and projects and plans that are related to the NCSA and their descriptions; possible linkages with the NCSA, specific entry or linkage points - including individuals responsible for those programmes. Accordingly, many of the consultation meetings were held in collaboration with, or were organised by, potential beneficiaries or linkage institutions (i.e. National Science Foundation, the Man and the Biosphere National Committee, Forest Department, state media, Environmental Foundation Limited (an NGO), Open University and the Colombo West Rotary Club).

The consultative meetings held with specific stakeholder groups for the thematic assessment are given in Table 3.2.

● Capacity assessments for prioritised areas

The thematic assessment sought to ascertain the capacity development needs at systemic, institutional and individual level following guidelines given in Boxes 1.1, 1.2 and 1.3, and in keeping with the expected outcomes of the NCSA project given in Box 3.2.

BOX 3.1

Indicators for quality of outcomes and impacts of the NCSA Capacity building Action Plan

Contribution to socio-economic development

NCSA action plan proposes measures to improve management of environmental uses and contributes to national development priorities.

Improved negotiation skills

The NCSA final report and action plan are used to negotiate with donors for technical cooperation and capacity development

Enhanced cross-sectoral coordination

NCSA helps to build a more cooperative relation between ministries and agencies

Involvement of non-governmental organisations

NCSA strengthens the NGO roles and contributes to capacity development and environmental management.

Established culture of self-evaluation

NCSA helps establish culture of self-evaluation and problem solving.

The responses to the questionnaires, interviews and the desk research were used for the selection of priority areas for capacity building to meet national obligations under the CBD to meet the Convention's objectives of biodiversity conservation, sustainable use and equitable sharing of benefits from genetic resources.

The prioritized thematic areas for capacity building are given in Table 3.3. Many of these have also been prioritized in the BCAP or the addendum to the BCAP as important to stem biodiversity loss or for management of biodiversity components, but have not been addressed as yet in the required scale. Hence there was low capacity to address these issues in the near future without further capacity building. Prioritisation was done through a subjective qualitative analysis of capacity for a range of overall capacities required to fulfil obligations under each of the CBD articles. The first cut of capacities were identified by examining whether any critical BCAP recommendations (made in 1999) that were necessary to fulfil obligations under articles 6-20 had not been addressed by 2003 due to capacity constraints at the time of preparation of the addendum (in 2003) or during the preparation of the National Environmental Action Plan (CFE) prepared (in 2003), and whether the lack of capacity to address these actions were severely hampering achieving the three main objectives of the CBD. These were then examined to see whether there had been previous capacity building among the main stakeholders responsible for implementation [B], disability of these stakeholders to achieve goals with existing capacity [d], the urgency of capacity building in terms of the need to stem biodiversity loss or enable fair and equitable benefits at national level (d), and national relevance as opposed to regional or local relevance (NR). All capacity needs for the shaded prioritized areas in Table 3.3 have been investigated in detail through the NCSA assessments.

The prioritized areas were also checked during interviews for institutional survey. At each workshop held to identify specific capacity needs in these priority areas, the participants were asked to comment on whether the issues for discussion were priority areas for capacity building and whether there were any other areas that could be suggested. *One area identified for capacity building was rejected as a priority need at the consultative meetings: this was the need for capacity building among varied stakeholder groups for application of the ecosystem approach to conservation.* As a capacity analysis had been done during the preparation of the Addendum to the BCAP in 2003 a separate stakeholder consultation was not repeated to prevent consultation fatigue. This was

especially important as the same group had been involved in a stakeholder identification for the NCSA and were necessary to be consulted for detailed capacity assessments of prioritized areas.

The prioritized areas were investigated in detail during a series of structured roundtable meetings/mini-workshops for selected stakeholders groups (Table 3.2) to identify very specific capacity building needs so as not to duplicate the broader recommendations in the BCAP and Addendum. The thematic areas prioritized were checked with the Thematic working group on biodiversity.

The capacity assessments were done at three levels of social organization: at the *individual level* on what the available human resources could do, at the *institutional* on what could be done at the collective level, either as an institution or as an organised group; and at the *systemic level* on what could be done as the larger system of group function.

Participants at these meetings are given in Annex 3.1. For each meeting, customised materials (i.e. information notes, PowerPoint presentations, and/or brochures) were prepared after consideration of the issues to be addressed and the knowledge and interests of the groups. These served to apprise the participants of the objectives of the meeting as well as to 'seed' the discussion by providing background information on the priority areas to be discussed. The workshop on Access to Genetic Resources and Benefit sharing required a prior understanding of the adequacy of legal requirements for a national ABS regime. This was a prerequisite to understand whether an access law was a requirement at the systemic level or whether the existing legal framework provided adequate regulatory coverage. The adequacy of the present legal framework were examined in detail by a group of lawyers, the project manager and the thematic consultant at three meetings prior to reaching a conclusion on this matter. A paper was prepared as the outcome of these meetings which was presented at the workshop on access to genetic resources and benefit sharing as a basis for the workshop discussions and for identification of other capacity needs. Reports of individual roundtable meetings and mini-workshops are given as separate documents.

To better enable the NCSA project to address the expected outcomes in conformity with the requirements given in Boxes 3.1 & 3.2, several of the consultative meetings/workshops were held in partnership with organisations that had a stake in capacity building in the priority areas under discussion and were either linkage institutions or beneficiaries (or both). This complied with the need to promote linkages between the NCSA and other existing programmes to help operationalise the NCSA Action Plan. Consequently, some meetings /workshops were held in collaboration with partner organisations (i.e. the National Science Foundation (NSF) and the Forest Department). In other instances the thematic consultant participated in meetings organised by other groups such as the Colombo West Rotary Club (representing civil society), the Forest Department, the Rupavahini Corporation, the Open University and the Environmental Foundation Limited (EFL). The level of awareness and understanding within government, private sector and the general public concerning issues related to CBD (and especially for the prioritised areas) were ascertained during institutional visits and the various meetings/workshops.

To facilitate the consultative processes, various methods were used:

- Where possible small groups were used for the thematic assessments. This also helped to identify specific entry points for the NCSA, and linkage institutions that can help operationalise the NCSA.
- Customized materials (presentations and information notes) were prepared for each workshop/meeting to better focus the workshop discussions, to enable the participants to prepare for the workshop, and to facilitate sharing of information. This way the need to use targeted briefings, brochures and information notes (suggested by the resource Kit) was addressed.
- A colourful and informative brochure in simple language (low cost, prepared by the thematic consultant and printed in-house by the NCSA project) was given out to attract potentially "unwilling" participants who were not in the conservation field.
- Representatives of larger groups (Colombo West Rotary Club) or samples of larger groups (business sector, legal sector, NGOs) were used to keep the groups small but to get diverse stakeholder view points.

- The ecosystem approach was used as an umbrella to check capacity on several priority areas so as to assess capacity for application of the ecosystem approach along with the priority issues.
- The meeting to discuss cross-sectoral support for biodiversity conservation sought the support of senior staff from international organizations (IUCN regional Office). The presentations targeted how biodiversity conservation can help alleviate poverty.

BOX 3.2

Levels of capacity assessment and indicators

Individual level

- Continuous (on the job) and incremental learning ; Skills development;
- Formal and informal training;
- Access to information
- Adequate incentives and wages and transparent career advancement
- Accountability and feedback
- Participation in decisions and understanding individual role and functions;
- Ability to organise, build consensus, monitor and evaluate in a participatory manner.

Entity/Institutional

- Clear vision and mission and strategy
- Policies and values
- Competencies and structures
- Processes and systems and transparency (openness)
- Human and physical resources
- Well functioning evaluation system
- Financial resources

Systemic level

(Capacity development requirements at the highest level and addresses the needs of the larger system: e.g. themes, sectors and geographic boundaries.

- Policies, strategies and legislation.
- Interrelationships between entities.
 - Organisations and groups interact with other for a common purpose. This can be seen as a system.
 - Themes, sections, institutions and geographic divisions comprise one or more systems where entities interact for a common purpose.
- Enabling environment.
 - Institutional context
 - Sociopolitical context (includes gender roles and political commitment)
 - Economical context (including markets and formal and non-formal private sector and macro-framework).
 - Environmental context

(Source: National Capacity Self-Assessment Resource Kit, Global Support Programme, 2005).

- Experts in the specific areas addressed by roundtable meeting and mini-workshops were invited to brief the participants on existing capacity and to “seed” the discussions. Thus the thematic assessment meetings also built capacity among participants so that they could participate meaningfully in the identification of capacity needs and to achieve the expected outputs from the meetings.
- All workshops and meetings for priority issues targeted the relevant CBD articles and actions recommended in the BCAP/addendum on that issue.
- Getting high-level support from policy makers has not been attempted as yet, but it is vital that this be done during the final stage of the NCSA project for identification of activities for capacity building within this group.

TABLE 3.2: Schedule of consultative meetings held with specific stakeholder groups

Meeting	Target group
Roundtable to discuss capacity development in Sri Lanka for biotechnology using indigenous genetic resources. (Report BTAWR 1).	State Institutions, research institutions, business and individuals working on biotechnology using genetic resources
Roundtable Meeting to discuss the Participation of the Private Sector in the Conservation and Sustainable Use of Biodiversity. (Report BTAWR 2).	Selected business institutions dealing with use of biological resources and held at the National Chamber of Commerce.
Three meetings to identify capacity needs and legal aspects of providing access to genetic resources and benefit sharing. Paper prepared and presented at the workshop on ABS (Included in Report BTAWR 3)	Legal experts in the environmental field as well as non-environmental lawyers.
Workshop on Capacity Building Needs to Ensure Benefits from providing Access to Genetic Resources. (Report BTAWR 3)	All major stakeholders that would be involved in providing access to genetic resources and its control and regulation
Roundtable on Media Involvement to Implement the Convention on Biological Diversity (Report BTAWR 4)	Journalists, Sri Lanka Environmental Journalists' Forum
Meeting on CBD objectives and capacity for media involvement (organised by SLRC)* (Report BTAWR 4)	Programme directors at the Rupavahini Corporation
Workshop on information management and exchange: meeting the objectives of the CBD (organised in collaboration of the National Science Foundation)* (Report BTAWR 5)	Information managers (including NGOs), users (academics) and possible linkage institutions.
Roundtable Meeting on Setting the Stage through <i>In-situ</i> and <i>ex-situ</i> Conservation for adopting the Ecosystem Approach. (organised in collaboration of the National Science Foundation/MAB National Committee)*	All state departments with major responsibility for <i>in-situ</i> and <i>ex-situ</i> conservation, institutions that impact on management of biodiversity and selected NGOs.
Roundtable Meeting on Capacity building for obtaining cross-sectoral support for biodiversity conservation - adopting the Ecosystem Approach. (organised in collaboration of the National Science Foundation/MAB National Committee).*	Main state departments in other sectors (i.e. other than institutions responsible for conservation) that need to support biodiversity conservation, selected NGOs, and key state institutions mandated with <i>in-situ</i> conservation.
Field trip to Kanneliya Forest Reserve organised by the Forest Department* for: (a) discussion on capacity building for application of participatory conservation of forests at the regional and local levels.	Assistant Conservator of Forests (headquarters), the Galle DFO, Kanneliya Forest Reserve field staff and Hiniduma North CBO members.
(b) session with Assistant Conservator of Forests (head quarters), the Galle DFO and Kanneliya Forest Reserve field staff on setting up and maintaining visitor centres and capacity requirements for enhancing interpretive services at the Kanneliya Forest Reserve (as a sample forest reserve). Assessment of existing capacity. (Wildlife reserves had been covered previously by the thematic consultant on previous assignment under the PAM&WC project)	Assistant Conservator of Forests (headquarters), the Galle DFO.

Meeting	Target group
Field trip to Galgamuwa for meeting and site visits to discuss application of participatory management of biodiversity at the regional and local levels - and capacity needs to adopt this approach successfully. Organised in collaboration with the National Science Foundation/MAB National Committee and the Forest Department. (The community set the agenda for the meeting).	Selected field officers of FD, DWLC, DOA and NARA, involved in local level participatory management of ecosystems, selected National NGOs working at local level, communities, local regional administrative officers active in this field, state organisations working for livelihood development. (CCD, DFAR and CEA were also invited)
Address at lunch time meeting of the Colombo West Rotary Club and a discussion on capacity for conservations and sustainable use of genetic resources among civil society and the private sector. (A forum organised by the Colombo West Rotary club - a linkage institution).	Responsible senior members of civil society
Presentation on Ecosystem Approach to conservation to CEA officers and questionnaire session on capacity building needs for applying the EA and to manage the environmental Protection Areas declared under the NEA (including law enforcement), Organised by the Environment Division of the Open University.*	Mid professional level Environmental Officers of the CEA, at lecture.
Capacity building for communicating biodiversity conservation	Junior staff of MOE and staff of selected NGOs and state sector institutions (sample)
Assessing capacity building for communicating biodiversity conservation - and discussion on NGO capacity building needs for biodiversity conservation. Organised by the EFL*	EFL staff (on request)

*held in collaboration with a linkage institution and/or beneficiary for capacity building

TABLE 3.3 Prioritization of capacities required to fulfill obligations under the CBD (Articles 6-20) for further investigation

Capacity Needs (BIODIVERSITY CONSERVATION) [A]	Scale of effort to raise current level to "sufficient" (1-3) [B]:	Scale of prioritization** (1-5, lowest to highest) [C]			[B] x Σ [C] score	Comparative Priority Scale (the lower the number the higher the priority) [D]
		D	U	NR		
Capacity to reach sectoral and cross-sectoral support to mainstream biodiversity conservation and sustainable use in accordance with the ecosystem approach.*	3	5	5	5	45	1
Capacity to communicate, educate and create public awareness on the importance of biodiversity for sustainable development to mobilize commitment and participation for biodiversity conservation.	3	5	5	5	45	1
Capacity to develop and introduce measures and mechanisms for a national Access (to genetic resources) and Benefit Sharing (ABS) regime which ensures fair and equitable benefit-sharing from such use, including benefits to traditional knowledge holders.	3	5	5	5	45	1
Capacity to negotiate to fulfil national needs for biodiversity conservation and sustainable use at CBD COP and other global fora.*	3	5	5	5	45	1
Capacity to develop and implement national policy frameworks, plans and programmes on biodiversity conservation and sustainable use with cross-sectoral support.*	3	4	5	5	42	1
Capacity to establish an effective inter-institutional coordination mechanism for identification and monitoring of critical components of biodiversity and threats to biodiversity.*	3	4	5	5	42	6
Capacity to implement a multi-institutional coordinated effort to identify, design and establish a rational network of areas needing protection in accordance with the ecosystem approach to biodiversity conservation.*	3	4	5	5	42	6
Capacity to design, develop and implement multi-stakeholder participation for species specific <i>in-situ</i> and <i>ex-situ</i> conservation measures to promote conservation, management and recovery of threatened species and sustainable use of commercially important species.	2	5	5	5	30	8
Capacity for agencies responsible for <i>in-situ</i> conservation to institutionalise participatory and integrated management of ecosystems and their bioresources as consonant with the ecosystem approach and poverty eradication.*	2	4	5	5	28	9

		Scale of prioritization** (1-5, lowest to highest) [C]				
Capacity to design, develop, share, maintain and manage relevant information and data management systems to support biodiversity conservation action within the country and to access biodiversity information from external sources.*	2	3	5	5	26	10
Capacity to develop and introduce measures to enhance national capacity for biotechnology using genetic resources	2	3	5	5	26	10
Capacity to develop and enforce legal and regulatory frameworks to promote biodiversity conservation and related activities (this is on the basis that there are more than adequate laws for conservation of BDC, but there is low capacity for enforcement).*	2	3	3	5	22	12
Capacity to develop and introduce measures and mechanisms for conservation and use of traditional knowledge and equitable sharing of benefits with the knowledge holders.*	2	2	4	5	22	12
Capacity to access relevant financial support systems (through budgetary provisions and external funds) and to design and implement relevant incentive systems and valuation.*	2	2	4	5	22	12
Capacity for identification and monitoring of critically important components of biodiversity.**	1	2	5	5	12	15
Capacity to identify, develop and institute a robust biosafety framework in the country that is consistent with the principles and stipulations of the Cartagena Protocol.**	1	2	4	5	11	16
Capacity to design, develop and implement effective <i>in-situ</i> management and development of Protected Areas in accordance with the ecosystem approach.	1	3	3	3	9	17
Capacity to design and carry out biodiversity related research with potential to support management and development.	1	2	2	5	9	17

D (Disability); U (Urgency for capacity building due to inadequacy); NR (National relevance as opposed to local or regional relevance)

All the above capacity needs which had a [B] x Σ[C] score of > 10 have been analysed to identify specific capacity needs at systemic, institutional and individual levels.

** considered very important to build but capacity has already been built considerably through previous initiatives or a capacity needs assessment has been done through the (e.g. Biosafety Framework Project) and the needs are expected to be addressed through phase II of the project.

Annex 3.1 Persons consulted and institutional visits

Institutions visited:

Forest Department (FD), Department of Wildlife Conservation (DWLC), Coast Conservation Department (CCD), Marine Pollution Prevention Authority (MPPA), National Zoological Gardens (NZG), The National Botanic Gardens (NBG), Central Environmental Authority (CEA), Department of Animal Production & Health (DAPH), Veterinary Research Institute (VRI), Department of Agriculture (DOA), Horticultural Research and Development Institute (HORDI), Seed Certification and Plant Protection Centre (SCPPC), Plant Genetic Resources Centre (PGRC), National Science Foundation (NSF), University of Peradeniya, Botany Department, Open University Environmental Division, Agbiotech Centre, Peradeniya, Biodiversity Division of the Ministry of Environment.

Donor funded project offices visited

Forest Resources Management Project (FRMP), Coastal Resources Management Project (CRMP), Protected Area Management and Wildlife Conservation Project (PAM&WC), Sri Lanka Australia Natural Resource Management Project (SLANRMP).

Media personnel

Ms Irangani Serasinghe, Rupavahini Corporation: Mr S.A.M Samarakoon, Mr. H.R.K Nilanga, Mr I.T Karunatilaka, Mr Kanchana Marasinghe, Mr Gamini Pushpakumara, Mr Waruna Lelwala, Mr Gamini Jayantha Abeywickrama, Mr J.A.D Janaka Sujeewa, Ms Sita Jayasena.

Independent Television Network (ITN): Mr Hasantha Hettiarachichi

Niroshani Liyanage (Executive Coordinator, Sri Lanka Environmental Journalists Forum), Ruchira Gunathilake (Vidurava)

NGOs contacted:

Environmental Foundation Limited (EFL); Wildlife and Nature Protection Society (WLNPS), Green Movement; Organization for Resource Development & Environment (ORDE), Public Interest Law Foundation (PILF).

Discussions with CEA regional and head office staff (mid-career professionals) via the OU.

Deepika Boteju, DEO, CEA Head Office; Mr Pirapahan, Senior Environmental Officer, CEA Head Office, Mr WAAI Wijayarathna, Programme Assistant MOE/BDS; Mr MMAI Janaka, Senior Environmental Officer, Kandy Regional Office; Mr A P Wasalage, Senior Environmental Officer, Anuradhapura Regional Office; Mr TSC Peiris, Senior Environmental Officer, EIA Division, CEA Head Office; Mr R B Ratnayake, Senior Environment Officer, Trincomalee Regional Office; Mr ADLK Karunarathne, Assistant Director, Natural Resources Management and Monitoring Unit Wetland Management Unit; Mr HLK Priyantha, Assistant Director, Weerawila Office; Mr Vijitha Sathyakumar, Acting Assistant Director, CEA Regional Office Badulla; Dr DMTK Dissanayake, Senior Environmental Officer Natural Resources Management and Monitoring Unit, CEA Head Office; Mr YKMCB Seneviratne, Senior Environment Officer, Natural Resources Management and Monitoring Unit, CEA Head Office.

Interviews:

Mr Dayananda Kariyawasam (Director General, Department of Wildlife Conservation), Mr Wasantha Dissanayake (Ecologist, DWLC), Mr Sarath Fernando (Conservator General of Forests, Forest Department), Mr Anura Sathurusinghe (Conservator of Forests), Ms Padma Abeykoon (Assistant Conservator of Forests), Mr Anura Silva (Deputy Conservator of Forests), Dr R.A.D.B. Samaranayake (Director, Coast Conservation Department), Dr. C. Kudagamage (Director General, Department of Agriculture), Dr J. de Soysa (Director, HORDI) and staff; Dr Kumudu Fernando (Director Seed Certification and Plant Protection Service) and Quarantine Staff, Dr H Muthukudaarachichi (Deputy Director and Head, PGRC), Dr SKR Amerasinghe (Director General, DAPH), Dr Ranjith Wickremasinghe (Director VRI), Dr S. Wijesundara (Director and Head, National Botanic Gardens), Brig. HANT Perera (Director, National Zoological Gardens), Ms Renuka Bandaranayake (Deputy Director, National Zoological Gardens), Mr Ajit Rodrigo (Deputy Director, Research & Special Projects, Central Environmental Authority), Mr Gamini Gamage (Director, Biodiversity Division, MOE), Ms Amali Ranasinghe (Research Associate, Agricultural Biotechnology Centre, University of Peradeniya), Ms. Renuka Subasinghe (Research Officer, Agricultural Biotechnology Centre Faculty of Agriculture), Prof. Nimal Gunatilleke (University of Peradeniya, Botany Department), Mr H G Gunawardena (PAM&WC Project), Mr HM Bandaratilleke (FRMP), Steve Hunt (Team Leader,

SLANRMP), Mr Simon Tiller (International Team Leader, CRMP/IS component), Mr Indra Ranasinghe (CRMP), Mr A S K Wickremasinghe (District Fisheries Inspector/CRMP).

Roundtable meeting to discuss capacity development in Sri Lanka for biotechnology using indigenous genetic resources.

Ms Amali Ranasinghe (Research Associate, AgBiotech Centre, University of Peradeniya), Prof. Athula Perera (Senior Professor, Faculty of Agriculture, University of Peradeniya), Mr. Dilip de Silva (CEO, Serandib Horticulture Technologies), Dr D H Muthukuda Arachchi, (Deputy Director, Plant Genetic Research Centre), Dr G A U Jayasekara (Senior Lecturer, Faculty of Science, Department of Botany, University of Colombo), Mr H K Sunil (Research Officer, Sugarcane Research Institute), Ms I Wijayarathnum (Director, Biotechnology, Serandib Horticulture Technologies), Dr Kumudu Fernando (Director, Seed Certification & Plant Protection Centre), Dr M C N Jayasooriya (Director, National Science Foundation), Ms M T K Gunasekara, (Head, Plant Breeding Division, Tea Research Institute), Mr R Wickramasinghe, (Director, Veterinary Research Institute), Dr S Premakumara (Research Officer, Industrial Technology Institute), Dr Vindya Amarasinghe (Biotechnology Consultant, Department of Energy, USA), Mr W D L Gunaratne (Director, Department of Export Agriculture).

Three meetings to discuss Legal Aspects of Access to Genetic Resources and Benefit Sharing

Mr Jagath Gunawardana (Environmental Lawyer), Ms Shalini Ratwatte, (Senior Legal Officer, Environmental Foundation Ltd.), Ms Ruwana Rajapaksha (Citizens Group), Mr Govinda Jayasinghe (Attorney -at Law), Seneka de Saram (Attorney -at Law), Ms. Geethani Wijesinghe (Attorney at law), Dr. J. Dela (Consultant for Biodiversity/NCSA Project), Mr M Watson (project Manager, NSCA project).

Roundtable meeting on Involvement of the Private Sector in Implementing the Convention on Biological Diversity

Dr. F Sultanbawa (Director (R & D), CIC Fertilizers (Pvt) Ltd.), Mr. Sarath Wickramathanthrige (Senior Manager International Marketing, Hettigoda Industries (Pvt) Ltd), Mr. Michael Elias (Director, Walkers Tours), Major Douglas L Wijesinha, (Chairman Grip Furniture (Pte) Ltd), Mr. Rohan Wijesinha (Manager HRM, Janashakthi Insurance), Mr. Vasantha Ranasinghe (Manager EHS, Ceylon Tobacco Company Ltd), Mr. Ravi de Silva (Consultant, Social & Environment Management, Aitken Spence Hotel Managements Pvt. Ltd.), Mr. Vibhu Perera (Director, Lumbini Aquaria Wayamba Ltd), Dr. A H M Jayasuriya (Consultant, Agriculture & Natural Resources, Environment and Management Lanka (Pvt) Ltd), Prof. Athula Perera, (Faculty of Agriculture, University of Peradeniya), Mr Jagath Gunawardana (Environmental Lawyer), Dr. J. Dela (Consultant for Biodiversity/NCSA Project), Mr M Watson (Project Manager, NCSA).

Workshop on Capacity Building Needs to Ensuring Benefits from Providing Access to Genetic Resources

Mr Dayananda Kariyawasm,(Director, DWLC), Dr. A.H.M. Jayasuriya (Team Leader , Task force on Access to Genetic Resources for the BCAP Addendum, Mr. Gamini Gamage (Director, Biodiversity Division, MOE), Ms. Darshani Perera (EMO, Biodiversity Unit, Ministry of Environment), Dr. Anura Wijesekara (Project Coordinator/CWR Project, Horticultural Research & Development Institute), Sarath Ekanayake (IUCN, Sri Lanka Country Office), Dr. Kumudu Fernando (Director, Seed Certification and Plant Protection Center), Mr A Wettasinghe (Officer in Charge, Plant Quarantine Service), Mr K K Perera (Officer in Charge, Plant Quarantine Service), Mr Samantha Gunasekera (Director, Biodiversity Unit, Sri Lanka Customs), Mr. Chathiya Ratnayake (Customs House), P. Wijenayake (Custom Department), Mr. Melwyn Herath (Committee Member, Wild Life and Nature Protection Center), Mr. Douglas Ranasinghe, (Vice President, Wild Life and Nature Protection Society), Ms. Anusha Amarasinghe (Director, Scientific Affairs, National Science Foundation), Ms. Shalini Ratwatte (Senior Legal Officer Environmental Foundation Ltd), Ms. Ruwana Rajapaksha (Attorney at law), Mr. Senaka de Saram (Attorney at law), Mr. Govinda Jayasinghe (Attorney at law), Ms Chamali Wickramaratne (Law & Society Trust), Ms. Iroja Caldera (Attorney at law), Ms. Geethani Wijesinghe (Attorney at law), Mr. Jagath Gunawardana (Attorney at law), Mrs. Lumbini Kiriella (Legal Officer, Ministry of Environment), Ms. S.A.V. Moorthy (Senior Scientific Officer, National Science Foundation), Ms. Kamini Vitharana (Rukrekaganno, Professional Center), Prof. A.L.T. Perera (Senior Professor of Agricultural Biology, Department of Agriculture Biology, Faculty of Agriculture, University of Peradeniya), Ms. Renuka Subasinghe (Research Officer, Agricultural Biotechnology Centre Faculty of Agriculture, University of Peradeniya), Ms. Amali Ranasinghe (Research Officer, Agricultural Biotechnology Centre, Faculty of Agriculture, University of Peradeniya), Prof. Kalyani Perera (Professor of Animal Science Department of Animal Science,

Faculty of Agriculture University of Peradeniya), Dr. Lalith Perera (Department of Genetics and Plant Breeding, Coconut Research Institute), Prof. Sirimalee Fernando (Chairperson/National Science Foundation), Dr S Premakumara (Research Officer, Industrial Training Institute), Ms. Radika Samarasekera (Research Officer, Industrial Training Institute), Dr. Siril Wijesundara (Director, Royal Botanical Garden), Mr Asoka de Silva, Dr Mrs H M RK Ekanayake (Deputy Director, National Plant Quarantine Unit), Dr. Pradeepa Silva (Senior Lecturer, Department of Animal Science, Faculty of Agriculture University of Peradeniya), Mr W D L Gunaratne (Director, Department of Export Agriculture), Dr D H Muthukuda Arachchi (Head, Plant Genetic Research Centre), Dr J de Soysa (Director, Horticultural Crops Research and Development Institute), Dr SKR Amarasekera (Director General, Dept of Animal Production and Health), Ms. Gothami Indikadahena (Deputy Director, Department of Commerce), Mr. Anura Jayathilaka (National Project Director, NCSA project), Mr. Cyril Pallegedera (Add. Secretary, Ministry of Environment), Mr S Wickremeasinghe (Ministry of Environment) Dr. J. Dela (Consultant for Biodiversity/NCSA Project), Mr. M. Watson (National Project Manager, NCSA Project Office, Ministry of Environment & Natural Resources), Mr. T.H. Karunatileka (Capacity Development Expert, NCSA Project).

Workshop on Information Management and Exchange to promote Biodiversity Conservation

Dr. Mayuri Wijesinghe (Department of Zoology, Faculty of Science, University of Colombo), Dr. A. Wijesekera (Horticultural Research & Development Institute), Mr. Douglas Ranasinghe (Wildlife and Nature Protection Society), Ms. A. Amarasinghe, (Director, Scientific Affairs, National Science Foundation), Ms. A. Pitadeniya (Scientific Officer, National Science Foundation), Ms Sunethra Perera, (Head Information Division, NSF), Ms. Nanda Perera (Director Information, National Science Foundation), Mr. Jagath Gunawardena (Attorney at Law), Dr. R.M.C.S. Ratnayake (Senior Lecturer, Department of Plant Science, Faculty of Science, University of Colombo), Ms. P.M. Jayasinghe (Industrial Technology Institute), Ms. Thashara Abeysekera (Industrial Technology Institute), Ms. Mihiri Gunawardena (PILF), Mr. Niroshani Liyanagae (SLEJF), Mr. Nimal Rajarathna (Coastal Conservation Department), Ms. I. Peiris (Librarian, CARP), Ms. S. Disanayake (Plant Genetic Resource Center), Mr. Kapila Perera (National Science and Technology Commission), Mr. S.A.N.S. Subasinghe (Central Environmental Authority), Dr. U.K.G. Padmalal (Senior Lecturer, Department of Botany, Open University), Dr. Vindya Amarasinghe (Biotechnology Consultant, Department of Energy, USA), Ms. A.C.P. Dabare (Librarian, Central Environmental Authority), Ms. A. Jayaweera (Librarian, Environmental Foundation Ltd), Ms. N.S.A. Edirisinghe (Librarian, National Library), Ms. Chandrasekera (Librarian, University of Colombo), Ms. I. Mudannayake (Librarian, Post Graduate Institute of Agriculture, University of Peradeniya), Ms. H.P.S.S. Gunasekera (Senior Assistant Librarian, Open University), Ms. Chandima Gunadasa (Librarian, IWMI), Ms. S.C.D. Fernando (EDB), Ms. D. Talagala (Librarian, American Center), Mr. B. Dayananda (Librarian, IUCN), Mr. M. Watson (National Project Manager, NCSA Project), Dr. D. Dela (Thematic Consultant Biodiversity, NCSA Project), Mr. T.H. Karunathilaka (Capacity Development Expert, NCSA Project).

Roundtable Meeting on “Setting the Stage through *In-situ* and *Ex-situ* Conservation for adopting the Ecosystem Approach”

Mr Leslie Wijesinghe (Chairman, National MAB Committee), Mr. W.M. Jayatilleke (Additional Secretary/Lands Ministry of Agriculture, Irrigation & Mahaweli Department), Mr Gamini Gamage (Director, Biodiversity Secretariat, Ministry of Environment), Ms. Champika Kariyawasam (EMO, Biodiversity Secretariat, Ministry of Environment), Mr Dayananda Kariyawasam (Director General, Department of Wildlife Conservation), Mr Sarath Fernando (Conservator General of Forests, Forest Department), Mr. G. Piyasena,, (Director General, Department of Fisheries & Aquatic Resources), Dr R.A.D.B. Samaranayake (Director, Coast Conservation Department), Brigadier H.A.N.T. Perera (Director, National Zoological Gardens), Dr. C. Kudagamage (Director General, Department of Agriculture), Dr S. Wijesundara (Director, National Botanical Gardens), Mr. Abayananda Dias (Director, Plantation Management & Monitoring Division, Ministry of Plantation Industry), Mr. S.A. Jayaratne (Chairman, Land Reform Commission), Mr Gamini Jayasinghe (Director, Head Environmental Division, Central Environmental Authority), Mr Ajit Rodrigo (Deputy Director, Research & Special Projects, Central Environmental Authority), Dr. Sepalika Jayamanne (Head - IRAD, National Aquatic Resources Research & Development Agency), Mr. Anura Sathurusinghe (Conservator of Forest, Forest Department), Ms. Anusha Amarasinghe (Director, Scientific Affairs, National Science Foundation), Dr U.K.G. Padmalal (Head, Environmental Division, Open University of Sri Lanka), Dr A.H.M. Jayasuriya (Environment Management Lanka (Pvt) Ltd), Dr Channa Bambaradeniya (IUCN, Regional Office), Ms. Mihiri Gunawardena (Public Interest Law Foundation, SLAAS), Mr. B.R. Gunaratne (The Green Movement), Ms. Asha Pitadeniya, (Scientific Officer,

National Science Foundation), Ms. Lakmini Fenando (Scientific Officer, National Science Foundation), Mr. M. Watson (National Project Manager, NCSA Project), Dr. D. Dela (Thematic Consultant Biodiversity, NCSA Project), Mr Jagath Gunawardana (Environmental Lawyer).

Roundtable Meeting on Obtaining Cross-sectoral Support for Biodiversity Conservation: Adopting the Ecosystem Approach

Mr L.C.A. de S. Wijesinghe (Chairman, National MAB Committee), Mr. W.R.M.S. Wickramasinghe (Additional Secretary, Ministry of Environment), Mr. Mervyn Gunasena (Director General, Central Environmental Authority), Mr. Dayananda Kariyawasam (Director General, Department of Wildlife Conservation), Mr Gamini Gamage (Director, Biodiversity Division, Ministry of Environment & Natural Resources), (Public Interest Law Foundation SLAAS), Mr. T. Sooriyagoda (Director, Development, Sri Lanka Tourist Board), Mr. B.K. Jayasundera (Department of Irrigation), Mr. M.M.S.R. Perera (Addl. Director, Environment, Mahaweli Authority of Sri Lanka), Mr. D.M.A.K. Dhanasekera (National Gem & Jewellery Authority), Mr. S. Senanayake (Assistant Secretary, Ministry of Tourism), Mr. Azath Salley (Deputy Mayor, Colombo Municipality Council), Mr. Prema Cooray (Ceylon Chamber of Commerce), Mr. Stanly Jayawardena (National Chamber of Commerce of Sri Lanka), Major Douglas L Wijesinha (Governor, Rotary Club, Colombo West), Ms Shalini Ratwatte (Senior Legal Officer, Environmental Foundation), Mr. Gihan de Silva Wijerathne (Sri Lanka Tourist Hotels Association), Mr R.A.D.P. Premaratne (Asst. Manager, Public Enterprises Reform Commission of Sri Lanka (PERC), Mr. Anura Sathurusinghe (Deputy Conservator of Forests, Forest Department), Mr. T.H. Karunathilake (Capacity Development Expert, NCSA project), Mr. S.A. Jayarathne (Land Reform Commission), Mr. Asitha Senevirathne (Ministry of Industrial Development and Investment Promotion), Mr. Sudarshana Perera (Deputy Director, Department of National Planning), Mr. B.A. Jayananda (Ministry of Agriculture, Irrigation & Mahaweli Development), Mr. P. Wijenayake (Sri Lanka Customs, Biodiversity Division, Custom House), Ms. Punya Senevirathne (Deputy Legal Draftsman, Legal Draftsman's Department), Prof. S. T. Hettige (Department of Sociology, Faculty of Arts, University of Colombo), Mr. Douglas Ramanayake (Ministry of Education), Mr. S. Ranugge (Secretary, Ministry of Science and Technology), Ms. Anouk Ilangakoon (marine biodiversity consultant), Mr. B.H.I. Premathilake (Coast Conservation Department), Ms. Sagarika Bogahawatta (Ministry of Plan Implementation), Ms. M.A.S. Perera (Board of Investment Sri Lanka), Mr. D.R. Gunaratne (GMSL), Mr. S.K. Shanka (Deputy Inspector General of Police), Mr. J. Keenawinna (Police Headquarters), Ms. P. Nalika Ranasinghe (Geological Survey and Mines Bureau), Mr. Michal Kalleye (IUCN-Regional Office), Mr. Aseem Srivastava (IUCN-Regional Office), Mr. Samantha Jayasinghe (Deputy Director, Ministry of Foreign Affairs), Ms. Anusha Amarasinghe (Director, Scientific Affairs, National Science Foundation), Mr. M. Watson (National Project Manager, NCSA Project), Dr. J. Dela (Thematic Consultant Biodiversity, NCSA Project), Mr Jagath Gunawardana (Environmental Lawyer).

Communication planning training and needs assessment workshops

Workshop 1:

Ms. Shalini Ratwatte (Environmental Foundation Ltd), Ms. Lakmini Fernando (National Science Foundation), Lakshi Wickramadara (National Science Foundation), Mr. Sagara Chandrakumara (NCSA Project), Ms. Vindya Hewawasam (NCSA Project/MOE), Ms. Maduri Peiris (NCSA Project/MOE), Ms. U.D.G.S. Uggalla (NCSA Project/MOE), Mr. L.H. Aourasha (NCSA Project/MOE), Ms. W.P. Surani Devika (Environmental and Global Affairs Division/MOE), Dr. J. Dela (Thematic Consultant, Biodiversity, NCSA Project/resource person), Ms. P. Rope (Assistant), Ms. Sachithra Jayawardena (NZG), Ms. Geethani Wijesinghe (Environmental Foundation Ltd)

Workshop 2: Staff at Environmental Foundation Ltd (held on request)

Field visits for community level discussions to sites organised by the FD:

Sri Lanka Australia Natural Resource Management Project (SLANRMP) community at Galgamuwa.

Workshop on Enhancing Support for Biodiversity Conservation at Regional and Local Levels:

Dalupothagama-Galgamuwa: Ms. Manjula Amararatna (Department of Wildlife Conservation, Anuradapura), Mr. Nishantha Edirisinghe (DFO, Forest Department, Kurunegala), Mr. A.H.M.R. Abeyaratne (Organization for Resource Development and Environment - ORDE), Mr. A.S.L.E. Corea (RO/IARAD, NARA), Mr. M.H.S. Ariyaratne, (Head/IARAD, NARA), Mr. D.R. Gunaratne (Green Movement of Sri Lanka, Nugegoda), Mr. A.M.D. Wedande (SLANRMP, Boyagane), Mr. A.D.R. Amarakoon (SLANRMP, Boyagane), Mr. M.M.M. Pahalage (Elephant Control Unit, Galgamuwa), Mr. D.G. Gamini Bandara (Wild Life Office, Meegawewa), Mr. P.M.K.U.K. Herath (Range Forest Office, Galgamuwa), Mr. A.N.K. Sumanawansa (AD, Kurunegala), Mr. Sujeewa L. Kudaligama (I.D.B. Kurunegala), Mr. M.S.

Ratnayake (I.D.B. Kurunegala), Mr. Jagath Gunawardena (Attorney at Law), Ms. Kumudu Nawalagae (ADA, Nature Ref. Mgt. Center), Mr. W.A.K. Karunathilaka (R.O./NRMC, Peradeniya), Mr. R.M.S. Ratnayake (R.F.D. Galgamuwa), Mr. K.M. Wasantha Jayathilake (F.E.O., Galgamuwa Range), Mr. A.H. Bandula Nawaratne (G.S. Mudiyanneagama), Mr. A.H. Lensuwa (Dalupothagama), Ms. H.M. Anulawathi (Dalupothagama, Gonnagama, Makulewa), Ms. D.M. Kusuma Dissanayake (Dalupothagama, Makulewa), Ms. H.M. Priyanka Kumari Dissanayake (Milagaswewa, Makulewa), Ms. I.M.S. Lakmali (Milagaswewa, Makulewa), Ms. P.G. Heenmanikae (Dalupothagama), Ms. E.M. Champika Priyadarshani (Dalupothagama), Ms. T.M. Chandralatha (Dalupothagama), Ms. P.A. Gunaratne Manikae (Dalupothagama), Ms. H.M. Sunethra Kumari (Dalupothagama), Ms. I.M. Herath Manikae (Dalupothagama), Ms. J.M. Nanda Jayakodi (Dalupothagama), Mr. Nishanka Sumith Kumara (Dalupothagama), Ms. I.M. Mallika Kumari (Dalupothagama), Ms. E.M. Nishanthi Ekanayake (Dalupothagama), Mr. H.M. Upali Herath (Dalupothagama), Mr. A.H. Singappuliya (Dalupothagama), Mr. H.M. De Ranbanda (Milagaswewa), Mr. H.M. Ranhami (Milagaswewa), Ms. H.M. Niluka (Dalupothagama), Mr. H.W. Saman (Dalupothagama), Ms. R.M. Sittamma (Dalupothagama), Ms. H.M. Kumuduni Sandya (Milagaswewa), Ms. H.M. Renuka Kumari (Milagaswewa), Mr. Anura Sathurusinghe (Conservator of Forests, Forest Department), Dr. J. Dela (Thematic Consultant-Biodiversity, NCSA Project), Ms. H.A.U. Amarasinghe (Director Scientific Affairs, National Science Foundation), Mr. Percy Ranasinghe (NCSA Project), Ms. Vindya Hewawasam (NCSA Project), Ms. Maduri Peiris (NCSA Project), Ms. U.D.G.S. Uggalla (NCSA Project), Mr. L.H. Aourasha (NCSA Project)

South West Rainforest Conservation Project site at Hiniduma North (bordering Kanneliya)

Mr K H Karunasheela, traditional Medicine Practitioner, Mr KHM Jayaratne, DFO Galle, Mr Dulip Gunaratne, Addl. Range Forest Officer, Tawalama, RFO Kanneliya and Field Assistant, and Environmental Officer, Mr Chitrasena and Ms Padma Abeykoon (Assistant Conservator of Forests).

Institutions contacted through the questionnaire survey:

Ministry of Environment, Ministry of Agriculture, Lands, Livestock & Irrigation, Ministry dealing with fisheries and aquatic resources, Ministry dealing with plantation industries, Ministry dealing with indigenous medicine, Ministry dealing with provincial administration, Ministry dealing with Tourism, Ministry of Foreign Affairs, Ministry dealing with trade, Ministry of Science & Technology, Ministry dealing with power & energy, Ministries dealing with education, Ministry dealing with Finance and Planning, Ministry and institutions dealing with urban development water supply, Ministry dealing with health, Ministry dealing with road transportation, Forest Department (FD), Department of Wildlife Conservation (DWLC), Urban Development Authority (UDA), Environmental Authority (CEA), Mahaweli Authority of Sri Lanka (MASL), Coast Conservation Department (CCD), Dept of Fisheries & Aquatic Resources (DFAR), National Aquatic Resources Research and Development Agency, NARA, Marine Pollution Prevention Authority (MPPA), Dept of Export Agriculture (DEA), Dept of Animal Production & Health (DAPH), Department of Agriculture, Field Crop Resources Development Institute (FCRDI), Horticulture Research and Development Institute (HORDI), Rice Research and Development Institute (RRDI), National Plant Quarantine Services, Seed Certification and Plant Protection Centre, Plant Genetic Resources Centre (PGRC), National Zoological Gardens, Dept of National Museums, Department of Ayurveda, Tea Small Holdings Development Authority, Coconut Cultivation Board, Council for Agricultural Research Policy (CARP), National Science Foundation (NSF), Bandaranaike Memorial Ayurvedic Research Institute (BMARI), Industrial Technology Institute (ITI), NASTEC - National Science and Technology Organization, University of Colombo, University of Peradeniya, University of Sri Jayawardenapura, University of Kelaniya, Ruhuna, Jaffna, Moratuwa, Open University, Eastern, Coconut Research Institute (CRI), Tea Research Institute (TRI), Rubber Research Institute (RRI), Sugarcane Research Institute (SRI), Veterinary Research Institute (VRI), Dept of Censuses & Statistics, Provincial Councils - Wayamba, Central Province, Southern Province, District/Divisional Secretariats - Panadura, Kandy, Local Authorities - Panadura, CMC Colombo, Ratnapura, Department of National Planning, Sri Lanka Standards Institute (SLSI), Ceylon Tourist Board, Sri Lanka Customs, Attorney General's Department, Legal Draftsman's Department, Police Department, Registrar of Patents and Trademarks, Geological Survey and Mines Bureau (GSMB), Meteorological Department, Sri Lanka Land Reclamation Development Board, Land Reform Commission (LRC), Department of Small Industries, State Timber Cooperation (STC), National Institute of Education, Environmental Foundation Limited (EFL), Green Movement, Sri Lanka Nature Forum, Organization for resource development & Environment (ORDE), Public Interest Law Foundation (PILF), IUCN - The World Conservation Union, Sri Lanka office, Environmental Journalists' Forum, Wildlife and Nature Protection Society, Media institutions, Ceylon Chamber of Commerce, National Chamber of Commerce, PAM&WC Project, FRMP, CRMP

Chapter 4

The Institutional Assessment - Results of NCSA beneficiary capacity survey

**Main institutions, coordination and decentralization mechanisms, and previous
capacity building initiatives relevant for biodiversity conservation and
sustainable use**

BOX 4.1

Assessing capacity

- What relevant technical capacity exists and is the infrastructure available and sufficient to address the objectives of the respective area?
- What human resources are available, and through which organizations, to work on the respective thematic area?
- What training and human resource programmes exist and what do they offer?

(Source: National Capacity Self-Assessment Project Documentation , 2006)

4.1 The institutional assessment

4.1.1 The Biodiversity Division of the MOE

The ministry dealing with environment established a Biodiversity Unit in 1995 to facilitate the BCAP preparation process and to manage the government's biodiversity conservation initiatives. This was expanded to form the Biodiversity Secretariat within the Ministry's Environmental Division under the Director, Natural Resources. This has now been further expanded to form the Biodiversity Division of the MOE, under the Director, Biodiversity. The Biodiversity Division of the MOE now carries out the activities of the Biodiversity Secretariat. This division is specifically responsible for facilitating and formulating policies and plans for national biodiversity conservation, carrying out specific responsibilities assigned to it in the BCAP and Addendum, ensuring that national obligations under the Convention on Biological Diversity and the Cartagena Protocol (signed in 2000 May 24th and ratified in 2004 April 28th) are met with, and any benefits (training, funding for COP determined activities, etc) under these conventions are received. The Biodiversity Secretariat (i.e. the Biodiversity Division of the MOE) is currently involved with the preparation of an addendum to the BCAP with the guidance of the National Experts' Committee on Biodiversity (NEC) with funds and technical assistance from the ADB/GEF/Netherlands funded Protected Area Management and Wildlife Conservation (PAM &WC) Project.

TABLE 4.1: The Structure and staff strength in the Biodiversity Division of the MOE

Existing Cadre	Required Cadre*
Director: 01 Deputy Director:- 01 --- Environmental Management Officers Grade 1: 03 Environmental Management Officers Grade 2: 04 Programme Assistants (untrained): 11	Director: 01 (heading the Division) * Deputy Directors: 02* Assistant Directors: 04 Environmental Management Officers (Grade I): 03 Environmental Management Officers (Grade II): 06

* Approved cadre positions of senior staff at present

Main constraints/capacity needs:

Systemic	There is poor conceptualisation of what capacities are required to implement the BCAP in the BDS. As clearly stated in the BCAP of 1999 and report of Task Force 11 for preparation of the addendum to the BCAP, the BDS has to facilitate the implementation of the BCAP (i.e. in a similar manner in which the MOE has to implement the NEAP). However, a large number of institutions have to actually implement the individual recommendations. This process has to be coordinated, monitored and helped by the BDS through a strategically planned mechanism. This appears too ambitious a task for the CEPOM on forestry and wildlife, or the CEPOM on coastal and marine systems, as biodiversity concerns in sectors such as agriculture, fisheries, coastal and marine also need to be addressed holistically. Furthermore, the objectives of the CEPOMs are to ensure implementation of the NEAP. There is currently a shortage of funds for representing Sri Lanka at CBD/COP meetings, as the country is no longer eligible for financial assistance for participation. <i>This is a serious drawback to meeting the obligations of the CBD.</i> It is further discussed in chapter 5.
Institutional	Facilitating the implementation of the BCAP and Addendum by the BDS requires detailed co-ordination mechanisms and monitoring systems which are lacking. The BDS has been called upon to prepare a strategic implementation plan for the BCAP in the addendum to the BCAP (TF 11). CBD COP decisions are circulated only to the National Experts' Committee on Biodiversity (NEC), due to capacity constraints (in terms of human resources and funds) in the BDS. <i>This is a major constraint to meeting the obligations of the CBD and for benefit sharing.</i> Capacity is needed to disseminate the outcomes of the COP meetings (i.e. country responsibilities and actions, training initiatives, funding opportunities, etc.) to a wider stakeholder group. The BDS has low capacity at present to establish an ABS regime, effective communication, education and public awareness; facilitating the clearing house mechanism; and establishing a meta-database on biodiversity or carry out the vital functions of co-ordination, monitoring and evaluation to implement the BCAP. <i>This requires considerable capacity strengthening within the BDS.</i>
Individual	There is no scheme to recruit Assistant Directors. As such, the Director and Deputy Director have to attend to all matters requiring technical expertise. This is cited by senior staff as a serious constraint to meeting the full range of actions required of the BDS. This deficiency is expected to be partly rectified by the promotion of EMOs (Grade 1) in the Division to Deputy Director and Assistant Director grades. While the staff in the BDS are sufficient in numbers (Table 4.1), most are junior staff with limited experience to comply with the complex and varied tasks of the BDS. Absence of a proper promotional scheme is demotivating for junior staff. This is, however, expected to be rectified shortly by the new promotional scheme.

● Decentralisation

The MOE has no structures for decentralization, except for some district and provincial level committees in which there is representation by the Ministry. However, Provincial Ministries of Environment could play an important role in biodiversity matters at the regional/local levels. Although preparation of regional biodiversity plans has been recommended in the Addendum the BCAP, capacity is low at the regional level to contribute meaningfully to such an exercise.

4.1.2 The Forest Department (FD)

The structure and functions of the FD are given in detail in the baseline report. This department is currently engaged in the conservation and management of considerable land under natural forest, including much of the biodiversity rich wet zone forests which are managed for protection. The forest management practice in natural forests during the few past decades has veered towards conservation. However, there is acceptance among the head office and field staff that complete restriction of the use of forest resources by local people is counter-productive to achieving forest biodiversity conservation, with the exception of biologically sensitive areas that require strict protection. Community participation for forest conservation (and in the case of dry zone forests, community management) is accepted within the department, and staff capacity building to promote this concept is in progress.

● Structure

The FD comprises a head office in Colombo and four regional offices through which its activities are decentralised. The department handles (a) research, education and training, (b) operations, and (c) administration. The divisions of the FD address environmental management, planning and monitoring, forest conservation, production and management (silviculture comes under production), social forestry and extension, and protection and law enforcement. The FD has a remote sensing (GIS) unit and an environmental database which has recently been revamped and made user-friendly. The research activities of the department include the work done at the Kumbalpola Research Station (*relevant for Article 12(b)*). The Sri Lanka Forestry Institute (SLFI) of the FD has good training facilities (*relevant for Article 12(a)*).

Under the recent restructuring of the FD, the community management activities of the Environmental Management Division (EMD) at the head office have been handed over to the FD's Social forestry and Extension Division. However, a follow-up study of the restructuring by the FRMP has recommended reintroduction of the EMD. This is supported by the FD staff.

● Training facilities

The Sri Lanka Forestry Institute (SLFI) at Moon Plains, Nuwara Eliya, offers residential courses for FD's Range Forest Officers (RFOs) and Assistant Regional Managers of the State Timber Corporation (STC); a one year full time Forestry Certificate Course; and short term training courses in many aspects of forestry, and subject specific training for forestry personnel in technical and sub-technical grades (*relevant for Article 12(a)*). Training on participatory forest management is inbuilt into the FD training curricula. A special short course in forest survey is carried out at the Sri Lanka Forestry Institute for DWLC staff. Tailor made courses are also offered to other institutions on request (*relevant for Article 12(a)*). This facility can be made available to other departments such as the police. In-service postgraduate training overseas is also provided for Assistant Conservators of Forests (ACF) level. There is an ongoing field based training of trainers programme (5 modules spanning 1.5 years) on social mobilisation and participatory resource management through a special AUSAID funded project (*relevant for Article 8(e,f,i,j,l)*). This training can be extended to other state departments and NGOs.

Main constraints/capacity needs/strengths:

Systemic	Funds allocated annually for biodiversity conservation by the Treasury is insufficient. This brings about considerable dependency on external project funds. The coordination mechanisms for joint action with sectoral institutions are not adequately effective.
Institutional	There is inbuilt professionalism in the FD for forest management due to long-term investments in staff training. Only graduates are recruited as Assistant Conservator of Forests. They are further provided with postgraduate training - which is a requirement for career advancement - mostly at an overseas institution. All medium and lower level field professionals (RFOs and BFOs) are trained at the Sri Lanka Forestry Institute via a two year professional

	training diploma for RFOs and a one year certificate course for BFOs. The training for RFOs and BFOs is provided after recruitment. <u>This training is mandatory for all field officers to obtain their promotions and, sometimes even to obtain departmental transfers.</u> Hence motivation for training is high in the FD at all levels. The required qualifications are thus inbuilt into the promotional and transfer schemes. There appear to be no major institutional barriers to communication within and across relevant divisions of the FD in general. However, sharing of training, identification of threats to forest biodiversity, and data sharing with other institutions for policy formulation (e.g. with DWLC, CCD, DOA, NBSG) should be enhanced. Past capacity development efforts appear sufficiently linked to existing or future legal and regulatory responsibilities and institutional requirements.
Individual	Senior officers (from Assistant Conservator level) are clear about promotional prospects through the existing promotional scheme. The possibility of rising to the top administrative levels through the department is a plus point for staff motivation. This is also made possible by the presence of adequately qualified and trained staff within the institution. Staff motivation was very good among the limited but varied sample of staff (senior to minor field staff) contacted during this project. Most field staff and senior management staff are males, but this is not because of gender discrimination. Individuals have incentives to acquire new skills and technical capacity as this is tied up with career advancement. They are also provided with sufficient opportunity to do so. However, training more staff in social mobilisation and participatory management is required to make this approach more widely operational within the FD. Similarly, more skills are required for strategic planning of communication, education and public awareness; setting up interpretative facilities such as visitor centres; management planning; field monitoring and reporting threats to biodiversity; and specific measures for faunal conservation in forest reserves. Individuals appear to be in contact and to exchange knowledge and experiences with appropriate peers within the FD. Individuals are satisfied about being consulted on major capacity building initiatives and they have a say in finalising these project proposals. Consequently, activities of donor funded projects are generally considered a part of institutional work and not as an additional burden. Field staff have legal authority to take action under the Forest Ordinance. However, they do have constraints in implementing the FO. The FD does not have a Legal Officer as yet, and hence depends on the Attorney General's Department for legal advice. This is a constraint. The field guides at the newly established conservation forests require training, uniforms and FD identity cards. As these guides are not on the regular staff of the FD, the lack of authority to curb adverse practices of visitors in when in the field is affecting their motivation. Women in CBOs are also keen to become guides, but only males have been recruited from the nearby villages for the guide service as yet. (this was a request from the Hiniduma North CBO at Kanneliya).

A large number of capacity development projects have been carried out so far (see section 4.2)

Overall capacity building needs:

Field level: (a) implementing community participation for buffer zone management and forest conservation more widely in wet zone forests: this requires more funds and staff training for social mobilisation, etc. (b) establishing and maintaining visitor centres and conducting educational programmes with more participatory hands-on methods rather than the conventional lecture methods which are currently in use; (c) training guides in the new conservation forests [*i.e. guides at Kudawa in Sinharaja Reserve are very well trained and experienced, and could be used as trainers; members of NGOs such as WLNPS are willing to help train guides on faunal identification*], (d) skills training for monitoring and reporting of threats to biodiversity, (e) communication planning for various target groups to promote forest conservation/management, and (f) specific conservation action for threatened faunal species prioritised in the species action plans being prepared.

Regional and central levels: Skills for: (a) management plan preparation, proposal writing, reporting and evaluation of project outcomes, (b) specific conservation action for fauna (*i.e.* staff should be trained in relation to needs identified in the species action plans that are now being prepared, and (c) database management (includes data collation, updating and sharing).

4.1.3 The Department of Wildlife Conservation (DWLC)

The details of structure and functions of the Department of Wildlife Conservation are given in the Baseline report. The mission of the DWLC is “to conserve wildlife and nature by sustainable utilization of men, materials and land through participatory management, research education and law enforcement and ensure the maintenance of biodiversity and forest cover as exists today.”

The DWLC is primarily responsible for the implementation of the Fauna and Flora Protection Ordinance No. 2 of 1937 (FFPO), and its subsequent amendments, but capacity for enforcement of the FFPO is weak. The DWLC manages six categories of wildlife reserves. The DWLC has to request an IEE or EIA for developmental activities in areas within one mile from the boundary of any National Reserve declared under the FFPO, and is a project approving agency under the NEA. It also has to prepare draft amendments to the FFPO.

● Structure

The recent restructuring under the PAM&WC project has identified several branches for the DWLC: finance, administration, research and training, law enforcement, elephant conservation, wildlife health, community outreach, visitor services and ecotourism, planning and ICT and natural resources. The community outreach and ecotourism branches have yet to be made operational. The restructuring will finally result in five DD positions at Regional level to strengthen decentralization. The DWLC does not delegate functions to other institutions at the local level (as they have a strong field presence in the national reserves) but the police are empowered to enforce the FFPO.

● Training facilities

The national training centre for wildlife management at Giritale provides training courses for wildlife rangers, range assistants and guards in the DWLC (*relevant for Article 12(a)*). The regular courses offered by the Centre are the Special Diploma Course of nine months for Wildlife Rangers, the six month Senior Certificate Course for Wildlife Range Assistants, and the two month Junior Certificate Course for Wildlife Guards. A special short training course on forest survey conducted at the Sri Lanka Forestry Institute is among the courses offered. Applied research is promoted among the staff through small research grants made by the DWLC.

● Staff

The DWLC is headed by a Director General. There are two Directors under the DG, and seven Deputy Directors at present at head office. There are two ADs at the head office and seven field based ADs in the regional offices. Recruitment of ADs from the scientific service has started only in the mid 1990s. The Research and training branch has several new graduate recruits, one education

officer and an ecologist to assist the DD. It is understaffed in terms of experienced officers. There are about 700 officers at field level to manage the protected areas under the DWLC. The Wildlife Health and Management Branch also has six veterinary surgeons stationed at field level. The DWLC staff (as well as officers from other institutions) were provided a post graduate training in Wildlife Ecology and Management.

Main constraints/capacity needs/strengths:

Systemic	A more effective coordination mechanism to share resources between the FD and DWLC is desirable, especially for staff training, filming and photography, and database management. <i>[note: A special short training course in forest survey is already conducted for DWLC staff at the Sri Lanka Forestry Institute].</i> Joint training programmes with the FD can strengthen the capacity of the FD for faunal conservation. Likewise the capacity of the DWLC could be strengthened to deal with floral conservation and participatory management.
Institutional	It has been long recognized that the protective functions of the DWLC are hampered by inadequate funds and skilled staff. Funds allocated for biodiversity conservation by the treasury are greatly insufficient. This causes heavy reliance on project funding. There are staff inadequacies in terms of both numbers (at the field level) and skills (at both head quarters and field levels). Investment in staff training and recruitment procedures in the past decades have not created a pool of adequately trained and experienced staff at both the central and field levels to meet the demands of modern protected area and faunal management approaches. Capacity development efforts in the past have not been sufficiently linked to enhancing legal, regulatory, or institutional requirements and responsibilities. Capacity built in the past has also not been sustainable over the medium or long-term. Remedies for the lack of capacity in the DWLC have been sought through investment projects since the early 1990s, but these have not achieved their expected objectives. Some critical capacity needs are being addressed by the currently ongoing PAM&WC project (see the baseline survey report and section 4.2). However, the training component of the PAM&WC project has been slow to get off the ground. More empowerment is required at the decentralized level, as most financial decisions are made at the DWLC Colombo head office. This is expected to be provided through the establishment of Regional Deputy Directors. Research emanating from universities tends to be theoretical and contributes little to enhance wildlife management. The results of research carried out in protected areas are also rarely communicated back to the DWLC. <i>[this requires inclusion of a mandatory clause on research agreements to address this issue].</i> The community outreach division should be strengthened and made operational.

Individual	Recruitment and promotional schemes in the DWLC need revision. Some categories of staff have had no promotional prospects under the present scheme. This is, however, being addressed under the PAM&WC project. Capacity building through skills training and study tours is required at the central, regional and field levels to meet the demands of modern protected area management approaches. Very specific training cannot as yet be provided by the Giritale Training Centre. This could be provided by way of overseas exposure through study tours and twinning/exchange programmes. For example, more intensive training is required for adaptive management, especially for eradication or control of invasive species. Individuals have had little motivation and incentives in the past to acquire new skills and enhance their technical capacity for protected area management. Training opportunities also have not been adequate in the past even for Assistant Directors. (This is also being rectified through the PAM&WC project to some extent). There are some barriers to communication among individuals within the institution and with other institutions. Individuals are not sufficiently in contact and exchanging knowledge and experiences with appropriate peers. The field staff strength (700) is considered inadequate to carry out protective functions. Although the field staff have legal authority to take action under the FFPO, the DWLC lacks a legal officer. Currently the DWLC uses the services of the legal officer at the MOE. This is a constraint.
Main capacity requirements: Skills for management: (a) protected area management approaches, particularly for adaptive management and to move away from a mainly enforcement regime <u>to a more participatory approach when working with local people at field level</u>; (b) implementing community participation for buffer zone management and forest conservation more widely in all protected areas; (c) better law enforcement at field level; (d) establishing and maintaining effective visitor centres and conducting educational programmes; (e) training guides in protected areas - especially as there are many new recruits; (f) preparation of plans, project proposals and reports; evaluation; (g) planning and implementing strategic communication, education and public awareness programmes and consensus building, (h) conservation action for threatened species (identified in the species action plans being prepared by the MOE; and (i) data collation and database management. While some of these needs are addressed under the PAM&WC project, further capacity building is required to enable the DWLC to fulfil its mandate fully.	

4.1.4 The Central Environmental Authority (CEA)

The Central Environmental Authority (CEA) was originally established under the National Environmental Act (NEA) of 1980 as a policy formulation and co-ordinating body for environmental management. Subsequently, it received adequate authority and legal provision under the 1988 revision of the NEA to control environmental pollution and to mitigate the adverse impacts of development activities through legally binding EPL and EIA procedures respectively. The CEA is also empowered with monitoring industrial discharge of effluents into waterways, air emissions and noise pollution.

The CEA is also the regulatory authority for standard setting (e.g. in respect of ambient water standards, ambient air quality standards, mobile source emission standards, industrial emission standards and interim stationery sound emission standards). Under the NEA, the CEA declares environmentally sensitive areas.

The activities of the CEA are decentralised via eight regional offices which have authority to award EPLs, carry out the CEA's monitoring functions, and where relevant EIA procedures of prescribed projects with less complexity and magnitude such as small housing projects, small scale land clearing, etc. The CEA has also Divisional Environmental Offices (DEOs) in the Divisional Secretariat Offices to help address environmental matters at the local levels. These officers are expected to advise the Divisional Secretaries on environmental matters, such as awarding permits for sand mining and awarding of minor permits within the Coastal Zone on behalf of the Coast Conservation Department, and to carry out environmental awareness at the local level. The Wayamba Environmental Authority has been setup under the North Western Provincial Administration. The issue of licenses for 15 types of low polluting industries have, however, been delegated to Local Authorities since 1994. Similarly, checking mobile source emissions is delegated to the traffic police.

The CEA has no formal staff training facilities. A postgraduate diploma conducted by the Open University (OU) for mid level professionals in the CEA Head Quarters, regional offices and DEOs has covered varied aspects of biodiversity conservation and management and environmental policy planning. A short training for mid level professionals at the CEA headquarters and regional officers was provided recently by the OU on the management of environmentally sensitive areas. The CEA has a well equipped auditorium - now used for educational programmes for school children and outside agencies - that can be used for staff training programmes.

Systemic	There is poor inter-sectoral coordination with other agencies such as the DWLC and FD when the CEA declares environmentally sensitive areas under the NEA.
Institutional	There is some concern among the staff whether the CEA is over extending its scope and not concentrating adequately on what it is principally mandated for: facilitating the EIA and EPL process and standard setting. There seems be some confusion about the vision and mission of the CEA among even the senior cadres, although this is clearly spelt out in the NEA and its 1988 revision. Decentralisation - despite its plus points- has also resulted in senior staff moving to the regions, and thereby depleting the staff trained in EPL and EIA procedure at the Colombo office. This is a constraint as much of the industries requiring EPL compliance monitoring are in the Western Province. The trained staff in the regional offices are under-utilised as the laboratory facilities in the regional centres are inadequate to carry out very complicated tests. No mechanism has been set in motion to provide legal authority for CEA staff and to make use of the provisions of the NEA in this regard.
Individual	- There are no job descriptions for mid and junior level staff. - There are few training opportunities for staff on protected area management, although the CEA is now responsible for regulating development in environmental protection areas declared under the NEA. - Although a post graduate diploma course on environmental management, linked to career advancement, was provided via the OU (this also offered a course in biodiversity conservation and management), many DEOs appear to have poor incentives to acquire new skills and technical capacity related to their work (There are several exceptions). - Divisional Secretaries are often not clear about the duties of DEOs. This results in the DEO having to carry out administrative functions for the DS and not the work expected by the CEA. This leads to demotivation among DEOs. - The legal authority of the CEA staff is insufficient at field level to carry out their functions effectively. At present they can only report back to the CEA (or in the case of DEOs they have to report to the Divisional Secretary). This too causes demotivation among the regional and field staff of the CEA. <i>[The</i>

	<i>three member CEA Board can take an administrative decision to empower CEA offices under the NEA through a circular, but this has not been done as yet].</i> • More intensive staff training is required to manage the newly declared environmentally sensitive areas. The short term training provided for management of ESAs through the OU though valuable (covering legal aspects, the Ecosystem Approach, etc) should be expanded and combined with field based training. • Capacity building for EPL and EIA procedure is required at the central, regional and divisional levels. • Full potential of the CEA mid/junior offices appear untapped; existing capacity could be deployed to better effect. • The mid to junior level technical staff have varied educational backgrounds and many have not studied in the biology stream. Hence their knowledge of biodiversity issues is poor. • English knowledge training is required for many DEOs to benefit from the training courses offered through the OU.
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● **Facilities for wetland conservation**

The absence of a special institution mandated with coordination and responsibility for wetlands was identified as a definite setback to the conservation and sustainable use of wetland biodiversity during the preparation of an addendum to the BCAP. This has since been rectified by the establishment of a special unit for wetland conservation within the CEA. A digital database of selected wetland sites and an Environmental Atlas has been developed for Sri Lanka through the Dutch funded Wetland Conservation Project and the subsequent Integrated Resource Management Project (IRMP).

The CEA is the main agency which has so far dealt with overall conservation of wetlands in the country, even though both FD and the DWLC are responsible for conserving wetlands in the areas under their purview. Because of the absence of specific legislation regarding wetlands, or a single agency responsible for management of wetland ecosystems in Sri Lanka, the government granted approval for the establishment of a National Wetlands Steering Committee (NWSC) within the Central Environmental Authority in 1990. Due to its functions as the central coordinating arm between the different line ministries and agencies that have jurisdiction over wetlands, the NWSC was subsequently re-constituted to function under the Ministry dealing with Environment. A special Wetland Unit has been established in the CEA to be responsible for wetland conservation. The coordination of wetland activities is currently done by the NWSC convened by the MOE and the CEA.

Main capacity constraints in the CEA Wetland Unit:

Institutional	The new wetland unit has only three staff members. It needs capacity building by way of trained human resources and equipment if it is to function meaningfully. Capacity built in the past within the CEA is insufficient for its responsibilities as the sole institution primarily responsible for wetland conservation. Most expertise for CEA Wetland Projects in the past was obtained from outside the CEA. This expertise was lost when the projects ceased - baring one officer who is no longer in the wetland unit. Similarly, the infrastructure for the Muthurajawela Visitor Centre was rented, and the building had to be handed over to the owners. The current visitor centre has little facilities. The fact that none of the CEA Wetland Conservation Project (1991-1998) staff have been absorbed into the wetland unit is a constraint, especially in view of the considerable progress made for involving communities in wetland management and livelihood development through this project. A mechanism is required to enable DEOs and regional staff to report threats to wetland biodiversity observed at field level to the CEA, or to the DWLC or FD.
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Individual	• Individuals are somewhat in contact and exchanging knowledge and experiences with appropriate peers. • The problem of isolation of DEOs stationed in DS offices has been somewhat alleviated with the establishment of regional offices. The DEOs are in contact with the relevant regional staff. • Contact between DEOs and the CEA headquarters is inadequate. • Communication with other institutions dealing with wetlands is poor. • The most effective coordination is through links at personnel level among mid career professionals. <u>Specific staff training needs:</u> • Participatory management of newly declared environmental protection areas (in respect to the responsibilities of the CEA). • Identification of threats to biodiversity at field level; identification of alien species and threatened flora and fauna. • Identification of environmentally sensitive areas in wetlands. • Training in effective communication planning and participatory education methods for DEOs who frequently have to carry out awareness programmes.
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The UDA has also prepared Wetland Regulations and Western Province Wetland Zoning for application in urban development programmes. While these have yet to be gazetted, they are already in operation.

4.1.5 The Coast Conservation Department (CCD)

The Coast Conservation Department is the prime agency responsible for coastal issues in Sri Lanka and has a key role to play in conserving and managing coastal and marine biodiversity. The Coast Conservation Act No. 57 of 1981 (CCA of 1981) has vested the administration, control and custody of the Coastal Zone in the Republic of Sri Lanka and appointed a Director of Coast Conservation. The CCA of 1981 has also conferred a legal responsibility upon the Director Coast Conservation to prepare a national Coastal Zone Management Plan (CZMP) which has to be revised and updated periodically. The current mission of the CCD is "sustainable development of coastal resources and the management of coastal processes to optimize social, economic and environmental status of Sri Lanka." The mandate of the CCD for conservation and management of the coastal environment lies within the Coastal Zone.

Due to its mandate, the CCD plays a major role in providing policy guidance for future coastal zone management. In recent years the CCD has also increasingly recognized the need to strengthen its capacity for policy planning and regulation and for facilitating integrated management of coastal resources. The CCA decrees that all developmental activities in the terrestrial coastal areas (300m inland from the shoreline) need the approval of the Director Coast Conservation.

● Structure

The CCD, headed by the Director Coast Conservation, has several divisions: namely: the divisions for Coastal erosion control works, Coastal research and design, Coastal resources management and the Coastguard service (to assist with enforcement of the CCA) which was formed in 2005.

The Director Coast Conservation also devolves some of his responsibilities to the Divisional Secretaries (or their authorized officers) for awarding minor permits (to construct dwelling houses with floor area below 161.6 m², commercial structures below 37.7 m², and for sand mining permits to extract less than 2 cubes of sand) within the coastal zone.

Table 4.2 Management strategies adopted by the CCD for coastal habitat conservation

Type of activity	Activity
Regulatory	- Banning of all activities pertaining to sea coral mining - Permits from CCD made mandatory for all development activities in the Coastal Zone
Education and awareness	- Dissemination of knowledge through printed materials on the value of, and issues pertaining to coastal habitats - Inclusion of facts about problems affecting coastal habitats into the secondary school curriculum - Conducting awareness programmes on different coastal habitats for school children, teachers and key stakeholders
Planning and policy development	- Conservation of coastal habitats through Special Area Management (SAM) Plans at Hikkaduwa Marine Sanctuary and the Rekawa lagoon. 57 SAM and Areas of Particular concern (APC) sites are proposed (of these 8 SAM sites have been established. Some are being managed).
Monitoring	Implementing a monitoring programme on coral and sand mining and water quality testing in coastal areas
Research	- Supporting research on coral reefs and mangroves - Coastal water quality monitoring
Co-ordination	- At the national level: Coast Conservation Advisory Council. - At the local level: The Coast Conservation Coordinating Committee, Steering Committees and Community Coordinating Committees (CCCs)

Source: CZMP of 2004

● Decentralisation

In 2005, 175 officers from the former Coastguard Service of the Ministry dealing with fisheries were brought under the CCD to form the Coastguard Services Division which is now operational at the provincial, district and divisional levels. It is expected to help decentralize enforcement of the CCA. Officers of the CCD, including planners and engineers, are also active in the Western, Southwestern and Southern provincial councils to help engineering aspects of coastal protection and monitoring. Seventy four new graduate recruits under the government graduate recruitment scheme have been physically posted in the Coastal Divisional Secretariat Offices to help with coastal planning and awareness creation at local level. The effectiveness of these placements has yet to be evaluated.

Main constraints/capacity needs/strengths:

Systemic	Political will has been lacking to implement existing policies in the CZMP and to create an enabling environment to do so. Coordination of activities in the coastal zone is complicated due to overlaps in jurisdiction. For example, the UDA has authority over 1km inland from the coastline around the island, while the CCD has jurisdiction in areas 300 m inland of the shoreline. Similarly 2 km seaward from the mean low water mark round the island falls under the jurisdiction of the CCD and the MPPA. The multiplicity of institutions that have to implement the various actions in the Coastal Zone Management Plan requires a more effective and less bureaucratic coordination mechanism than available at present (e.g. the Coast Conservation Advisory Council and the Special Area Management Coordinating Committees serve coordination functions at present).
Institutional	The CCD's research division needs strengthening, although some capacity has been built through the CRMP to address coastal water pollution. Integrated management of SAM sites requires further capacity strengthening to expected objectives.

	Shoreline management which is introduced in the CZMP of 2004 will need staff capacity building through training to understand the concepts and carryout implementation with the necessary cross-sectoral coordination.
Individual	The new recruits (as graduate placements) posted at the district level need considerable training in all aspects of coastal management. The number of CCD officers who help with engineering aspects of coastal protection and monitoring in the Western, Southwestern and Southern Provinces is insufficient.

4.1.6 The Department of Fisheries and Aquatic Resources (DFAR)

The Department of Fisheries and Aquatic Resources (DFAR) is mandated with conservation and sustainable use of marine biodiversity through the Fisheries Act No 2 of 1996. Under this Act, the Minister responsible for fisheries can declare fisheries reserves when and where necessary. There are currently nine Fisheries Management Areas, but no fisheries reserves have been declared as yet. The DFAR is currently under the Ministry of Fisheries Aquatic Resources. It is mandated to formulate/reform conservation policy/laws/regulations in the fisheries sector and to promote or implement relevant laws and policies.

● Structure

The DFAR is headed by a Director General. The divisions of this department (Administration, Fisheries management, Fisheries Industry, Quality control, Monitoring control and Surveillance) are headed by Directors.

● Decentralisation and delegation

The DFAR has Regional District Fisheries Offices in Batticaloa, Chilaw, Colombo, Galle, Jaffna, Kalmunai, Kalutara, and Kilinochchi, Mannar, Matara, Mulatiwu, Negombo, Puttalam and Tangalle.

Main constraints/capacity needs/strengths:

Systemic	Inadequate political will and technical knowledge to implement existing policies and to create an enabling environment for appropriate management of the fishery resource.
Institutional	Inadequate capacity within the DFAR for management of Fisheries Management Reserves with people's participation. Capacity to write project proposals and to lobby for funding (e.g. for stock assessment surveys, etc.) from external donors.
Individual	Training is required for more effective community mobilisation and community participation in fisheries resource management than at present. ○ Skills enhancement for management plan preparation, effective consultation and consensus building ○ Enhancing English language skills (spoken and written) ○ coastal fishery management and community resource management techniques. However, the training received by staff in the DFAR through the CRMP is felt to be under-utilized, partly due to conflicting decisions by policy makers (due to frequent changes of government) that are sometimes contrary to existing fisheries policy. Greater opportunities for overseas study tours for fisheries coordinating committee members (fishers) and Divisional Secretaries are needed to effectively enlist their cooperation. (The study tours through the CRMP are reportedly successful).

4.1.7 The Marine Pollution Prevention Authority (MPPA)

Details and structure and function of the MPPA is given in the baseline report. The MPPA is responsible for warning and promoting prompt remedial action in the event of a major oil spill in Sri Lankan waters, or in adjacent waters that may affect the country's marine environment. It therefore has an important role to play in fulfilling obligations under Article 14 of the CBD, and for conservation of marine biodiversity.

The Marine Pollution Prevention Act No.59 of 1981 established the Marine Pollution Prevention Authority (MPPA) to address the problem of marine pollution. The MPPA is also the focal point for UNCLOS (United Nations Convention on the Law of the Sea), the MARPOL Convention (for the prevention of pollution from ships) and several other international conventions, and is responsible for some functions under the Basel Convention (for control of transboundary movements of hazardous wastes and their disposal).

The MPPA has commenced a programme of work to implement the Marine Pollution Prevention Act of 1981 and for surveillance and regulation of activities within its area of authority, but is severely constrained through inadequate funding and technically skilled manpower. There has been no capacity building relevant for biodiversity conservation within the MPPA.

● Structure

The first Board of Directors of the MPPA was appointed under a Chairman in 1991 with a skeleton staff. At present the MPPA is headed by a Chairman and a General Manager, and has a staff of 35. This includes five graduates recruited under the recent graduate recruitment scheme.

● Devolution and decentralisation

The MPPA has a regional office in Galle which is not fully functional, attributed to the fact that the MPPA Head Office does not have sufficient cadre to make the regional office more functional. The MPPA envisages delegation of various functions at the time of an oil spill contingency to various agencies (i.e. Sri Lanka Ports Authority, Ceylon Petroleum Corporation, Sri Lanka Navy, Sri Lanka Air Force, Sri Lanka Army, Sri Lanka Police, Department of Meteorology, Coast Conservation Department, Local Authorities) to work at both on-shore and offshore levels.

Main constraints/capacity needs/strengths:

There has been no capacity building relevant for biodiversity conservation within the MPPA.

Systemic	The Marine Pollution Prevention Act No.59 of 1981 is not strong enough, and will be repealed and amended to give more authority and functions to the MPPA. The MPPA has prepared a National Oil Contingency Plan (NOSCOPE) to deal with national arrangements for responding to oil spills in the marine environment. It has the dual aims of protecting the marine environment from oil pollution, or if pollution has occurred, to minimize the effects of an oil spill on the marine environment through effective cleaning up operations. This Plan which covers the EEZ¹ was prepared in early 2000 by the MPPA in collaboration with the Sri Lanka Ports Authority (SLPA) -which also has responsibility up to 100 nautical miles seaward of the island. The Plan was revised and approved by the Cabinet of ministers in December 2004. Conceptualisation of the impacts of marine pollution is very poor among policy makers outside the conservation sector, although marine pollution will have very severe repercussions on the fishery and hence the national economy. Due to insufficient understanding and recognition of the importance of MPPA's role, political will is lacking to provide funds to build
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¹ The EEZ coincides with the national pollution prevention zone via a proclamation by the President under the provision of the maritime zones law. This area extends up to the Maritime Boundary between Sri Lanka and India, and up to 200 nautical miles seaward elsewhere around the island.

	capacity in the MPPA for its mandated work. As much of the policies formulated by the MPPA affect shipping (i.e. economics), this is a very sensitive area. Coordination of activities within the coastal zone is complicated due to overlaps in authority. For example, 2 km seaward from the mean low water mark falls within the jurisdiction of both the CCD and the MPPA. However, barring a few conflict situations (e.g. issue of the red tide), there have been no major problems between these departments. Generally the views of the MPPA are sought by the CCD or other relevant agencies during coastal/marine policy formulation or drafting of coastal resource management plans or legislation.
Institutional	If the MPPA is to respond effectively in the event of a major oil spill, considerable capacity strengthening is required. These needs have been identified and requested, but are yet to be addressed. A structural plan for the MPPA has been prepared to strengthen its capacity and to have a central command room/national operations room that is in operation throughout a 24 hour period to enable a quick coordinated response in the event of a major oil spill. This is in abeyance due to inadequate funds. Capacity building within the MPPA in this regard is essential for implementing Article 14 1(d&e) of the CBD. The funds provided to the MPPA by the Treasury are inadequate. For instance the MPPA does not have the equipment to tackle oil spills (e.g. mechanical apparatus such as booms, which are borrowed from other institutions such as the Sri Lanka Ports Authority (SLPA)). This is considered very unsatisfactory by the MPPA. Hence funds are required (a) to build up a stockpile of equipment within the MPPA to deal with an oil spill contingency and maintain such equipment, (b) for staff training, and (c) for recruitment of a highly skilled senior officer to man the national operations command room. There are overlaps in research functions of the MPPA with the National Aquaculture Development Authority (NAQDA) and the National Aquatic Resources Research and Development Agency (NARA). The staff cadre (and expertise) in the MPPA is very insufficient considering the importance and magnitude of activities to be carried out by the MPPA to control marine pollution - especially in the event of a major oil spill to mitigate the impact of such a contingency on the marine environment and the national economy (e.g. the fishery industry can be severely affected). There is adequate communication within the institution via weekly monitoring meetings with the General Manager and staff. There are monthly meetings at which the Chairman participates.
Individual	There is need for: • technical expertise for environmental and economic damage assessment from marine pollution and for framing claims. • a highly skilled senior officer to be in charge of the central command room or national operations room. • Enhancement of technical competence in the scientific, legal, communication, financial and administration fields. • Capacity building for scientific writing, report writing and project proposal writing. • English language skills. The MPPA as a regulatory body should have a group of highly skilled and

	qualified staff. The MPPA does not as yet have a core group of technical experts (marine biologists, etc) to press for certain policy decisions or make claims for compensation in the event of oil spills. <i>[However, the MPPA draws on the expertise in the Marine Research Coordinating Group that it has set up with experts from universities and national marine research agencies].</i>
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4.1.8 The Urban Development Authority (UDA)

The Urban Development Authority (UDA) was set up under the Urban Development Authority Law No. 41 of 1978. (The Town and Country Planning Ordinance No.13 of 1946 also guides the UDA activities to some extent, supported by the Housing and Town Improvement Ordinance, No.19 of 1950). It is the principal institution responsible for the planned development of urban centres in the country. The vision of the UDA “includes guidance, facilitation, and regulation of urban development through innovative and integrated physical planning.”

It is currently mandated to promote the integrated planning and implementation of social, economic and physical development of areas declared as “Urban Development Areas” under the UDA Act. Under this law, the UDA can develop environmental standards and schemes in these areas, and has power to engage in the preparation of development plans for them. The UDA also has control of urban activities in association with other relevant institutions. Though committed to urban development, the UDA is also responsible for conserving the urban environment. It therefore has a role to play in addressing biodiversity considerations in urban areas by discouraging haphazard fragmentation of highland agricultural lands and filling of low-lying lands, and by recognition of agriculture as a major land use and economic activity. The UDA has also prepared Wetland Regulations and Western Province Wetland Zoning for urban development programmes. They are not gazetted as yet, but are already said to be in operation.

The UDA also to develop policy for national Physical Planning. This is hampered by the lack of experts and subject specialists - such as hydrologists - for dealing with urban wetland issues. (The Sri Lanka Land Reclamation and Development Corporation (SLRDC) is also mandated with some aspects of conserving the urban environment).

● Structure

The UDA is managed by a Board of Directors headed by a Chairman. The Director General is the Chief Executive Officer. Both are externally appointed. Altogether the UDA has a staff strength of about 2500 persons. There are three Deputy Director Generals (heading the divisions), two Directors, several Deputy Directors and Assistant Directors (also called town planners). Under them are other Town Planners, Planning Officers and Planning Assistants. The Environment and Landscape Division of the UDA deals with biodiversity related matters.

● Devolution and decentralisation

The UDA has six regional offices headed by Directors, and another tier of regional offices headed by Deputy Directors in Urban Councils. The UDA regional officers have to consult the Head Office for all major decisions; but most of decisions can be taken independently, although concurrence may be sought from the Head Office.

Local Authorities have been delegated limited land use planning and zoning powers by the UDA for issuing building permits. However, complex decisions are referred back to the UDA. The UDA regional officers provide technical guidance to LAs for development activities that require the issue of permits.

Main constraints/capacity needs/strengths

Systemic	Plans and programmes prepared are not finalised due to constant change in political vision due to constant political changes.
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	The UDA has to deal directly with the public, and enforcing adherence to guidelines /policies/laws is made difficult due to political influence.
Institutional	The UDA planning horizon is 10-25 years, while the country's planning vision changes every 5 years due to political changes (i.e. government changes), with associated staff changes at the most senior levels. Thus UDA plans prepared are hardly implemented in full. The UDA develops policy for national Physical Planning. This is hampered by lack of experts and subject specialists. For instance, the UDA lacks technical expertise (e.g. hydrologists) for development of environmental action projects, and often depend on technical expertise provided by other agencies (e.g. SLLRDC). This impedes progress of projects as outside experts, with their own institutional work programmes, do not have adequate time to devote to the UDA projects. The dearth of technical expertise is a serious problem in the Environment and Landscape Division of the UDA. Enforcement of the UDA law and regulations are hampered by lack of field staff (e.g. engineering staff) Financial matters at regional offices have to be constantly referred back to the UDA head office.
Individual	There has been no specific capacity building among individuals in the UDA for biodiversity conservation. Capacity for environmental communication should be strengthened as the UDA has to deal directly with the public. Officers in the regional level tend to refer many decisions to the head office when they could act independently. This is attributed to fear of failure or repercussions, or because they do not want to be accountable for their decisions. (note: this also implies that the regional officers don't have a clearly defined mandate about the decisions to be taken at the regional level).

4.1.9 The Department of Agriculture (DOA)

This department was established in 1912 as the premier institution concerned with research and development for the food crop sector in the country. It is headed by a Director General. The DOA is mandated to deal with rice and other field crops* (such as condiments, coarse grains, grain legumes, and oil seeds) and horticultural crops which include fruits, vegetables, root and tuber crops, ornamental plants and plants of medicinal values. The DOA is also engaged in formulation/reform of policy/law/and regulations pertaining to the agricultural sector; setting up institutional coordination; research at ecosystem, species and genetic levels; and survey and documentation of anthropological and cultural values of agro-biodiversity; sustainable use of agrobiodiversity; taxonomic studies; survey, inventory and monitoring; setting up *ex-situ* conservation centres (including seed banks); *ex-situ* management of species and artificial propagation of endangered species - including tissue culture); and information management and database development.

● Structure

There are several divisions, centres and research institutes under the DOA. These are the: Horticultural Research and Development Institute (HORDI), Rice Research and Development Institute (RRDI), Field Crops Research and Development Institute (FCRDI), Seed Certification and Plant Protection Centre (SCPPC), Extension and Education Division and the Seed and Planting Materials Division. Each Division is headed by a Director.

* classification based on categories used by the Agriculture Department

The research mandate of the DOA covers a hundred crops assigned to three major institutions: the RREDI, the FCRDI at Mahailuppalama which deals with coarse grains, grain legumes and condiments; and HORDI which deals with fruit, vegetable species and root and tuber crops. These three institutes maintain field gene banks for the crops under their purview.

● Decentralisation

The DOA has several Regional Agricultural Research and Development Centres (RARDCs) and a further network of research sub-stations island-wide. The Rice Research and Development Institute (RRDI) has one regional station; the Field Crops Research and Development Institute (FCRDI) located at Maha Illuppalama has a regional center at Bandarawela headed by a Deputy Director. The Horticultural Crops Research and Development Institute (HORDI) has six regional centres.

4.1.10 The extension and education division of the DOA

There is a complex extension service in the agricultural sector at the local level to deal with enhancing cultivation practices, including efficient land management and fertiliser/herbicide/pesticide use. Currently, the agricultural extension services in the country to deal with: (a) direct transfer of technology and know-how from research institutes of the Department of Agriculture (DOA) and their regional centres to the target audiences (farmers), (b) the Provincial Agricultural Extension Services under the district administration with field level extension staff, (c) the centrally operated programme of the Extension and Communication Centre of the DOA, and (d) the extension system operating under the Mahaweli Development Programme. HORDI also carries out extension services at the central and regional levels for farmers growing fruits and vegetables and for the general public.

4.1.11 Natural Resources Management Centre (NRMC)

The Natural Resource Management Centre which functions under the DOA obtains its mandate from the amendment Act of 1996 of the Soil Conservation Act, No. 25 of 1951. This agency deals with formulation and reform of agricultural policy/laws and regulations for the DOA. It is also responsible for promoting and implementing the Soil Conservation Act and for supporting and implementing laws and policies with respect to the agricultural sector.

4.1.12 Horticultural Research and Development Institute (HORDI)

This is the main national institute mandated to undertake *ex-situ* conservation of horticultural crops and for information management and dissemination for horticultural crops. It is also mandated for demand driven research on vegetables, fruit, root and tuber crops in a manner that is productive, eco-friendly and sustainable. HORDI carries out extension services at the central and regional levels for farmers and general public, and thereby promotes horticultural crop development in the country.

● Structure

The Economics and Database Management Division, the Horticultural Research Unit, Fruit Research Centre, the Regional Research Unit at Gannoruwa and several horticultural farms function under HORDI. For purposes of administration, the National Centre for Land and Water Management Studies (NCLWMS) at Peradeniya and the Food Research Unit (FRU) stationed at Gannoruwa are under HORDI.

● Decentralization

HORDI has six regional centres. There are also two officers dealing with horticultural crops at the FCRDI at Maha Illuppalama.

Main constraints/capacity needs/strengths:

Institutional	The government has not recruited Research Officers to HORDI and the agencies under it for the past five years. Hence there is under-staffing in the regions as there are no replacements for senior officers who request and obtain transfers to the Head Office. (The requests are justified as they have been posted in the regional offices for long periods of time).
Individual	Training in communication and education is required for research officers with extension flair. There is a critical need to recruit and train new officers. <u>(Research Officers with extension flair have been found to be more successful at coping with the needs of HORDI's extension service rather than special extension officers who are not proficient in the technical aspects).</u>

4.1.13 Seed Certification and Plant Protection Centre (SCPPC)

This institution addresses plant quarantine and seed health. The National Plant Quarantine Service at Katunayake (headed by a Deputy Director), the Office of the Registrar of Pesticides (headed by the Registrar of Pesticides), the Plant Protection Service at Gannoruwa (headed by a Deputy Director), the Seed Certification Service at Gannoruwa (headed by a Deputy Director) and the Plant Genetic Resources Centre (PGRC) at Gannoruwa (headed by a Deputy Director) function under the SCPPC. The Plant Quarantine Offices at Gannoruwa, the sea port (in Colombo) and the airport (at Katunayake) are each headed by an Officer in Charge (OIC). The SCPPC is responsible for the implementation of the Plant Protection Act No. 35 of 1999, The Seed Act of 2002 and the Control of Pesticides Act No. 33 of 1980 as amended by Act No. 6 of 1994. The latter is enforced by the Office of the Registrar of Pesticides. All exports of plant materials have to be given a phytosanitary certificate through the SCPPC, and all imports of plant material (including food items and horticultural plants or plant parts) have to obtain permits from the SCPPC for importation and release into the country. There are customised agreements drawn up by the SCPPC with specific instructions issued for each importation permit, on a case by case basis.

Main constraints/capacity needs/strengths:

Systematic	Political will is lacking to abide by quarantine laws and policies, which also govern the release of Alien invasive species into the country that will affect indigenous flora.
Institutional	There are several problems and constraints in meeting quarantine needs: Applications for phytosanitary certificates are now sent by post by clients, as the SCPPC lacks facilities to make them available online. The quarantine service at the seaport is functioning relatively well, but the service requires enhancement at the airport. A new quarantine office with fumigation facilities, fridges, microfuge, etc. is critically required. None of the seven labs in the SCPPC used for seed certification are accredited as yet due to the lack of funds to maintain the required standards and facilities for accreditation. Hence Sri Lanka's phytosanitary certificates may not have value in the future.
Individual	GM testing of will very soon become a global requirement. The SCPPC lacks technical and infrastructure ability to meet this need. <i>[Until such facilities are built, building partnerships with facilities at the AgBiotech centre could be explored].</i> The staff need training in plant quarantine and seed certification procedures. This should include post graduate training (M.Sc and Ph. D.) Noxious weeds have been gazetted, and <i>Grama niladharis</i> have been trained by the SCPPC to identify them, but this should be conducted periodically. (The GNs have authority to take action if any one is found in possession of a

'noxious' weed).

4.1.14 The Plant Genetic Resources Centre (PGRC)

The PGRC was established in 1988 under the SCPPC of the DOA with funds from JICA, and is today the main repository of crop germplasm. Its functions are carried out by divisions dealing with exploration, evaluation, seed conservation, biotechnology and data management. The PGRC is mandated for conservation of crop biodiversity and preparation of plans and programmes for the same; setting up inter-institutional coordination; research on crop species and genetic resources, quantification of tangible value of conserving crop biodiversity, taxonomic studies, and the survey and inventory of crop species and their wild relatives. The 5300 accessions from about 100 crop plant species held by the PGRC in 1999 has now expanded to 11,600 accessions from 130 species. This includes about 30 species of crop wild relatives, amongst which there are five species of wild rice - some with very specific disease resistant qualities. In the past, plant characterisation was based on morphological features, but characterisation based on molecular features has now commenced.

The PGRC is well equipped to conserve indigenous plant germplasm of crops and their wild relatives. The Agriculture Department with the PGRC and the National Institute of Agrobiological Science (NIAS), Japan, has carried out a three year collaborative project for the conservation and analysis of wild relatives of crops, which particularly focused on the genus *Oryza* and *Vigna*.

Sri Lanka has considerable expertise in plant genetic resources conservation in terms of agricultural crops compared with several member countries of SAARC, and this was shared through training programmes covering laboratory work and practical research including field work. Capacity building is particularly important in the field of biotechnology and bioprospecting in the agricultural sector.

Main constraints/capacity needs/strengths:

Systematic	Lack of clear direction on access issues in respect of genetic resources held by this centre, and poor conceptualisation of legal issues underlying MEAs impacting on crop genetic resources. Poor coordination with <i>in-situ</i> conservation institutions for conservation of wild plant biodiversity.
Institutional	The PGRC is well equipped to conserve indigenous plant germplasm, but <i>ex-situ</i> conservation is as yet only extended to crops and their wild relatives. Absence of cryo-preservation facilities, although liquid nitrogen is used for biotechnology. The present equipment permits long-term storage of germplasm at 1°C, which is insufficient. [note: better facilities are available with the AgBiotech centre; and partnerships are possible].
Individual	The work of the Centre is constrained by lack of trained staff, especially for biotechnology.

4.1.15 Department of Animal Production and Health (DAPH)

This institute is concerned with research and development in the livestock sub-sector as well as with the conservation of important indigenous livestock species and germplasm. The DAPH is responsible for both devolved and non-devolved services. The mission of the DAPH is to provide leadership for development in the national livestock sector. As such, it is the principal state agency providing technical support for the livestock sector.

● Structure

The DAPH has a staff capacity of about 600 and is headed by a Director General who is responsible for implementing the Animals Act No. 46 of 1988 and the Animal Disease Act No. 33 of 1992. The DAPH has several divisions which deal with Animal Breeding, Animal Health, Planning and

Economics, Finance, and Human Resource Development. Each Division is headed by an Additional Director General. There is an institute of continuing education (ICE) in Animal Production and Health with good residential training facilities. Training is offered to the private sector on request.

● Decentralization

The Activities of the livestock sector are decentralized through Provincial Departments of Animals Production and Health, which are funded by the Provincial Councils. Most of these provincial agencies are under the provincial ministries dealing with agriculture. But the Provincial Directors are under the all island service of the DAPH, and are monitored by the Central Service. There are also several regional Animal Quarantine Centres, including one branch office at the airport. There are farmer training Centres at the Provincial level.

Main constraints/capacity needs/strengths:

Systemic	Absence of a policy for development of facilities for conservation and sustainable use of indigenous livestock resources. The current focus of the DAPH is for increasing productivity of the livestock sector and preventing exotic species and animal diseases entering the country.
Institutional	A Livestock Development Action Plan has been prepared under the GOSL/FAO Project TCP/0169(A). However, this does not contain an institutional mechanism to conserve indigenous livestock genetic resources. There is no link in this plan to the recommendations in the BCAP or the Addendum to develop institutional facilities for animal germplasm conservation. (However, there is understanding in the DAPH and VRI about the value of indigenous livestock genetic resources for livestock improvement). There is no database which documents the origins of livestock genetic resources in the country, which is required for development of a benefit sharing mechanisms under Article 15.
Individual	Skills strengthening is required for biotechnology (cross-breeding) to enhance livestock using indigenous genetic resources The number of vet surgeons in the country at field level is inadequate. Although vet surgeons are called upon to support law enforcement when there are court procedures against the illegal sale of the flesh of protected species, they lack capacity for accurate identification. Similarly, government veterinary surgeons lack capacity for treatment and handling of wild species found in home gardens. Capacity of regional staff for planning and monitoring is considered inadequate.

4.1.16 The Veterinary Research Institute (VRI)

The VRI functions under the DAPH, and is headed by a Director (Veterinary Research). The mission of the VRI is “to be the centre of excellence in research and development in the livestock industry”. Although research in the livestock sector is addressed by several institutions, this responsibility lies mainly with the Veterinary Research Institute (VRI). It is mandated to carry out veterinary research as well as other research in all aspects of animal breeding and genetic improvement. It also carried out research on disease control and regulatory functions, animal feeds, farming systems and production of vaccines (eight have been produced at present, mostly

for cattle and poultry), and human resource development (research training) to meet the objectives of the DAPH.

Conservation of economically important indigenous animal species and the use of traditional varieties of domestic cattle and poultry for livestock breeding is the responsibility of both the DAPH and the VRI. For example, local poultry breeds are used to create better backyard poultry breeds.

4 Structure

The VRI has several divisions that deal respectively with animal breeding and reproductive physiology, and pasture. Each division is headed by a Deputy Director. There are veterinary surgeons under the provincial administration as well as under the central service.

Main constraints/capacity needs/strengths:

Systemic	Inadequate coordination with <i>in-situ</i> conservation institutions for conservation of wild relatives of livestock.
Institutional	Absence of a clear perception of the ‘mandate’ of the VRI among the staff. While the VRI is reputed for its valuable work in the past, it is presently severely hampered by staff shortages and funding. There are no facilities for <i>ex-situ</i> conservation of animal germplasm in the VRI (with similar capacity as at the PGRC for plants) although building such capacity within the VRI has been recommended in the BCAP and the addendum. [A PDF-B Project for GEF funding is being prepared (based on a baseline study under the UNEP-GEF-ILRI- Asia programme) by the VRI in collaboration with the Department of Animal Science of the University of Peradeniya, for the “development and Applications of decision-support tools for conservation and sustainable use of genetic diversity in indigenous livestock and wild relatives”. Some capacity development has been carried out under the Sri Lanka - USDA (United States Department of Agriculture) project by enhancing laboratory capacity and providing equipment and chemicals] There can be partnerships built with the AgBiotech Centre (linked with the Agricultural Faculty of the University of Peradeniya) as it has good facilities for preservation of both plant and animal germplasm and for biotechnology using genetic resources. Details are given in Chapter 4.2. Capacity for addressing outbreaks of disease that can spread to wild species is inadequate due to current staffing and other resource constraints.
Individual	There are no clear performance targets for staff at the VRI. The present mandate of the VRI is very broad, and it has a critical role to play in the livestock sector, especially in the field of animal and human health. However, the dearth of trained staff at the VRI and poor motivation among senior staff to remain at the VRI can create a severe problem which is bound to be manifested in the future. Furthermore, staff sent overseas for post graduate training do not return. Training in cross-breeding and biotechnology is required. There is also poor conceptualisation of biotechnology. The staff strength at 33 scientists is inadequate.

*The AgBiotech Centre has many facilities for Biotechnology research including some sophisticated equipment such as the gene gun, a confocal imaging system and a bioreactor, and all the facilities for DNA fingerprinting.

4.1.17 The National Botanic Gardens (NBG)

The National Botanic Gardens receives its mandate through the Botanic Gardens Ordinance No. 31 of 1928, and is also the focal agency for enforcement of this law. The NBGs were previously under the Department of Agriculture, but are now under a separate ministry dealing with the development of botanic gardens and zoological gardens.

Ex-situ conservation facilities for plants are present in the three Botanic Gardens (RBG) located in the low, mid and upcountry regions of the wet zone. The RBG has over 4000 species under cultivation. It has played a special role in *ex-situ* conservation of plant biodiversity which is one of its objectives, and has pioneered floriculture in Sri Lanka. Among its other objectives are public education on plants, development of technologies related to exploitation of lesser known and under-utilised plants, and development of ornamental and amenity horticulture. Recently the NBG has commenced propagation of endemic species. There are two other Botanic Gardens at Hakgala and Gampaha (Henerathgoda), and two satellite medicinal plant gardens at Ganewatte (on 23 ha) in the North Western Province and the Ambuluwawa Biodiversity Complex at Gampola (covering 300 ha). Two regional Botanic Gardens are proposed: at Hambantota in the dry zone (100 ha) and Awissawella in the lowland Wet zone. A positive feature is that 25% of earnings from the BGs are set aside for the Botanic Gardens Trust Fund.

The National Herbarium functions under the Royal Botanic Gardens.

Main concern/capacity needs/strengths

Systemic	Better coordination is required with <i>in-situ</i> conservation institutions (FD) for conservation of wild plant biodiversity. <i>[Note: There is a Memorandum of Understanding with the Botany Department of the University of Peradeniya for monitoring and survey programmes. Such Partnerships could be built by other institutions for regular survey of biodiversity].</i>
Institutional	Inadequate staff capacity to deal with the technology required for <i>ex-situ</i> conservation of indigenous plant species and biotechnology.
Individual	Due to the fact that the NBG has been under the DOA, overseas training opportunities had to be shared with all the institutions within the agricultural system. Hence staff training has been inadequate for plant propagation for <i>ex-situ</i> conservation. This is expected to be rectified now that the NBGs are under a separate ministry. Training at individual level is required, especially for propagation of endangered species and commercially important species, especially for tissue culture involving laboratory work. The new graduate recruits need training and clear job designations.

4.1.18 The National Zoological Gardens (NZG)

The NZG (established in 1936), the Pinnewala Elephant Orphanage (established in 1975) and the farm at Ganepola (which provides fruits and vegetables for the zoo) come under the purview of the Director National Zoological Gardens. The objectives of the NZG are conservation, animal welfare, breeding and research, education and exhibition. The mission of the NZG is "resource conservation of animals by means of learning achieved through exhibition of species that are adopted with loving care." Its vision is to create one of the world's outstanding zoological institutions, which is a centre of excellence for conservation, research and education. The required development to achieve this status are understood and planned, but are constrained due to inadequacy of funds. Currently the

Dehiwala Zoo has a staff of about 300, and the elephant orphanage has a staff of 180. This includes four veterinary surgeons. The institution is undergoing re-structuring.

The Zoo houses about 3500 animals from 350 species (ranging from mammals, birds, reptiles, fish, amphibians, butterflies and marine invertebrates) in a very limited space of about 10 ha, although annually about 2 million tourists visit the zoo. The NZG offers schools lecture programmes, general awareness programmes. Educational activities undertaken by the zoo include preparation of TV documentaries/videos and CDs. The zoo also actively supports biodiversity conservation by breeding some rare and endangered species, with special emphasis on endemic species. Special features that promote conservation of indigenous species include the walk-in aviary for indigenous birds, the small cats zone and the butterfly garden.

No capacity building for biodiversity conservation has occurred at the NZG.

Main constraints/capacity needs/strengths:

Systemic	There is poor coordination with <i>in-situ</i> conservation institutions for conservation of wild animal biodiversity. Closer collaboration with the DWLC would be beneficial. Coordination mechanisms within the environmental sector and should be enhanced. There is no clear policy for <i>ex-situ</i> conservation in the country. There is also no clear policy on elephant conservation and what should be done with captive bred elephants at Pinnawela. This is a major issue as the Pinnawela Elephant Orphanage has to accommodate 100 elephants within 27 acres which will soon be inadequate. Frequent changes of policy in the recent past and the accompanying government changes have hampered the development of the zoo and its allied units.
Institutional	The capacity constraints are understood by the head of the institution and senior officers at the NZG. There is interest at the senior staff levels to become a key player in <i>ex-situ</i> conservation. A major constraint is the lack of space to expand the NZG and increase facilities for <i>ex-situ</i> conservation, quarantine, rehabilitation and hospital facilities. There is also insufficient staff capacity to further develop <i>ex-situ</i> conservation for specific groups of animals which require different facilities and expertise. There is a need to draw on the expertise of a pool of specialist to strengthen the technical capacity of the NZG for <i>ex-situ</i> conservation through captive breeding. Research facilities at the NZG are hampered due to lack of funds and technical direction.
Individual	There is a dire shortage of trained, skilled and committed staff among the minor staff (e.g. keepers). This is due to staff recruitment based on political patronage (especially at the minor staff level) in the past. As a result the minor staff comprise unskilled workers whereas animal keepers in good zoos in developed countries are university graduates. There are scientific and technical staff who are motivated to carry out research to develop databases required for rehabilitation, captive breeding, and re-introduction. Twenty nine graduates have been posted at the NZG; ten of these recruits have been assigned for education and awareness activities). They need training on: • animal behaviour and species specific captive breeding related to identified threatened species that require special attention. • Communication, public education and awareness.

Other possible clients or beneficiaries were investigated in less detail through the questionnaire survey (Chapter 3). This information has, however, been used in the selection of priority areas and representatives for thematic assessment meetings/mini-workshops.

4.1.19 Environmental NGOs

Present status:

The BCAP (1999) states that "One of the major problems in involving non-governmental organizations (NGOs) in biodiversity conservation and other similar activities is inadequate institutional capability. Although it is widely recognized that NGO participation can substantially enhance natural resources management, unless their institutional capability is strengthened, and they are provided with more resources, they would not be able to realize their full potential. NGOs should play both a complementary as well as a supportive role, and in order to do so effectively their activities should be supported with clear policy initiatives and legal back up." This is very relevant even today and the capacity of NGOs to contribute meaningfully to fulfil the objectives of the CBD have even declined further since the publication of the BCAP.

Despite past capacity building carried out for environmental NGOs in Sri Lanka, many lack the capacity to contribute significantly to biodiversity conservation in the current global context.

There are now no national level NGOs that are skilled in participatory environmental education at the formal and non-formal level, and very few are recognised as having the scientific and technical know-how to be actively engaged in species and habitat conservation. Collaboration between environmental NGOs is also poor. On the other hand, community based organisations promoted by the Forest Department have emerged as having potential to contribute considerably to biodiversity conservation. These CBOs, once established and empowered, have the capacity for mobilization of village communities and organizing community action groups, at the local level.

A very few national NGOs do have:

- High capacity to deal with and train others on legal matters.
- High professionalism in their respective fields.
- Adequate capacity among its members to contribute effectively to *in-situ* and *ex-situ* conservation of species.

However, very few national NGOs have capacity to play a major role in:

- developing national strategies and Action Plans;
- identifying and reporting threats to biodiversity in a timely manner to the respective agencies;
- promoting the recovery of threatened species in collaboration with state institutions;
- preventing introduction and assisting with control and eradicate of alien species that could threaten ecosystems and species;
- reaching the business sector to gain their assistance for biodiversity conservation;
- controlling the risks posed by organisms modified by biotechnology; and
- promoting effective public participation for assessing the environmental impacts of development projects that threaten biological diversity.
- Planning and implementing environmental communication, education and public awareness.
- Evaluating valid EIAs and capacity for BIAs.

Several national NGOs do participate in:

- educating people on environmental topics, supporting nature club programmes, and raising awareness on the importance of biological diversity and the need to conserve it. However, most programmes use conventional methods of lectures, slide shows, etc. rather than use activity based participatory methods. Hence their long-term impact on changing attitudes and behaviour among their target groups is minimal.

Environmental NGO capacity is greatest with regard to community based development, legal issues and carrying out watch-dog functions to prevent damaging development activities. However, the latter function is sometimes jeopardised due to the use of inaccurate facts and figures, and lack of convincing scientific arguments to justify their arguments against action that is perceived as damaging to the environment. NGOs also lack capacity for effective advocacy.

● Overall capacity building needs and possible interventions

Most national NGOs need capacity building to:

- develop and strengthen their institutional mechanisms and competencies;
- establish and maintain infrastructure and equipment to contribute towards biodiversity conservation (mainly due to shortage of funds, but also due to a lack of vision);
- develop and sustain relevant human expertise and professionals on the staff (especially committed young people with good language skills in spoken and written Sinhala and English) to deal with biodiversity conservation and management. This is due to low salaries and social benefits offered by NGOs in comparison to the business sector, and the social benefits in the public sector;
- mobilise available in-country expertise in respect of human resources and expertise for biodiversity conservation;
- prepare project proposals to obtain external funds for biodiversity conservation;
- strategically plan internal and external communication and educational programmes.
- critically review ongoing biodiversity plans and projects in a scientific and constructive manner (they should be able to suggest viable remedial measures).
- negotiate and advocate biodiversity conservation measures effectively with the government or communities.
- access up-to-date information on conservation and sustainable use approaches and technologies.
- prepare scientific reports and publications that are of international standard (A few do have this ability, but many require capacity enhancement).

Possible interventions:

For all NGOs:

- Enhancing skills among selected NGOs with the required focus for participatory environmental education and inculcating public awareness and commitment for biodiversity conservation and sustainable use.
- Skills building for environmental communication planning and implementation.
- Training in project proposal writing, project evaluation and monitoring and project management for all NGOs.

For selected NGOs based on mission

- Training in technical survey and inventory of biodiversity.
- Enhancing technical capacity to contribute more meaningfully towards evaluation of biodiversity conservation policies and projects and sustainable use of bio-resources (e.g. on modern approaches to biodiversity management and species conservation initiatives, ecotourism, managing alien species, biosafety, access to genetic resources and benefit sharing, participatory forestry, etc.).
- Skills building for advocacy and negotiation.
- Providing staff with knowledge, training and scope to play a meaningful watch dog function on the loss of biodiversity, and assist with biosafety, and to curb bio-piracy.

Possible areas for greater NGO involvement in fulfilling obligations under the CBD by NGOs

- A few NGOs have high capacity to contribute towards identifying and monitoring the important components of biological diversity that need to be conserved or used sustainably. This human resource can be utilised by collaborative ventures with the FD or DWLC to train field guides/other relevant field officers in protected areas under the FD and DWLC.
- More specifically EFL could provide legal advice, members of WLNPs could assist with training guides and interested field officers on identification of species (birds, amphibians, etc) in protected areas (under the DWLC and FD) if they are requested' to do so; the green movement is able to offer help monitoring and identification through their network of field officers; and ORDE is willing to work on community development projects in the dry zone. However, these NGOs need to be mobilised by the relevant agencies.
- Several small CBOs at local level are effective in working with communities to promote sustainable use of bio-resources. These CBOs rarely obtain support for enhancing their skills to play a more meaningful role, but are willing to collaborate with state institutions but are not aware how they can do so. (Some are collaborating currently with the FD).

4.2 Previous capacity building for biodiversity conservation and sustainable use

BOX 4.2: Assessing capacity building

- Which relevant projects have been implemented and what are the impacts of these projects, as well as lessons learned?
- What kinds of capacity development projects and activities have been undertaken? What were the short-term and long-term impacts of those projects and activities?
- What relevant technical capacity exists and is the infrastructure available and sufficient to address the objectives of the respective area?
- What human resources are available, and through which organizations, to work on the respective thematic area?
- What training and human resource programmes exist, and what do they offer?

(Source: *National Capacity Self-Assessment Project Documentation*, 2006)

4.2.1 Capacity building for forest and wildlife management

● The FSDP and EMFD Projects

- The Forestry Sector Development Project (FSDP) has built capacity for environmental management in the FD (*relevant for Article 18*). This project strengthened forest management and the establishment of forest plantations to supply timber without exploiting the island's natural forests. It also resulted in the development of an Environmental Management Component (EMC) to the FSDP, which led to the formulation of the five year Environmental Management in Forestry Development Project (EMFDP) which commenced in 1991.

- The EMFDP established a special division (Environmental Management Division (EMD)) to oversee environmental concerns in the forestry sector. This division was responsible for:
 - Carrying out the National Conservation Review (biodiversity assessment) of natural forests in the country following an Accelerated Conservation Review of 31 lowland rain forests (managed as 13 units) with technical cooperation from IUCN - The World Conservation Union (*relevant for Article 7(a) and Article 18*). However, the team members from the FD who participated in this assessment are no longer in the department.
 - Setting up of a database on forest biodiversity (the Environmental Information Management system-EIMS) (*relevant for Article 7(d)*).
 - Comprehensively surveying traditional uses of forests by local communities and their impact on forest biodiversity (*relevant for Articles 8(j)*). However, this was carried out by an external consultant so that the capacity for similar surveys may not be present within the department.

● The Forest Resources Management Project (FRMP)

Under this ADB funded project, the Forest Department is the main beneficiary, with the MOE and CEA as minor beneficiaries under this project. Capacity building under the project targets mainly: *Article 8(j)*, awareness and extension (*Article 13*), agroforestry (*Article 10(b)*), rehabilitation of degraded forests (*Article 8(f)*), buffer zone development (*Article 8(e)*), boundary demarcation of natural forests and forest plantations (*relevant for Articles 8(b) and 8(c)*) and capacity building for forest management (*relevant for Articles 8 as a whole*).

The FRMP has helped to restructure the FD to enhance management and administrative functions, with emphasis on strengthening the decentralised administration.

Technical assistance (TA): provided to the FD as expatriate and local senior level expertise were in the fields of forestry education, forest management and the revision and improvement of the curricula at the Sri Lanka Forestry Training Institute (SLFI). Expatriate TA has been specifically identified for plan preparation (integrated management planning and biometrics), planning and project implementation; data collection and collation, database development and management via technology development (for GIS, and to improve EIMS); commercial forest production, social forestry, public awareness and extension. TA has also been provided to develop technology for research (i.e. forest seed and stand management, tree improvement, etc.), and ecosystem and biodiversity management. However, expertise provided in forest valuation and inventory techniques are specifically considered only somewhat sufficient by the Forest Department.

Local expertise has been provided as TA in many areas, including public awareness, participatory forestry and institutional capacity building, and for improving the NCR database. The FD databases are said to be operating well now, and the NCR database has been made more user-friendly.

Staff training and skills development: About 400-500 persons have received training and skills development. Apart from consultant training, the project has a training programme for capacity building on an annual basis, which offers training both locally and overseas. According to the Forest Department, inventory techniques have been developed, and 10 senior technical officers and 60 middle level technical officers have been trained locally through in-service training courses. The training aspect has been considerably successful, particularly in the areas of forest management and database management.

Equipment: The FRMP has provided equipment and other facilities in-kind, including the necessary computers and equipment for field survey and inventory (e.g. GPS, altimeters, measuring tapes, callipers, etc.) and communication. Financial assistance received for communication, GIS use and forest inventory is considered considerably sufficient to meet long-term objectives.

Financial Assistance: Financial assistance has been provided to the FD to enhance nature based tourism at Sinharaja, Knuckles and Kanneliya forest reserves. This includes infrastructure development (buildings and trails, some visitor centres and accommodation) and training of guides.)

Capacity yet to be built were perceived as (a) implementing the piloted community participation for buffer zone management and forest conservation more widely in wet zone forests, (b)

enhancing capacity among staff for establishing and maintaining effective visitor centres and conducting educational programmes (c) training of guides and providing more guides at the conservation forests (d) capacity for plan preparation, project proposal preparation, reporting and evaluation. (e) communication among target groups to enhance forest conservation rather than the conventional methods of lectures for education and awareness which is currently in use.

● **Preparation of Forest Management Plans** *(relevant for Article 8(b))*:

The concepts of the Forestry Sector Master Plan (FSMP) of 1995 are taken forward by management plans prepared for 16 wet zone forests considered to be of outstanding value in terms of biodiversity and watershed protection. These Management Plans identify site-specific issues and remedial measures including a prescription for a more participatory management approach to be adopted by CBOs, NGOs, local state authorities and the Forest Department. The plans also address linking the management of conservation forests with development activities in the buffer zone *(Supports Article 8(e))*.

● **Community Participation Project (1982-1990) and the Participatory Forestry Project initiated in 1993:**

These projects are considered a milestone in developing understanding of the role of local people in forest conservation in Sri Lanka and for initiating capacity building for participatory forest management *(supports Article 8(j), Article 10 (b))*.

● **The GEF/UNDP funded Southwest Rainforest Conservation Project of the Forest Department (2000-2006):**

This pilot study has aimed to develop a viable participatory management model for wet zone forests in Sri Lanka and was functional in buffer zone villages along the southern perimeter of the Sinharaja Reserve and the perimeter of the Kanneliya Forest. The project has built capacity for community mobilisation and led to the formal registration of existing CBOs in these villages that were set up by the Forest Department. This approach has taken into account the conservation status of the relevant forests, the level and type of forest dependency among local people, and the national forest policy *(supports Article 8(j) and 10(b))*.

Training: The project has served to develop skills among about 200 people for biodiversity conservation, protected area management and preparation of management plans. The trainees include Assistant Conservators, foresters and other field officers. The training has been provided both locally (as in-service training and one-day workshops) and overseas. This component is considered considerably sufficient to meet long-term objectives of the project.

● **The Aus-Aid funded Sri Lanka Australia Natural Resources Management Project (SLANRMP)** for poverty reduction through improved natural resource management SLANRMP: Sri Lanka - Australia Natural Resources Management Project.

The project has been active in two dry zone areas in the Kurunegala and Matale districts since February 2003 to support communities improve the management of natural resources through a participatory and holistic approach by improving household income through improved use and integration of forest and agricultural resources. The project is expected to provide opportunities for institutional capacity enhancement and human resources development in the forestry sub-sector.

The project aims to ultimately build capability for handing over the management of these degraded forest patches to adjacent villagers. They will benefit from enhanced household income due to improved land use and integration of forestry and agriculture. The project specially targets communities that are dependant to varying degrees on the adjacent forests for their livelihood, and are thus willing to accept responsibility for community management of forests in exchange for forest user rights. Women and disadvantaged members are given special attention.

This project is a pilot research project and not a development project *per se*. It is to test an appropriate development processes that the Forest Department could implement through its institutional programmes on a routine basis. Phase I of the project has concentrated on testing different approaches at selected sites in four dry/intermediate zone districts. Phase II - is now concentrating on testing the implementation process.

A Training of Trainers course is being developed for the FD, CBO and NGO staff to ensure continuation of training and extension when the project ceases. The purpose of the project is to develop and apply models for improved and equitable natural resource management in the dry zone areas of Kurunegala and Matale districts, and to disseminate the results nationally. The ultimate goal of the project is to contribute to poverty reduction through improved natural resource management in the dry zone of Sri Lanka.

- **Setting up of the Sri Lanka Forestry Institute (SLFI) at Moon Plains**, Nuwara Eliya, in 1987 with USAID funds has served to provide in-service training for Forest Department staff. (*relevant for Article 12*).

- **The World Bank/GEF funded project for the conservation and sustainable use of medicinal plants in Sri Lanka**

This project was carried out by IUCN-The World Conservation Union and the Ministry dealing with Indigenous Medicine. The Forest Department has also carried out a component of the Medicinal Plants Project in several medicinal plantations established in Matale, Ritigala, Balangoda and Bibile.

Technical Assistance: This has been provided by expatriate and local senior level experts to the Bandaranaike Memorial Ayurvedic Research Institute for technology development, research, information collation and database development. The expected capacity building gains from training in the BMARI appear modest.

- **The Global Environmental Facility Project (1992-1998)**

This investment programme implemented during the 1990s received funds from the Global Environmental Facility via the World Bank to strengthen the capacity and capability of the DWLC to perform its functions. The project was administered by the UNDP with the FAO as a collaborative implementation agency, and it was nationally executed by the DWLC which was then under the Ministry of Public Administration, Parliamentary Affairs, Home Affairs and Plantation Industries. This project envisaged:

- Preparation of Resource inventory based viable management plans for protected areas (*relevant for Article 8b*).
- Piloting an eco-development plan for a wildlife area to test implement participatory management (*relevant for Article 8(j)*).
- Supporting wildlife research with specific emphasis on management utility of results (*relevant for Article 12(b)*).
- Developing capacity to minimise human elephant conflict and conservation of elephants (*relevant for Articles 8(c) and (d)*).
- Carrying out multimedia based awareness campaigns, specially addressing park visitors, local communities and students (*relevant for Article 13*).

The staff capacity enhancement aspect through this project is identified as very modest at best. However, the development of the national training centre for wildlife management at Giritale setup in 1992 with funds from USAID is considered a major output of this project. This centre is used for training wildlife rangers, range assistants and guards in the DWLC (*relevant for Article 12(a)*). Recruitment of Assistant Directors from the scientific service also commenced through this project, and about 150 other staff were recruited through the GEF project. The main reason underlying the relative failure of this project could be that many departmental staff considered the

project as a separate entity. This shows a lack of staff mobilisation and internal communication to help position the project and motivate staff to be stakeholders and beneficiaries under the project.

● **Protected Area Management and Wildlife Conservation (PAM&WLC) Project** with funding from the Asian Development Bank (ADB,) the Global Environmental Facility (GEF) and the Netherlands Government.

The executing agency for this project is the MOE. The major beneficiary under the project is the DWLC; other beneficiaries are the Biodiversity Secretariat of the MOE and the Protected Area Conservation Fund. This investment project envisages capacity strengthening of the DWLC to promote biodiversity conservation. The main objectives of the project are: (a) enhancing institutional capacity in the DWLC for wildlife management, (b) promoting participatory adaptive management, (c) facilitating collaborative conservation planning, and (d) sustainable financing for community partnership building. The project is continuing and the success of the project is yet to be assessed.

Institutional strengthening and human resource development in this sub-sector are envisaged through the project by updating DWLC staff knowledge, providing staff training, building technical and managerial competence in the DWLC, and development of institutional potential. The latter objective is to be achieved by:

- **Enhancing Management in eight Protected Areas** (namely the Peak Wilderness Sanctuary, Horton Plains National Park, Ritigala Strict Nature Reserve, Bundala National Park, Wasgamuwa National Park, Minneriya National Park, Kaudulla National Park, and the Udawalawe National Park that are selected as pilot sites (*relevant for Article 8, mainly 8(b)*).
- **Addressing alien invasive species:** Pilot research on invasive species eradication has been done (*Article 8(h)*).
- **Restructuring of the DWLC** to make it technically competent; decentralization of administrative and financial systems to provide more autonomy to regional offices; upgrading infrastructure and providing the required new infrastructure (e.g. "wildlife villages" for staff (i.e. quarters), roads, observation facilities, etc).

Implementing participatory adaptive management in PAs and enhancing community participation (*relevant for Article 8(j)*) and facilitating buffer zone community development (*relevant for Article 8(e)*):

Achievements by the DWLC:

- At present about 220 social mobilizers and 127 villagers have been trained through the PAM&WC project.
- Social mobilization has been carried out in buffer zone villages around the seven parks (i.e. Kaudulla and Minneriya are considered one unit).
- A core group of social mobilisers, comprising one from each of these parks, have been selected from the DWLC. The selection is based on potential skills for social mobilization.
- The community projects are currently functional at the Wasgamuwa National Park, and the Kaudulla National Park. In the KNP several poacher families have been identified as the first beneficiaries under the irrigation scheme.
- At present the social mobilization process is carried out by a consultancy firm hired under the project. The social mobilization has been preceded by awareness programmes for local state sector officials, *Grama Niladharis*, *Samurdhi Niladharis*, etc.
- Monitoring the success of this component is ongoing. Overall, participatory management has still to be developed at the DWLC for application on a wider scale. Although setting up of Trust Funds for CBOs (as done by the Forest Department) is proposed, this has not been done so far.

- **Developing visitor service plans for the pilot sites, and providing enhanced visitor facilities and visitor centres complete with interpretive material.**
- **Biodiversity assessments in the eight pilot PAs and habitat mapping have been carried out to systematically monitor biodiversity in PAs and to enable zoning (*relevant for Article 7*). A gap**

analysis has been carried out in wildlife areas to assemble a strategic portfolio of conservation sites for Sri Lanka (*relevant for Article 7(a)*). The gap analysis envisaged formation of base maps, preparation of a condition index for vegetative type conservation targets, mapping of dry zone endemic species, mapping of fauna (amphibians, agamid lizards, marine turtles, bird eating spiders, snails), flora and rock outcrops.

Achievements by the DWLC:

The habitat mapping of the pilot PAs and the gap analysis have been completed. The biodiversity surveys, including vegetation surveys, have been completed and the habitat and disturbance maps and voucher specimens have been prepared. Databases are being prepared for the pilot sites. Viability indices have been prepared for vegetation sites. However, the capacity built among DWLC staff for such surveys is not clear.

- **Research in the pilot areas has been outsourced to universities, IUCN Sri Lanka, IF5, and other private entities.** However, the research capacity built among DWLC staff through this component is not clear.
- **Establishing a rational well-represented PA system in the country (*relevant for Article 8(a)*) and instituting a system of research and survey yielding relevant information to support management (*relevant for Article 12 (b)*):** This has not been addressed as yet.
- **Strengthening the GIS unit to help strategic planning and improving park management (*relevant for Article 7(d)*):** Two people have been trained on the use of GIS. Training manuals on map reading, GIS, GPS and remote sensing have been prepared. A centralised database is being established at the DWLC. A data sharing policy and mechanism is being worked out.
- **Eliminating deficiencies in the legal system for biodiversity conservation to conform to the current Wildlife Policy (*relevant for Article 8(k)*).** The FFPO has been revised and forwarded to the Legal Draftsman's Department.
- **Strengthening inter-sectoral biodiversity conservation actions (*relevant for Article 6(b)*).**
- **Preparation of implementation plans for the recovery of endangered species (*relevant for Article 8(c) and 8(l)*).** This is in progress in collaboration with the MOE.
- **Assisting the Biodiversity Division of the Ministry of Environment and Natural Resources to prepare an addendum to the National Biodiversity Conservation Action Plan published in 1999 (*relevant for Article 6(a)*).** This is in progress. However, the response from several NGOs suggests that the process used for preparation of the addendum may not have been adequately transparent to obtain the consensus of all stakeholders.

The PAM&WC project has provided:

Technical assistance: This is by way of expatriate and senior local/experts for management plan preparation (i.e. management and tourism plans in Protected Areas), GIS use, eco-tourism development, data collection and collation, database development and management. The latter includes technology development (GIS) to promote ecotourism and adaptive management in the DWLC. This is considered by the DWLC to have been very successful.

Training: Senior level and field staff of the DWLC have been trained in specialised areas through the project. Several senior officials have been sent for study tours abroad. Local training has been provided on wildlife management and planning, ecotourism and visitor management, participatory buffer zone management (micro-enterprise development, community outreach, participatory rural appraisal, micro-planning, habitat management, human-elephant conflict management), computer programming, usage of communication equipment, public relations, generating publicity and awareness raising, enhancing English language skills and office management (e.g. government tender procedures, office administration, disciplinary procedures, accounting, etc.). Overall, about 860 DWLC officers and 2500 community members have been trained in various aspects of wildlife management, both in Sri Lanka and overseas.

Although overseas training has been provided, this is well below project targets. The training programmes through study tours have been considerably delayed, and inadequate attention has been given to this crucially important component during the initial stages of project implementation. The funds under the project for overseas staff training (in India, Nepal, and Philippines) have not been fully utilised. Consequently the training of community members and administrative officers has been delayed. Furthermore training in wildlife conflict management in South Africa (for 15 people), community outreach (for 24 people), wildlife management and ecotourism in Nepal (for 21 persons) is pending.

Communication facilities have been upgraded at the Giritale National Park with the Wildlife Training Centre (*relevant for Article 12(a)*). However, accommodation facilities are very inadequate at this centre for trainees and needs upgrading and better maintenance.

4.2.2 Capacity building for managing coastal and marine biodiversity

● The CCD/GTZ funded Coast Conservation Project (1988-1996)

Technical assistance: The CCD has been provided expatriate and local expertise for plan preparation, technology development for research, project/programme implementation, information collation and data base development. This aspect is considered considerably successful. The project has also dealt with staff training and skills development on coastal erosion management and coastal zone management. Coastal engineers, scientists and economists have been trained both overseas and locally. This aspect is considered considerably successful by the CCD.

● The USAID funded Coastal Resources Management Programme - Phases I and II (1985 - 1991, 1991-1997)

Technical assistance: Technical assistance provided by expatriate and senior local experts for plan preparation, planning project implementation and project/programme implementation has been considerably successful in meeting project objectives.

Training: Coastal zone planners and engineers have been trained for coastal zone planning and management. This included training through scholarships at universities overseas. Sufficient funds have not been available for capacity building in other sectors, however.

● The Coastal Resources Management Project (CRMP) from 2000-2006

The Coastal Resource Management Project (CRMP) was a major initiative of the then Ministry of Fisheries and Ocean Resources, with funds from the ADB, the Netherlands Government and the Government of Sri Lanka.

Technical assistance: Overall, capacity building aspects that promote biodiversity conservation and management under the CRMP are mainly through the CERM and IS components through which approximately \$1 million had been allocated for Technical Assistance. The project has supplied both local and expatriate expertise mainly as assistance for plan preparation, planning project implementation, programme implementation (e.g. assistance to revamp special area management by the CCD), and for rehabilitation and restoration of habitats, and to a lesser extent to assist technology development for research (e.g. GIS use for studying water quality). Provision of Technical Assistance is considered to have met with its long-term objectives fully.

Training: The CERM component has also carried out staff training and skills development for resource management, project management, GIS use, monitoring and evaluation. Through the CRMP, about 50 persons (Divisional Secretaries from 10 coastal DS divisions from Negombo to Tangalle, Field Unit personnel of the CRMP project, and Fisheries Inspectors who are also represented in Community Coordinating Committees (CCCs) at Special Area Management (SAM) Sites) have been trained through study tours overseas. Local training has been provided to the CCD for project monitoring and evaluation, use of GIS, water quality assessment, land use planning and benefit monitoring.

Overall 76 persons have been trained overseas, and 642 have been trained locally in the Ministry dealing with Fisheries, DFAR, CCD, NARA and the Ceylon Fisheries Harbour Corporation (CFHC) and the project management officers as well as community members and Divisional Secretaries.

Equipment: Target institutions have been provided with GPS and GIS facilities, audio visual equipment (multimedia), and water testing kits (for NARA and CCD).

Community outreach: This includes sanitation improvement for coastal communities.

Component B of the CRMP for Institutional Strengthening has covered several aspects that are relevant for biodiversity conservation and sustainable use, amongst its broader objectives. This component has dealt with enhancing institutional arrangements within key agencies of the Ministry of Fisheries and Aquatic Resources (MFAR); enhancing capacity for updating the Coastal Zone Management Plan for the CCD (CZMP),

- **Assisting the Ministry of Fisheries and Oceanic Resource (MFOR) by:**
 - providing assistance for drafting of a new Fisheries Sector Policy, a new Fisheries Act and regulations and a new Coast Conservation Act.
 - preparing a series of project proposals for fishery resources studies (*relevant for Article 12(b)*) with which the DFAR or MFAR could approach various funding agencies for stock assessment. Due to varied reasons resulting from the tsunami², the incentive to manage the fishery for conservation and sustainable use has been receded considerably despite existing knowledge about the state of the resource.
 - Capacity building of officials in the fishery sector has been done and not much more can be done. There are a few exceptions such as capacity building for community participation in resource management through the fisheries coordinating committees. The crucial need in the fishery sector is identified as the political will to support correct management practices.
 - Instituting a programme of Information, Education and Communication (IEC) to improve awareness of the issues in the fisheries sector and a better understanding of sectoral management issues that will lead to the formulation of viable and durable interventions by sector institutions (*relevant for Article 13*). The IEC programme has improved tremendously through project interventions, and has become a functioning unit. It is at present producing promotional material such as brochures, etc. that can be used for fishermen, officials and politicians.
 - Setting up a basic management information system/framework whereby the main line agencies in the fisheries sector and their outlying offices could be connected electronically, to enable exchange of information and data with the MFAR (*relevant for Article 7*). Under this an IT programme and a data gathering network has been developed within the ministry, and there is a pilot programme for 18 months to gather catch and effort data as a first step towards interpreting the biological state of the fishery. This is working well.
- **Institutional strengthening of the Coast Conservation Department (CCD) includes:**
 - Setting up of a GIS unit in the CCD with the required GIS facilities and a database to assist the department's functions and to enhance capacity for Integrated Special Area Management Planning in the coastal areas (*relevant for Article 6(a)*).
 - Assistance for conservation and mapping of coastal habitats and sites of archaeological, historical and scenic value; erosion management and controlling coastal water pollution and identification of coastal land use patterns and sites for future development (*relevant for Article 7(d)*).

² Although about 8000 fishers perished during the tsunami, the post-tsunami fishing effort has grown, as more people have come into the fishery than before with the influx of boats, nets, and outboard motors received from donors without heed to existing fisheries policy. Further, the CEYNOR Corporation also produced boats and fishing gear with the assistance of tsunami funds. This was done despite compelling evidence of over fishing before the tsunami and the pre-tsunami policy decisions to remedy this situation.

- Technical assistance from expatriate and senior level local experts for plan preparation and updating the CZMP; project planning, data collation, development of a GIS unit and database development. This component is viewed by the CCD as helpful and successful.
 - Strengthening the research division of the CCD, to especially address the problem of coastal water pollution by study of ambient water quality in coastal areas (*relevant for Article 12*).
 - Training/skills development for coastal zone Management, EIAs, coastal water quality monitoring, and for project management and monitoring. The training was carried out locally and overseas which include several study tours.
 - Recruitment of a legal officer to the CCD.
- **Institutional strengthening of the National Aquatic Research and Development Agency (NARA)**
The IS programme envisaged re-establishment of some of the core programmes of NARA, including applied fisheries science and fishery research programmes to complement the overall fisheries management programmes (*relevant for Article 12(b)*). This aspect has not been successfully achieved because:
 - NARA has not responded to the help offered via the project to develop a more holistic programme in line with a clear national mission. As such the institutional programme constitutes ad hoc responses to coastal and aquatic system research needs.
 - Recurrent changes of the Director General and Chairpersons (there had been three chairpersons during the period of the CRMP), and the differing perception of institutional mandate by subsequent institutional heads, has precluded the establishment of a stable institutional programme for NARA.
 - Data gathered by NARA (e.g. fisheries data), from which assumptions on coastal resource and habitat conservation and sustainable use should be made, are not fully utilised as they are not publicly (or institutionally) available. This is partly because research data lie with the respective researchers who are reluctant to release unpublished research information due to poor research ethics in the country and the consequent possibility of plagiarism.
 - **Assisting the Department of Fisheries and Aquatic Resources (DRAR):**
The IS component has sought to enhance fisheries management and to build durable relationships with major stakeholders, enhance information management and broaden the range of management options. This includes study tours for key managers for sector development and a comprehensive training programme for sending officials overseas on study tours to enable a better understanding of the correct approaches to resource management. Despite this, and the fact that the correct people were sent for training, the skills, training and knowledge gained by them is not being applied to full use due to the lack of political will, compounded by the response to the tsunami. The IS component has also sent out 10 Divisional Secretaries in coastal areas which has proved to be very successful in motivating them to assist with coastal resource management.

The MPPA has not been a recipient of capacity building as yet although they have a role to play for implementing Article 14 of the CBD.

4.2.3 Capacity building to manage wetland biodiversity

● The Wetland Conservation Project (WCP)

This project, initiated by the CEA in 1991 received funds and technical expertise from the Netherlands Government up to 1998. It was implemented through the wetland unit in the CEA established through the project. The WCP heralded significant measures for the conservation of wetlands in the island and was instrumental in prioritizing wetlands for conservation and management. This involved carrying out site surveys and preparing site reports for 26 wetlands of which ten are management plans. These plans envisage a sustained yield of multiple benefits with minimum resource use conflicts within a framework of preserving the ecological, cultural and social values of the wetlands. The project was also engaged in creating public awareness on wetlands and

their values, development of methodologies for conservation, setting up a digital database on wetlands, development of a wetland evaluation system and formulation of criteria for selection of wetlands for total conservation.

Phase II of this project termed the Integrated Resource Management Project (IRMP) focused on Muthurawela Marsh and the Negombo Lagoon, and on implementing the Muthurajawela Management Plan. Some SAM sites under the CCD have been identified as wetland sites requiring conservation and management. GIS capacity was developed through this project.

The wetland unit in the CEA, however, became dysfunctional after Phases I and II of the WCP ended, and has only recently been re-constituted. Although these two projects were expected to provide the necessary capabilities within the relevant institutions for wetland management within the CEA, the follow up to this project has not been satisfactory and many of the wetlands sites targeted for conservation now considerably neglected.

4.2.4 Capacity building for environmental management

● The Environmental Action 1 Project (EA1P)

This World Bank funded project commenced in 1997 for duration of five years to enhance capacity for environmental conservation and regulatory aspects with the aim of building adequate institutional capacity for environmental conservation and assisting the Government of Sri Lanka to develop a coherent institutional and policy framework for environmental management. The project focussed on strengthening the Ministry dealing with Environment and the CEA, mainly by way of institutional restructuring and human resources development within the Ministry and the CEA through staff recruitment and training. This project involved:

Restructuring and staff recruitment for enhancing individual capacity in the CEA and the MOE to enhance institutional capacity to meet functional requirements. This enabled recruitment of new staff to the CEA and the MOE, restructuring the 'divisions' within these agencies.

Strengthening environmental capacity at the sub-national level was done by posting CEA staff called Divisional Environmental Officers (DEOs) in district/divisional secretariats to help decentralise environmental management, and to help better address environmental issues at the local level. This also enabled creating eight regional offices in the CEA and creating eight regional offices in the CEA.

Training: Training has been provided both locally (i.e. through in-service and assignment based training) and overseas. The local training included a post-graduate diploma on environmental management conducted by the Open University of Sri Lanka (OUSL) for 50 officers from the Regional Offices and 300 DEOs and Environmental Officers (EOs) at CEA headquarters. This diploma offered courses on Biodiversity Conservation and Management and Environmental Policy Planning. Most trainees had no previous science or environmental training.

Other activities envisaged through the project are:

- Accreditation of the CEA environmental laboratory to assist with EIA and EPL procedures.
- Carrying out a series of policy studies to assist policy formulation
- Developing an environmental database for the environmental protection division of the CEA;
- Assisting the CEA to streamline EIA procedures and prepare an EPL manual, review environmental standards and develop a load based license fee for the EPL scheme.

4.2.5 Capacity building for biodiversity information management

● Natural Resources and Environmental Policy Project (NAREPP)

The goal of this project was to strengthen the public sector policies and institutions for improved management of environmental issues including biodiversity conservation, coastal resource management, participatory watershed resource management [through the Shared Control of Natural Resources (SCOR) project], and public participation in environmental management by strengthening NGO activity (*relevant for Articles 8 and 10*).

This project also specifically assessed the systemic, institutional and individual capacity building needs for biodiversity valuation and information management, with significant inputs for preparation of the Biodiversity Conservation Action Plan (*relevant for Articles 11, 7d and 17*). This project therefore supported a comprehensive inventory of biodiversity related databases (present at the time) and the preparation of a directory of all biodiversity information sources (institutions and datasets) for the Ministry then dealing with the subject of Environment.

● **Setting up of Vidatha Resource Centres (VRCs)**

This project, now in progress, though not specifically targeting biodiversity information management, can open up considerable opportunities for a large segment of society to provide biodiversity related information, and is particularly a gateway to reach rural communities. It is built on similar principles to Village Knowledge Centres (VKCs) in India. These VRCs aim to promote science and technology in rural areas, and to generate income and create job opportunities at the village level. This is done by establishing community societies known as *Vidatha* Societies, a network of resource centres known as *Vidatha* Resource Centres (VRC), and bringing together all other R & D centres in government, semi-government and private sectors - including NGOs - to provide the required technology. One VRC will be established in each Divisional Secretary Area. These centres will be manned by one S&T Officer, a computer operator and a field coordinator. Facilities such as internet, e-mail, fax and computers will be provided to each of these centres. The NSF has developed awareness programmes and thematic research programmes to complement this programme.

4.2.6 Capacity building for biotechnology based on genetic resources

● **The ADB sponsored Science and Technology Manpower Development Project**

This project was implemented by the Ministry dealing with Science and Technology. It identified biotechnology as a thrust area for future development in the country. This project has enhanced the quality of research and development capability among environment, science and technology manpower in the country. Under this project, the Chemical and Environmental Technology Division of the Industrial Technology Institute has been strengthened and Biotechnology Centres have been established in the Universities of Colombo and Peradeniya (AgBiotech Centre at Peradeniya), supported by attempts to provide linkages with industry. The AgBiotech Centre has been provided with many facilities for biotechnology research including some sophisticated equipment such as the gene gun, a confocal imaging system and a bioreactor, and all the facilities necessary for DNA fingerprinting. This information is available in the database prepared by the biosafety framework project.

● **The Sri Lanka-US Department of Agriculture (USDA) Germplasm Development Programme from 2001-2007**

The Department of Agriculture is engaged in 15 collaborative programmes in biotechnology through this project. These projects include:

Assistance to the PGRC: This comprises technical assistance from local senior level experts for assistance in plan preparation, programme/project implementation, technology development for research, information collation and database development for the PGRC. The project has provided a PCR, Aju spectrometer and herbarium sheets. This component has been somewhat successful in meeting project objectives, but the overall success of the project has been rated as low by the PGRC.

Assistance to HORDI: This project involves survey of wild relatives of crop plants, under utilised fruit species; germplasm collection and data base development, selection and *ex-situ* propagation in home gardens. Technical assistance has been provided by way of local senior level experts for data collection and database development. These aspects are considered somewhat successful in meeting project objectives.

The project has provided computers, GPS for tree location recording, and cameras to obtain images for database reports, equipment for tissue culture laboratories for propagation and multiplication,

lab equipment for physical characterisation of fruits and field equipment for propagation trials. This component has been considerably useful

● **The Agricultural Products and Biosafety in Asia (funded by FAO) project of the PGRC.**

This project involves ten countries in the region. The objective of the project is to strengthen national capacities in biosafety aspects related to crops. A database has been established to monitor conservation and use of plant genetic resources for food and agriculture via an FAO project. The software has been provided, on the basis of providing the information to the Donor. This will be shared with the DOA.

● **The Crop Wild Relatives Project carried out by the PGRC (at PDF B stage for GRF funding).**

The objectives of the project are to identify the status of wild crop relatives conservation in Sri Lanka in respect of *in-situ* and *ex-situ* activities. The expected outputs of the project are:

- Development of an information management and access system.
- Capacity to undertake *in-situ* conservation with local communities.
- To review and share current experiences on conservation of crop wild relatives at the global level.
- To develop a framework for an information management system with national and international features that will support improved conservation and use of wild crop relatives.

This project is initially concentrating on wild crops but will be expanded to cover the herbarium data available at the Royal Botanic Gardens(RBG).

● **The DOA/PGRC and National Institute of Agrobiological Science (NIAS), Japan Project**

This is a three year collaborative project for the conservation and analysis of wild relatives of crops, which particularly focused on the genus *Oryza* and *Vigna*.

● **The 3rd Country Training Programme of PGRC/JICA (2000-2004)**

This project has addressed capacity building in the PGRC by providing technical assistance from both expatriate experts and local senior level experts for plant genetic resources conservation and management. This has been considerably successful as the project has provided much needed equipment such as computers and multimedia projectors and text books. This project to conserve wild plant biodiversity offers opportunities for inter-institutional collaboration for *ex-situ* conservation of wild plant biodiversity, and for collaborative programmes between the Forest Department and the PGRC (*relates to Article 9*).

● **National research funding for biotechnology development**

The National Research Council (NRC), the Council for Agricultural Research Policy (CARP) and the National Science Foundation (NSF) have identified priority areas for research in biotechnology. The NSF provides funding for biotechnology research through its Biotechnology Committee. The Ministry dealing with Science and Technology and the then Ministry dealing with Agriculture have instituted programmes for training at various levels and for providing the required equipment. Several training programmes have been carried out within the country on specific areas. The AgBiotech Centre at Peradeniya conducted the first training programme in Sri Lanka on Genetically Modified Organisms (GMOs) and Functional Food Product (FFP) testing with funds from the biosafety framework project. The staff at the AgBiotech Centre continue to conduct training programmes, short courses and demonstrations.

4.2.7 Capacity building for biosafety

⊙ The Biosafety Framework Project (supports Article 19)

The MOE as the National Focal Point for the Cartagena Protocol on Biosafety was the Project Executing Agency for the UNEP/GEF funded National Biosafety Framework Development Project for Sri Lanka. The project commenced in May 2003 and was completed in 2005. The overall objective of Sri Lanka's national biosafety framework was to ensure that the risks likely to be caused by modern biotechnology and its products will be minimized and biodiversity, human health and environment will be protected in a maximum way; the transboundary movements of GMOs would be regulated through formulation of relevant policies, regulations, technical guidelines and establishment of management bodies and supervisory mechanisms. The initial biosafety framework that has been prepared examines the existing legislation and their relevance to biosafety; it also identifies priority projects in terms of a biosafety administrative/management system (including notification and authorization, risk assessment and management, etc), a local biosafety clearing house mechanism and requirements for monitoring and enforcement. A national policy on biosafety was also prepared through the national biosafety project. This received Cabinet approval. A national database on biotechnology and biosafety related institutions, experts, policies and laboratories was prepared, and a website on the project was launched. However, it has not been possible to make the database available on the web as yet due to funding constraints in the BDS.

Under this project many awareness programmes on biotechnology, GMOs and GM foods have been conducted in all provinces, except the North and East, for farmers, school children, university students, scientists and policy makers. Despite this, awareness of biosafety issues among the general public remains low. The project has therefore identified several priority areas for capacity building to promote biosafety in the country. Chief among these are:

- (a) strengthening publicity and public education on biosafety, and
- (b) strengthening public participation in decision making on biosafety.

In the interest of ensuring transparency in the process, a system of public notification as with EIAs has been suggested, with a provision that all applications should be open to the public and to publish the decision once it has been conveyed to the applicant.

Phase II of the biosafety framework project is expected to commence implementation of some of the recommendations made under Phase I.

4.2.8 Capacity building for biodiversity education and awareness (Article 13)

⊙ Identification of problems and constraints for environmental education at school level

A project for identification of problems and constraints for environmental education in secondary schools was carried out from 1989 - 1993 by March or Conservation and the Natural Resources, Energy and Science Authority (NARESA). This provided a comprehensive review of capacity gaps for inculcating environmental knowledge, attitudes and skills among school children, along with remedial action suggested by the teachers who were consulted. The project was carried out in collaboration with the National Institute of Education - the institution responsible for curriculum development.

In response to the 1989-1990 NARESA-MfC Environmental Education Project (Phase I), a follow-up project targeted teacher training and skills enhancement to promote environmental education at school level for years 6 - 9 in collaboration with the National Institute of Education (Phase II). The programme included training teachers on innovative and participatory environmental education methods, preparation of supplementary educational material for students (posters and booklets on topics identified by the teachers), and field training of teachers at the Sinharaja and Horton Plains reserves. A parallel project by the March for conservation produced work books for teachers and other educational material for secondary schools. There have been no similar project since then.

● **The Biodiversity Skills Enhancement Project (BSEP)**

This project was carried out by March for Conservation in collaboration with the Ministry of Environment (then Ministry of Transport, Environment and Women's Affairs) and IUCN - The World Conservation Union in 1995-1996, with funds from the McArthur Foundation. It sought to enhance the knowledge of biodiversity conservation and related issues among state and private sector personnel whose official duties were linked with the use or conservation of biodiversity, or had an indirect impact on biodiversity. The project also provided awareness about Sri Lanka's biodiversity to journalists who cover environmental issues.

The project was successful at the time, although several important lessons for improvement of future projects emerged through the continuous evaluation which was part of the project. Although this project served to provide knowledge and create an interest on biodiversity related topics among mid-level professionals and media personnel, there have been no similar project since then.

● **The Environmental Pioneer Programme (EPP)**

The Environmental Pioneer Brigade was initiated in 1984, as a programme involving school children, for a group of 60 children in Maligawatte, by the CEA. Currently there are over 6000 participating schools island wide and schools may register with the CEA for participation in this programme. Students from Year 6 upwards are eligible to join.

The CEA, in the role as the organizer of the EP Programme, provides some support for this scheme through both the head office and the regional offices by awarding modest grants for environmental activities, and helps with the organization of environmental activities among the schools taking part in the programme. The CEA also provides advisory services and assessment of progress.

The ADB funded Forest Resources Management Project has carried out an Independent Impact Assessment of the Environmental Pioneer programme of the CEA, and based on these, funds have been provided to add value to the programme in terms of its stated objectives.

● **University education for Biodiversity Conservation and management**

There are several environment related courses at postgraduate level initiated by the Universities of Colombo, Moratuwa, Peradeniya, Sri Jayewardenepura and Kelaniya and at the Open University which promote building skills for biodiversity conservation. Some of these courses are conducted through postgraduate institutes affiliated to national universities, such as the Postgraduate Institutes of Science of Universities of Peradeniya and Colombo, and the Postgraduate Institute of Agriculture of the Peradeniya University. In addition, several universities provide forestry related training. Notably the Department of Forestry and Environmental Sciences of the University of Sri Jayewardenepura offers a M.Sc. degree in Forestry and Environmental Management, as well as M. Phil and Ph.D. degrees in forestry through research.

The course on Biodiversity Conservation and Management for post graduate diploma students (i.e. environmental professionals of the CEA) funded through the World Bank/EA1P project included a wide range of lessons for a better understanding of global and national biodiversity, uses of biodiversity, threats to biodiversity, conservation approaches, biodiversity management and sustainable use (including environmental communication and eco-tourism) and a basic introduction to the Convention on biological diversity and other related conventions and major international efforts that benefit biodiversity conservation. A parallel course on Environmental Policy Planning for the same group covered policies for general environment, forestry and biodiversity conservation and management

4.2.9 Promoting biodiversity research

There are many institutional initiatives in the country, mainly through universities and research institutions for capacity enhancement in this sphere. Chief among them are the research grant schemes of the National Science Foundation to support Capacity building in research and development. Overall there is adequate capability in the universities for field level biodiversity research, and most senior researchers are able to access funds, either nationally or from external donors. However, funding for research which is crucial for *in-situ* and *ex-stu* conservation of threatened species is inadequate. This is a serious constraint to fulfil obligations under Article 9, particularly in respect of threatened vertebrate fauna.

The NSF promotes research by contributing to capacity development by way of training research students and supplying equipment to institutions undertaking biodiversity related research through its committees on agriculture, biotechnology, health sciences, social sciences and environment. The national Committee on the Man and the Biosphere, and committees on Environment and Biodiversity, and the thematic committee on Environmental Protection and Sustainable Development also focus on research on aspects concerned with biodiversity conservation and management. The NSF also promoted research on biodiversity related topics cover taxonomic studies, study of medicinal and therapeutic plants, diversity among various categories of plants and animals, structure and floristic composition of natural forests, establishment of national reference collections and databases, and biodiversity surveys and biological control of mosquitoes through fungal materials. The NSF also promotes research on genetic diversity amongst various taxa and characterisation of economically important species. Research grants have also been provided for screening species for biologically active compounds, pharmacological chemical studies and screening of species for pollution control.

Chapter 5

Thematic assessment - priority issues for capacity building

5.1 Reaching sectoral and cross-sectoral support for effective national planning and coordination to mainstream biodiversity conservation and sustainable use in accordance with the ecosystem approach

Addressing Article 6(a) on the development of national strategies, plans or programmes for the conservation and sustainable use of biological diversity and Article 6(b) on integrating conservation and sustainable use of biological diversity into sectoral/cross sectoral plans, programmes and policies.

- ***Inadequate support for reaching sectoral and cross-sectoral support is an issue for meeting national obligations under all three Rio Conventions. Adopting the ecosystem approach will also have a synergistic impact on all three conventions.***

BOX 5.1

Cross-sectoral Support for biodiversity conservation

The Conference of Parties to the CBD (COP 2) calls for Parties to (a) develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity, and to (b) integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies.

This concept is reiterated in the "Ecosystem Approach" which the CBD COP has decided should be the primary framework of action for Parties to be taken under the CBD. According to the definition by CBD COP, the 'Ecosystem Approach' is in essence a generic strategy for integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable manner. The ecosystem approach stresses on the need for 'societal choice' for biodiversity conservation and the participation of all sectors of society in the conservation and management of biodiversity.

The capacity assessment for this priority area particularly focused on (a) what capacities exist at present, and the capacities further required within and outside the institutions and agencies that have a major responsibility for the varied aspects of biodiversity conservation, to obtain the support of other institutions for preparation and implementation of biodiversity related policies, plans and programmes; and (b) the capacity status and needs to integrate biodiversity concerns into the plans and programmes of other state agencies (that have an impact on or use of biodiversity) and the business sector.

The capacity assessment is largely based on a roundtable meeting on obtaining cross-sectoral support for biodiversity conservation: adopting the ecosystem approach, discussions with high level administrators during institutional visits and discussions with communities, NGOs, the business community and other members of the public. Reaching sectoral and cross-sectoral support for biodiversity conservation and sustainable use through effective national planning and coordination in accordance with the ecosystem approach has been looked at in terms of four critical problem areas (5.1.1-5.1.4) during this study and are addressed separately in detail.

● Present status:

Biodiversity loss in Sri Lanka is exacerbated by the absence of a functioning¹ integrated policy for conservation and management of natural resources which governs the public sector institutions directly responsible for such action as well as other users and impactors. In recent years, however, the importance of integrating biodiversity conservation into sectoral and cross-sectoral plans has been acknowledged, and several measures have been instigated. Among the major efforts are: the creation of the Ministry of Environment (MOE) to formulate and coordinate all policy matters related to environmental conservation in 1990. The main environmental related policies are given in Chapter 2. With regard to biodiversity, the Biodiversity Secretariat (BDS) of the MOE prepared the national Biodiversity Conservation Action Plan (BCAP) with technical support from IUCN - the World Conservation Union and USAID. This document which gives specific recommendations within a broad framework of actions to conserve and sustainably manage biodiversity was published in 1999 (details of which are given in Chapter 2 and in the baseline survey report). The preparation of an addendum to the BCAP was initiated by the BDS through the PAM&WC project (see details in chapter 4 and in the baseline survey report). Despite these initiatives, there is inadequate capacity in the country to: (a) integrate conservation and sustainable use of biological diversity into sectoral (i.e. especially those of development agencies) and cross-sectoral plans, programmes and policies, and (b) prepare and implement biodiversity plans and policies with the required cross-sectoral support. A detailed situation analysis is given in Annex 5.1.

¹ Although many environmental related policies and plans exist, they lack support from all sectors as a 'functioning' policy.

5.1.1 Capacity required to finalise and implement plans and policies for conserving and managing biodiversity with adequate sectoral and cross-sectoral support*

There is overlap of problems under 5.1.1 and 5.1.2. However 5.1.1 looks specifically at the impediments faced by agencies with high responsibility for biodiversity conservation when they have to prepare and implement biodiversity conservation plans and programmes with the support of many other agencies. Hence, 5.1.1 focuses specifically on the problem of not getting adequate cross-sectoral support and commitment for preparation and implementation of plans, policies and programmes for biodiversity conservation and management.

Table 5.1: Barriers to obtaining sectoral and cross-sectoral support for biodiversity plan preparation and implementation

Systemic	Institutional	Individual
Most plans concentrate less on operational programmes and go into extreme details on the status of the resource (which are often outdated by the time biodiversity plans are approved for implementation). Many 'master plans' concentrate on giving detailed recommendations than on giving broad actions areas which have to be addressed by other implementing agencies. This, coupled with lack of adequate coordination and monitoring mechanisms leads to non-compliance by agencies identified for implementation. There is inadequate communication and coordination between the agencies responsible for environmental conservation and agencies in non-conservation sectors.*# Biodiversity/environmental plans and policies are rarely disseminated/communicated effectively by conservation agencies through well planned communication strategies to other stakeholders.	Institutions have low capacity for <u>effective</u> stakeholder consultation (though this is done on a routine basis) during biodiversity conservation planning. This precludes achieving stakeholder commitment for operationalising the plans. Most consultations are cursory, and perceived as a 'requirement'; but the agenda is already set. Further, mid level staff sent to represent state agencies at consultative meetings cannot make major commitments. Consequently there is no ownership of biodiversity plans and policies among the various stakeholders. The consultative processes used by institutions for biodiversity conservation planning fail to obtain stakeholder commitment for implementation when high level officials, civil society and key NGOs are not involved in the planning process. This is also partly due to the long time lapses between plan preparation and implementation, so that participants who attend the consultations are no longer	Individuals in agencies with responsibility for biodiversity conservation need skills strengthening for preparation of policies, strategies, action plans and other types of biodiversity related plans. Many individuals have inadequate understanding of what is required of a policy, a management plan, a strategy and the various types of action plans that are required depending on the objectives. <i>(The individual skills required include: conceptualising the main objectives and outcomes of the work at hand, guiding people who have to provide inputs -by providing an outline of the plan or policy so that they can contribute meaningfully, managing the consultative processes for maximum inputs and stakeholder ownership, and organising and managing the planning process.</i> <i>There are a very few people with the required skills in the country, but they are not always used (or are not available) for optimum benefit.</i> Advisory and expert committees often do not participate in the planning and implementation processes.

* Sectors are those in economic sectors defined in the 2004 Central Bank Report.

Systemic	Institutional	Individual
There is : • poor inter- sectoral (and sometimes even intra-sectoral) cooperation to carry out economically feasible and environmentally friendly conservation approaches in accordance with the ecosystem approach.* • lack of political will to support conservation sector agencies prepare, finalise and implement plans for biodiversity conservation and sustainable use.* • a wide gap between institutional policy and on the ground actions which is contrary to the ecosystem approach (this is due to lack of support from policy makers and development sector agencies).*	there in the institutions they represented at the time of plan/policy implementation. The present inter-institutional coordination by the BDS and other conservation oriented state agencies (FD, DWLC, CCD, CEA, etc.) is not sufficiently effective to obtain commitment from other agencies required for policy/plan/programme implementation. Most agencies concerned with biodiversity conservation have inadequate technical skills and funds to adopt the ecosystem approach (i.e. for social mobilisation) for biodiversity management. This precludes adopting adaptive management and techniques that blend local approaches with scientific and global knowledge.	Extension and technical staff of conservation oriented agencies lack skills for strategic communication to consult about, and communicate, biodiversity related plans, policies and laws.* Officials in development agencies (i.e. those in non-conservation oriented agencies such as irrigation and mining engineers, BOI officials, tourism planners, etc.) have poor knowledge of the technical aspects governing biodiversity issues and environmental laws and policies. Hence they cannot contribute positively for implementation of biodiversity plans and policies. <i>(overlaps with problem in 5.1.2)</i> High level policy makers override scientifically prepared plans and policies and existing mechanisms (e.g. sustainable use, quarantine procedures, sand mining, EIA procedures, etc.) due to lack of awareness of the needs for these procedures and the serious implications of contravening them for economic development and poverty alleviation.* <i>(overlaps with problem in 5.1.2)</i>

* From the Roundtable Meeting on 'Obtaining Cross-sectoral Support for Biodiversity Conservation: Adopting the Ecosystem Approach'

5.1.2: Capacity required to integrate (mainstream) biodiversity concerns into sectoral and cross-sectoral plans, programmes and policies of public service institutions.

Item 5.1.2 looks specifically at the barriers that preclude non-conservation sector agencies including biodiversity considerations and conservation responsibilities into their corporate plans and programmes.

Table 5.2: Barriers to integrating biodiversity conservation into cross-sectoral plans, programmes and policies*

Systemic	Institutional	Individual
There is: - poor awareness and understanding among non-conservation sectors* (including both state agencies and private sector industries) about (a) the BCAP, CFE, and other environmental plans and policies, and (b) about institutional commitments required to implement these plans. Local Authorities and Provincial and regional bodies are particularly unaware of the existence of national level biodiversity (and even more general environmental) plans and policies.[#] - poor perception and knowledge of the vital links between biodiversity conservation and sustainable use with national development, or about the economic impacts of biodiversity loss*	There is no proper institutional or coordinating mechanism for the BDS to disseminate biodiversity recommendations in the BCAP/Addendum and the CBD COP decisions and to ensure that they are incorporated into the plans of other institutions and sectors. (This includes integration of BCAP/Addendum/COP actions into other plans with environmental/biodiversity management objectives (e.g. coast conservation management plan, national agricultural plans, etc). <i>Note: The incorporations that have occurred (e.g. CZMP of 2004, agriculture research plan) are mainly due to the fact that the compilers of these plans were also involved in formulating the BCAP.</i> Development sector agencies do not give adequate attention to conditions that threaten biodiversity when preparing and carrying out their plans and programmes. <i>(specifically mentioned examples were CEB, GSMB, Department of Irrigation, Gems and Jewellery Authority, Ministry dealing with Tourism, and the Tourist Board).</i>*	High level officials in development agencies (i.e. non-conservation oriented agencies) lack knowledge on technical aspects governing biodiversity issues and environmental laws and policies. (e.g. energy, irrigation and mining engineers, geologists, financial planners, BOI officials, tourism planners, etc.) to include biodiversity considerations into their plans and programmes.* Planners (in planning units) in development sector agencies who prepare institutional and sectoral plans, policies and projects do not sufficiently understand or know about biodiversity/environmental considerations.* Technical staff in most non-conservation development sector agencies do not have academic qualifications with a biological background to fully understand biodiversity conservation needs and the importance of incorporating biodiversity requirements into sectoral plans and projects.* Policy makers lack the ability to promote the ecosystem approach due to inadequate technical knowledge about the scope of biodiversity and conservation needs and issues.*

Systemic	Institutional	Individual
		Most policy makers at the highest levels (including politicians) are often unaware of biodiversity issues and conservation needs. They need to be provided with knowledge on: (a) the impacts of biodiversity loss (through unsustainable use, habitat loss, threats from invasive species and GMOs, etc.) on the national economy, and (b) the importance of biodiversity for national development and poverty alleviation.* <i>[suggested: A mobile communication unit should be set up in the BDS to be used for awareness creation as part of an overall capacity building communication plan]</i>
There are deficiencies in the NEA for EIA procedures for development activities to cover biodiversity considerations adequately. Further, Biodiversity Impact Assessments (BIAs) are not mandatory in the current EIA procedures.	There is no biodiversity database in a central institution or identified institutions to refer during the EIA process to discern whether there is significant loss of biodiversity in an area earmarked to undergo development (<i>addressed under information exchange, section 5.5</i>). Few institutions and NGOs are capable of a valid environmental impact assessment and evaluation of EIAs. Hence the CEA or PAAs have a very limited group of experts (less than 25) to carryout EIAs and for evaluation of EIAs.	There are very few trained people in the country to carry out BIAs if they became mandatory.* There have been no recent training initiatives in EIAs within the CEA and among environmental NGOs.

* From the Roundtable Meeting on Obtaining Cross-sectoral Support for Biodiversity Conservation: Adopting the Ecosystem Approach.

5.1.3: Capacity required to address inadequate national budgetary allocations for biodiversity conservation

There are several organizations in the state sector with mandates and major responsibilities to fulfil national obligations under the CBD. They are often constrained due to inadequate national budgetary allocations. Often (but not only) due to funding limitations these institutions are able to carry out only some aspects of their mandate for biodiversity conservation. These state agencies consequently depend heavily on external project funding. Such activities come to an abrupt halt after the projects cease due to lack of institutional funding from the national budget, and are not sustained in the long-term.

Currently, the Ministry dealing with Plan Implementation collates the annual plans and budgets proposals sent by planning cells in line ministries (based on the proposals sent to them by state agencies under the purview of these ministries). The Department of National Planning and the budget division of the Treasury have the power to veto and determine the actual allocation of funds to the various agencies.

Table 5.3: Barriers that result in inadequate funding for biodiversity conservation and sustainable use

Systemic	Institutional	Individual
There is poor perception of the economic importance/value of <i>in-situ</i> and <i>ex-situ</i> conservation of biodiversity in the agencies concerned with (a) budget planning and allocation, and (b) national development. There is little understanding in the financial and national planning institutions that biodiversity underlies economic development (e.g. biodiversity is perceived mainly in terms of parks and protected areas (for tourism) and species that require conservation, but not as a vital component of fishery, agriculture, industry, etc.). There is inadequate transparency about how budgetary allocations are made for state agencies with responsibility for biodiversity.	Agencies allocating national funding are not familiar or conversant with what the conservation agencies seek to achieve and why, and how meeting these objectives are vital for national development and poverty alleviation. In addition, organisations that are not directly responsible for conservation, but play a major role in using and 'impacting' on biodiversity, also do not allocate adequate financial resources through their institutional budgets to address biodiversity considerations. Hence biodiversity considerations are not well represented in their corporate plans and programmes. Cuts in budgetary allocations are made by financial sector agencies when institutional plans are of a low standard, and indicate insufficient understanding of capacity and resources (other	There is poor awareness about environmental/ biodiversity issues, and their relevance for national development and poverty alleviation among officials of the ministry and Department of National Planning (DNP) or the Treasury. <i>[suggested: the mobile communication unit set up in the MOE/ BDS for awareness creation could target these officials. Also assistance should be given to the relevant state organisations dealing with in-situ and ex-situ organisations to make effective presentations about their work to the Treasury and DNP].</i> Most programme and budget planners in planning cells of conservation sector agencies and the relevant ministries lack adequate capacity to present programme proposals/plans and budgets that are feasible and attractive to increase

² Note: However, 25% of earning from the BGs is set aside for the Botanic Gardens Trust Fund.

Systemic	Institutional	Individual
There has been inadequate funding for environmental activities in the past, partly because the subject of environment was considered a sub-sector under agriculture. The idea of biodiversity valuation is not widely prevalent and has made little headway towards integration into the national economy since the BCAP (1999). Given the inadequate understanding and conceptualisation of the importance of biodiversity for the national economy, there is little scope as yet for providing financial incentives such as tax rebates and eliminating perverse incentives (e.g. chemical fertiliser subsidies) at the national level to promote biodiversity conservation.	than financial) for project completion. This is compounded by poor communication of the needs for enhanced budgetary allocations by agencies responsible for conservation. <i>(State sector environmental agencies claim, however, that this is not always the case and that proposals sent by line agencies are not even considered as the relevant budgetary decisions have already been made).</i> The income generated by some agencies responsible for biodiversity conservation are not released back to them (adequately) for institutional development². e.g.: (1) FD depends on external funding for 60-70% of their programmes, but could become considerably independent if at least the funds from timber supplied to the State Timber Corporation are channelled back to the FD. Given the paucity of national funding available for biodiversity conservation and management, some conservation agencies also lack capacity to access external funding to meet their mandates for biodiversity conservation. Others lack capacity to maximise the funds provided. This has a spin off effect. Poor performance reduces further chances of securing donor funding, and also necessitates repeatedly seeking more funds to achieve the same long-term conservation goals. Several institutions receiving foreign funds lack the capacity to monitor and evaluate the technical assistance received. This is compounded when members of technical evaluation committees lack capacity, or have no time, for in-depth evaluation. This precludes maximum use of external funds received.	institutional budgetary allocations by the Treasury. [suggested: skills building among staff for planning and preparation of budgets, communication and resource management] Administrators in conservation sector public agencies lack adequate negotiation skills to leverage for more funds for biodiversity conservation from policy makers and financial planners. [suggested: Institutional skills building for marketing, negotiation and communication] Individuals in state sector agencies responsible for biodiversity conservation lack capacity for: • log-frame analysis, SWOT analysis, preparation of concept papers and full project proposals. • project management to optimise benefits from donor funded projects (Projects also often falter due to weak internal communication). Individuals within institutions responsible for <i>in-situ</i> and <i>ex-situ</i> conservation need capacity and mechanism to use the best possible combination of local and external consultants for biodiversity projects funded by the ADB and WB - rather than relaying entirely on a bidding system as done now.

● Overall priority capacity building needs to address 5.1.1 -5.1.3 and possible interventions

- Building political will and support for biodiversity conservation and sustainable use. If not, all dialogue and programmes in this connection will not be of any avail.
- Promoting an overall holistic approach to national planning and budgeting which addresses biodiversity (and other environmental) issues and valuation. The prevalent situation is *ad hoc*, and changes frequently with government changes.³
- Building greater awareness about the importance of biodiversity conservation for national development and poverty eradication, and creating greater commitment for conservation, among public service institutions concerned with economic, social and infrastructure development.
- Instilling skills and coordination in agencies responsible for *in-situ* and *ex-situ* conservation for communication, education and public awareness to better market their activities to financial and development sector organisations and funding agencies
- Building skills for project proposal and budget preparation (i.e. to access both national and donor funding).
- Establishing a mechanism to promote accountability among all levels of stakeholders responsible for biodiversity conservation, including institutions with major impacts on biodiversity.

Possible interventions:

- **A National biodiversity (or environmental) communication initiative**
There is inadequate capacity in the BDS/MOE to conduct a well planned communication initiative that targets the critically important institutions and stakeholder groups having significant impacts on biodiversity (including policy makers and planners at the highest level), to obtain their support for biodiversity conservation and sustainable use.

Capacity building in the MOE/BDS to formulate and implement a national biodiversity communication initiative (based on a well planned communication strategy) that can

- (a) target high level policy makers, planners and administrators (at central and regional levels) in selected important development sector agencies that impact on or rely on heavy use of components of biodiversity; and the business sector; and
- (b) build capacity in state agencies responsible for biodiversity conservation (FD, DWLC, DOA, CCD, DFAR, NZG and NBG) and selected NGOs for effective communication through training of trainers initiatives and product development (corporate presentations, etc).

As part of this initiative, the BDS/MOE could have a mobile unit, help build communication planning and implementation skills and prepare materials/products (PowerPoint presentations, slide packs, etc.). **[Note: Instituting a programme of Information, Education and Communication (IEC) to improve awareness of the issues in the fisheries sector has been created through the CRMP for the fisheries sector. This facility is not limited to educate the fishermen, but is also meant to provide information to officials and politicians].**

Such an initiative should also target⁴:

- **Customised communication for politicians:**
As a part of the overall communication initiative, a continuous, pragmatic and customised communication approach in the development 'language' familiar to this target group should be used to inform the target group of: (a) current plans and approaches to biodiversity

³ India has a Standing Committee on Science and Technology, Environment and Forest and which is publicized in the media. Environmental issues can be brought to the notice of these committees by interested parties (source: Roundtable).

⁴ Such an initiative should NOT consist of individual lectures from invited speakers, but should be a well planned initiative with well prepared and pilot tested support material such as customised audio-visual and printed material. When targeting non-scientists, the material should be designed to give out scientific facts in a simplified understandable form.

conservation and why they are important for national development, (b) economic potential of biodiversity through sustainable use (c) threats to biodiversity and their adverse impacts on the national economy, and (c) links between biodiversity conservation and sustainable use and poverty alleviation. The communication initiative should not be aimed at creating awareness only but should aim at building ownership and commitment for biodiversity conservation. The programme should be made attractive for participation. For example, the target group could be offered communication training. As a part of this initiative, **bio-economic modelling should be explained** to (a) policy makers to make them more interested in conservation and sustainable use, and (b) to economists who may not understand the social costs.

[Suggested responsibility for such an initiative: BDS - with support from NSF, EFL (on legal issues), and other relevant individual experts on communication planning]

- **Customised communication targeting development agencies and the private sector:**
As part of the overall communication initiative, the BDS/MOE should establish a mobile unit that could support communication, education and public awareness (as a part of the overall communication initiative) to promote adherence to overall environmental policy that promotes biodiversity conservation and to promote specific biodiversity conservation needs. This unit could periodically visit state institutions/chambers of commerce/media institutions for short but well planned briefing sessions. **To be of any use**, this unit should be part of a broader strategic plan which offers customised and high quality communication to critical target groups.
- **Skills building in communication and education divisions of agencies responsible for conservation** to strategise consultative processes for biodiversity planning via a strategic communication approach that is part of the entire planning process and implementation and for reaching cross-sectoral support. *(i.e. Overall consultative processes should be carried out in a manner that is innovative and specifically targeted towards obtaining cross-sectoral commitment and high level support for preparation and implementation of national biodiversity plans and programmes. It should be well planned to achieve defined goals rather than merely as a requirement in the policy formulation process.*
- **Skills building among professionals** (State sector organisations and NGOs) to effectively present technical facts substantiated by valid reasons for institutional decisions to politicians and for negotiation and advocacy. *This would help politicians and other key policy makers make decisions based on scientific facts).*
[suggested responsibility: BDS - with support from NSF/MAB, environmental communication planning and legal experts, relevant NGOs and the media].
- **Skills building for negotiation and advocacy among agencies responsible for conservation.**
[suggested: A major communications initiative for the EE&GAD and BDS/MOE - in collaboration with NSF/MAB, individual local and expatriate environmental communication experts to carry out training in communication, education and public awareness and negotiation and advocacy. This should target policy makers, state development agencies, state conservation agencies and key environmental NGOs. The MOE/ BDS could benefit from the ongoing Communication and Education Awareness initiative for the CBD. GEF funds could be sought for a major multi-institutional capacity building initiative for communication, education and public awareness on biodiversity].
- **Re-establish the mid-professional level biodiversity networks for mainstreaming biodiversity conservation)**
The BDS/MOE should establish biodiversity units/cells in key agencies involved in financial and national planning and those that use or have adverse impacts on biodiversity, or are involved in law enforcement (these institutions have been identified in the strategy prepared for preparation of the BCAP by the MOE). A network of biodiversity focal points in these biodiversity cells together with focal points in the agencies that are instrumental in conserving biodiversity should be formed. The biodiversity cells should be manned by personnel with environmental/biodiversity knowledge and capability to communicate their concerns to the institution as a whole (based on good communication skills).

[suggested: BDS to carry out periodic and continuous training through an institutionalised and well planned process (similar to the Biodiversity Skills Enhancement Project) via the OUI/Environment Division as done through the EALP project. However, the training should not be given in a purely academic manner, and there should be field components to the training. The resource materials should be specially prepared (including audio-visual material, printed and online material) and should not consist of photocopied scientific texts].

Lesson: The ministry of environment established and maintained a network of Biodiversity Liaison Officers in all stakeholder ministries, departments and agencies to facilitate the preparation of the BCAP during the mid 1990s. Through this network, as well as regular consultation with network members, the ministry kept stakeholder agencies interested in the BCAP process. In addition, the ministry conducted a series of awareness programmes for state officials at various levels, commencing with the Secretaries of Ministries.

● **Enhance capacity for biodiversity valuation, bio-economic modelling and providing incentives to promote conservation**

At institutional and individual level create the climate and skills for inclusion of biodiversity valuation and incentives into national planning by building understanding of the importance of conserving and managing biodiversity among the top financial planners and managers; build skills among national planning agencies for biodiversity valuation; and include biodiversity valuation at the degree and post graduate degree curricula.

● **Capacity building needs for the BDS to obtain sectoral and cross-sectoral support for implementing national biodiversity plans and strategies.**

The BCAP, prepared in fulfilment of **Article 6(a)** of the CBD, has to be implemented by a large number of state institutions, the business sector, NGOs, media and local communities. Many recommendations in the BCAP need sectoral and cross-sectoral initiatives. While many recommendations in the BCAP have been implemented by various institutions as part of their institutional programmes, the Plan itself has not been implemented, and the actions monitored in a holistic manner as yet. It is increasingly clear that addressing the complex and multi-faceted requirements of biodiversity conservation in the country cannot be done through isolated or ad hoc activities by various institutions. Nor can all the required actions be carried out by one institution or the BDS in view of the fact that biodiversity considerations have to be integrated into all sectoral and cross-sectoral plans and programmes at the national and regional levels (**Article 6(b)**).

The National Environmental Action Plan termed 'Caring for the Environment 2003 -2007: the path to sustainable development' recommends that in view of the rich biodiversity of the country and high endemism among the species under threat, "the implementation of the BCAP in its totality is absolutely vital" (page 120). It further states that the BCAP should be treated as a master plan and that the BDS together with other stakeholder institutions should draw up implementation programmes to make the recommendations operational. The CFE correctly identifies that the BCAP is called a "framework for action" because it sets out recommendations for action but leaves out the operational details, such as funds and institutional mechanisms as they have to be worked out in the manner stated above. This was a conclusion reached during the BCAP preparation as it was expected that this would be part of BCAP implementation (as done for the UK BAP). While the addendum has reviewed the BCAP and incorporated some recommendations to address issues that have come up since its publication, it does not aspire to give operational guidance required for an implementation programme for all the recommendations as this would be practically impossible. As much of the activities have to be addressed through other agencies, an efficient tracking mechanism is vital. Hence this task remains to be carried out by the BDS. However, the mechanism to be adopted by the BDS to implement the BCAP in its totality has been identified by Task Force 11 for preparation of the Addendum (see figure below).

The Biodiversity Division (or BDS) has to set in motion the required organisational arrangements (e.g. Steering Committees, Expert Groups, Task Forces, Working Groups, professional networks, etc.). It

also has to provide technical support and expertise (where relevant) to the many institutions and organisations that have to implement the BCAP recommendations.

If the BDS is to realistically achieve this, considerable capacity building of the Biodiversity Division of the MOE and networking is required to: (a) initiate the necessary activities and co-ordination mechanisms to ensure that individual recommendations are implemented by the relevant institutions that have responsibility to do; (b) carry out the facilitation, co-ordination, monitoring and evaluation activities for this process; and (c) implement actions that are the direct responsibility of the BDS. Such capacity does not exist currently in the BDS.

Possible Interventions:

- Establish an effective coordinating mechanisms to facilitate implementing the BCAP

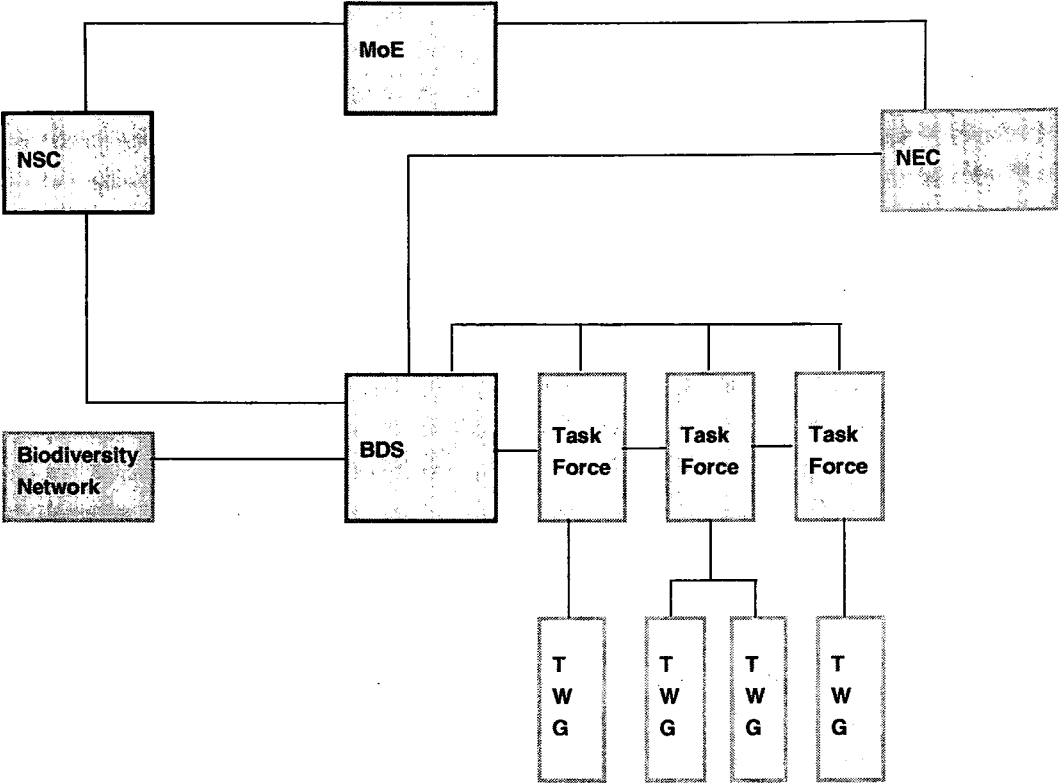
Table 5.4: Points of intervention for capacity building in the BDS

Level at which capacity is required	Status
Systemic	It is necessary to build an efficient mechanism to assist the BDS coordinate the various activities of different departments, NGOs, communities, the business sector, etc., as recommended in the BCAP. This is a priority requirement for fulfilling national obligations under the CBD. This mechanism should be apart from the CEPOM structure which has been in effect established to monitor and support the implementation of the NEAP.⁵ A mechanism to ensure strong representation of Sri Lanka at CBD/COP meetings is vital. Such a mechanism would help (a) obtain prior national consensus on Sri Lanka's position for contentious issues to be addressed at the COP, and (b) facilitate debriefing by the representative at the COP more widely to the relevant stakeholder groups. This will also serve to use the capacity building side events associated with COP to full advantage by Sri Lanka in order to build technical capacity for biodiversity conservation. <i>[suggested: NSF/ILD could assist this process as a part of their institutional programme if requested by MOE].</i>
Institutional	A detailed institutional review of the BDS is required taking into consideration the specific recommendations of the BCAP, TF 11 of the Addendum, requirements for servicing the biosafety protocol, and the actions identified through the NCSA. The capacity gaps could be addressed fully only after this. The capacity needs assessment carried out through the NCSA should be used as the basis for this review. This could be addressed by the ongoing institutional review. Capacity should be built in the BDS to: • Operationalise the BCAP. This should be done by establishing an effective coordinating and monitoring skills mechanism to coordinate implementation of the BCAP in its totality as recommended by the NEAP and suggested by TF 11 (Fig.5.1 to 5.3). • Promote the clearing house mechanism and disseminate the outcomes of CBD COP meetings to promote technical and scientific cooperation under Article 18 and for dissemination of information on: ○ The CBD/COP recommendations, ○ Capacity building initiatives available for country parties via the CBD.

⁵ (note: The issue of networking for biodiversity conservation was addressed by the then Ministry of Environment, Transport, Environment and Women's Affairs (M/TEWA)) by creating a Co-ordinating Group for the Conservation of Biological Diversity (CGCBD) in 1992. This was an inter-ministerial body, with additional representation from outside the government sector, including NGOs. M/TEWA also set up a network of focal people (mid level professionals in government departments) to facilitate implementation of the Biodiversity Convention and to promote an integrated approach to the preparation of the BCAP. There was also an environmental group under the purview of the Ministry of Finance, Planning and National Integration to ensure consideration of environmental issues in the national planning process. These coordinating mechanisms are not functioning at the moment).

	Especially important are country participation at the side events held in connection with the CBD. [Suggested: possibility for linkage with NSF/ILD to assist the BDS in this regard should be explored by the MOE at no additional cost]. The BDS has also been identified through the NCSA as the institution that should set up several mechanisms and networks. These include a focal point to facilitate access to genetic resources and benefit sharing (an ABS regime); a mobile unit for communication, education and public awareness; facilitate the clearing house mechanism; a meta-database on biodiversity; carry out the vital functions of co-ordination, monitoring and evaluation to implement the BCAP. This requires considerable capacity strengthening within the BDS in terms of equipment (IT facilities and multimedia), trained staff, expertise and funds.
Networks and coordination mechanisms	It is doubtful whether filling the Assistant Director cadre within the BDS will better equip the BDS for the large number of tasks it has to carry out. Funding and other constraints may well preclude building the necessary staff capacity within the BDS. As government salary levels are less than in the private sector, it may be difficult to get more highly skilled staff at the junior and mid levels to supplement the expertise in the division. The expertise in the NEC may not also cover all fields required for implementing the provisions of the CBD and BCAP. The secretariat should establish (a) expert networks that can be called upon to provide advice in relevant fields (i.e. legal, species, management, report writing, communication, expertise on the CBD, etc), and (b) formal partnerships with other state organisations and NGOs with the required capacity and similar interests. Setting up of a list serve of expertise and servicing this could be a first step in enhancing the capacity of the BDS. The new structure for the BDS (recommended through the ongoing review) should take into account that <i>expertise could be built, in the absence of additional funding, by forming advisory networks and institutional partnerships to support the available expertise among the very few senior staff in the Division.</i> It is important to re-formulate the network of mid-level professionals in all key agencies concerned with biodiversity conservation and agencies that use and impact on biodiversity is a priority need. The BDS together with other partner institutions [suggested: NSF&MAB/OU Environmental Division] could provide periodic training on current biodiversity management approaches and issues. NGOs such as WLNPS and EFL could provide inputs to the training programmes. This network can be used to help track and assess institutional actions for implementing the BCAP, and thereby help facilitate cross-sectoral coordination.
Individual	Overall capacity building among individuals is required to conceptualise CBD requirements, facilitate and monitor BCAP implementation and capacity for inter-institutional and cross-sectoral coordination to address the BCAP recommendations. Intensive staff training is needed for the new recruits and mid to junior staff cadres (particularly those who will be promoted to AD positions) Training of junior staff to AD level: (a) Understanding the CBD (including a basic understanding of the legal position of the CBD and Articles 15 -1 7 and 19), (b) holding effective stakeholder consultations through participatory processes (i.e. holding more productive workshops, meetings, etc) and consensus building, (c) proposal and report writing, (d) communication planning and implementation of such plans, (e) setting up a meta-database, and web and list-serve management (this requires both scientific and IT skills), (f) project management and coordination and (g) English language skills (spoken and writing). Senior staff: Negotiation at CBD COP and advocacy skills are required.

FIG 5.1. INSTITUTIONAL STRUCTURE RECOMMENDED FOR IMPLEMENTING THE BCAP BY TASK FORCE 11

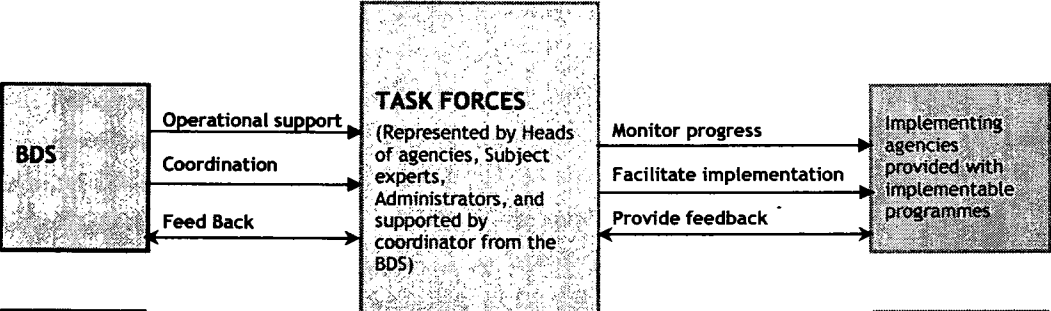


NSC=National Steering Committee, NEC= (National Experts Committee), BDS=Biodiversity Secretariat, TWG=Thematic Working Groups. Biodiversity network of mid professional level staff in BCAP stakeholder institutions.

Establishing Task Forces has been recommended in the BCAP, but certain modifications in the actions proposed for the Task Forces may be necessary to suit the current situation as stated below:

- Lead agencies required to carry out the individual recommendations of the BCAP should be represented as members of the relevant Task Forces. They will also be responsible for reporting back on progress of actions to be carried out by their respective institutions.
- Other institutions responsible for actions monitored by the Task Force will also have to report back to the Task Force.
- The Task Force should also monitor the progress of actions that fall within their purview so that there is peer review of action taken.
- Facilitate the implementation and organize assistance to the implementing agencies where required through the formation of Working Groups.

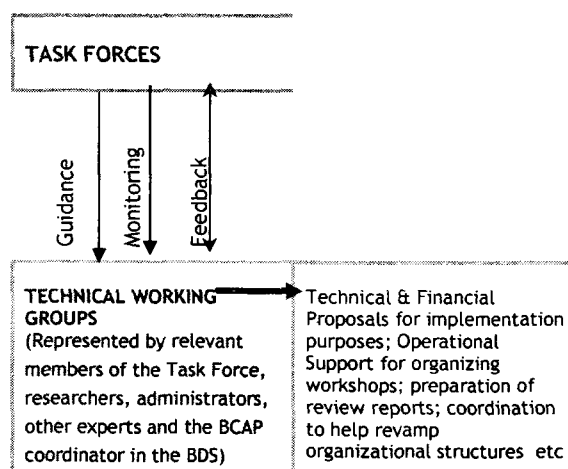
FIG 5.2. MAKING THE TASK FORCES OPERATIVE AS PROPOSED BY TASK FORCE 11



The number of Task Forces required, and the activity areas and membership to be covered by each should be identified through an adequately representative consultative process. The following have been suggested by Task Force 11 as possible themes for the proposed Task Forces.

- *In-situ* and *ex-situ* conservation of biodiversity
- **Research and information management** (including meta database development)
- **Legal issues** pertaining to strengthening sectoral laws, access, biosafety, alien invasive species, biodiversity and trade and foreign policy.
- **Access and biotechnology**: to deal with access issues, ethics, bio-technological development and bio-technology transfer (policy and actions of the area)
- **Communication, Education and Public Awareness** to promote the BCAP and biodiversity conservation among the different segments of Sri Lanka including policy makers, planners, heads of departments etc., and specifically to raise the profile of and funds allocated for biodiversity conservation within government by creating awareness of the BCAP and benefits of biodiversity conservation for national development among policy makers.
- **Integration and devolution**: Integrating biodiversity concerns into cross-sectoral issues, the private sector, NGO activities and community actions (chapter 7) and devolution of biodiversity conservation. (this could be divided into two if desired)
- **Policy Task Force** to critically examine impacts of all new cross-sectoral laws/policies/trade and access agreements and major development efforts on biodiversity conservation; guide formulation of new policies to address *in situ* conservation outside forests; integrate biodiversity concerns into land policy and wetland policy. (could be combined with the TF on legal issues)
- **Traditional knowledge** and cultural practices related to biodiversity conservation (should have representation from legal/policy Task Forces).

FIG 5.3: MAKING THE TECHNICAL WORKING GROUPS OPERATIVE TO ASSIST TASK FORCES



(Source: Task Force 11 for preparation of addendum for biodiversity conservation).

5.1.4: Capacity required to address inadequate business sector involvement in biodiversity conservation and sustainable use

● Present status:

There is now greater acceptance of the need for corporate responsibility with regard to biodiversity conservation than in the past, and greater acceptance among conservationists about corporate sector participation in biodiversity conservation. There is also increasing understanding that the businesses sector can contribute considerably toward conserving biodiversity in partnership with the state sector. Despite this, there is relatively little contribution from the business sector to promote biodiversity conservation and sustainable use. This is especially appropriate in the emerging opportunities for biotechnology using genetic resources and biosafety.

The BCAP too specifically addresses the role of the private sector under integrating national efforts for biodiversity conservation. It specifically states that “through dialogue and dissemination of information, the private sector should be made aware of the fact that biodiversity conservation should be a matter of concern to them and that contributing towards achieving conservation objectives is in their long-term interest. A policy framework has to be formulated to promote their [business sector] participation, for example by providing incentives for investment on conservation programmes”. . . , for ecotourism, bio-prospecting combined with *ex situ* conservation (including the use of tissue culture and captive breeding of commercially important threatened species), sustainable use of indigenous bioresources.

● Overall capacity building needs and possible interventions

Often, problems arise between the state agencies and NGOs concerned with biodiversity conservation and the business sector due to: (a) the lack of understanding among the business community about biodiversity conservation requirements (including the purpose of EIAs) and the ultimate benefits of biodiversity conservation and sustainable use for business development, and (b) the inability of conservation agencies and NGOs to communicate this message in an understandable form to the business community.

The main problems underlying inadequate involvement of the local business sector in biodiversity conservation are given in Table 5.5.

Table 5.5: Barriers to obtaining support of the private sector for biodiversity conservation and management from the roundtable on business and biodiversity

Issues	Cause of problem
Conceptualisation There is poor perception of the links between biodiversity conservation and its business potential among the business sector. Biodiversity is generally considered the realm of ‘scientists, government and conservationists’. However, the value of biodiversity for tourism is well understood; the value of biodiversity in the ornamental species trade is also understood. <i>[This could be addressed by MOE/NSF with expertise from NGOs such as EFL (on legal issues), professional bodies and civil society bodies (such as the Rotary Club)].</i>	There is poor communication between the government, business community and scientists regarding biodiversity issues. There is hardly any dialogue between the business and state sector⁶ about shared interests and possible collaboration for conservation interventions and sustainable use of bio-resources.
Use of genetic resources in biotechnology There is underutilisation of genetic resources by the local business community, while many valuable local herbs and other genetic resources are illegally taken out of the country by foreign pharmaceutical companies and patented elsewhere with no benefit to Sri Lanka. The local business sector is largely unaware of the exploitation of genetic resources by foreign companies. The ramifications of ‘bio piracy and bio theft’ are hardly known within the business sector, although this means loss of business potential in the future. Local companies also lack knowledge on IPR procedures, technology transfer and benefit sharing requirements in this sphere.	The business potential and industrial development opportunities in biotechnology using indigenous genetic resources and biosafety are poorly understood. This is partly due to inadequate communication between the business sector and the scientific community. <i>Biodiversity communication (see communication initiative above) should specifically target companies that are interested in biotechnology and biosafety as</i>

⁶ In this context the sectors are state and private sectors; the private sector comprises business, NGOs and CBOs.

Issues	Cause of problem
There are many over-looked opportunities within Sri Lanka for joint commercial ventures in biotechnology, based on genetic material and using sophisticated technology, for collaborative ventures between the business and state sectors (note: The BCAP recognises the role of the local private sector in bioprospecting).	<i>these have scope for local business but are poorly known.</i> <i>[This could be addressed by MOE/NSF /Ministry of Science and Technology through the chambers of commerce, with expertise from NGOs such as EFL (on legal issues), professional bodies and civil society bodies (such as the Rotary Club) to help with confidence building between the state and business sector].</i>
The implications of foreign patents on the use of local genetic resources and their derivatives are relevant for local companies venturing into biotechnology using genetic material (especially as some technology rich countries have not ratified the CBD because of concern over technology transfer provisions). There are adequate numbers and categories of trained people and sophisticated equipment in the country. However, despite availability of local experts capable of working on genetic resources for biotechnology development, the business sector brings in foreign experts for such work.	
Biosafety with regard to GM foods/organisms concerns human health; and regulations to control and regulate the importation of GM food to the country are pending. This holds potential for the business sector to enter the area of GM food testing. However, the local business sector is largely unaware of such opportunities and has poor understanding of the concepts related to biosafety. <i>(note: Sri Lanka does not require GM items at the moment, but they could always be produced locally if deemed necessary in the future).</i>	
Sri Lanka had vast potential for floriculture and vegetable seed production using biotechnology, and has potential to produce biofertilisers, bioherbicides, biogas, etc. using indigenous genetic resources.	
Local companies lack knowledge on IPR procedures, technology transfer and benefit sharing requirements in this sphere.	This aspect has not been given adequate attention by any state sector agency or the BDS. <i>[This should be addressed as part of the ABS regime before local companies enter into any collaborative partnerships with foreign companies in this regard].</i>
Local industrialists have problems of getting licenses for disseminating bio-products derived from biotechnology, while imported items are released with no such restrictions.	The state has no mechanism to assist local companies to obtain patents on their inventions using genetic resources. <i>[This should be part of the ABS regime].</i>

Issues	Cause of problem
Forestry Biodiversity being very much a corporate social responsibility, enriching forest plantations and reforesting degraded lands are possible areas for private sector/state sector/university collaboration. Government-private sector collaboration can be productive for restoration of forest habitats, whereby the private sector provides financial support and the government sector supplies the technical expertise. However, the business sector is concerned that any private sector involvement with forests are viewed with suspicion, and attributed to ulterior exploitative motives by conservation agencies. This precludes genuine interest and involvement by the business sector in forestry and conservation projects. Political factors and constant government change (and change of associated policies) are also a barrier to a productive state-business sector collaboration for biodiversity conservation. There can be government-private sector collaboration to help preserve, establish, maintain, and where possible sustainably use urban forests.	This situation is the result of 'exploiters' in the guise of industry. It is necessary to build trust between conservationists/conservation agencies and the business sector. <i>The private sector should also make a positive effort to win the confidence of the regulating institutions. This has been achieved by some companies.</i> <i>Tax rebates and incentives should be considered to better involve the private sector in conservation ventures.</i> <i>There should be greater communication and contact between the business sector and the forestry sector in terms of collaborative ventures for forest conservation.</i>
Multinational companies have entered into contracts with the state sector in ventures that may be damaging to the local timber resource and to the local wood based industries which provide considerable value addition to the timber.	There are no mechanisms for such problems to be brought to the notice of policy makers and to be addressed, to preserve local business interests as well as safeguard conservation aspects.
Aquarium trade There is an erroneous perception that regulations preclude transportation (including collection) of endangered species from the wild for captive breeding programmes. It is poorly known that the DWLC issues a special permit for persons interested in breeding these species to obtain specimen from the wild, breed them in their aquaria, enlarge the population, and then reintroduce them to the wild under the supervision of the DWLC. There should be better collaboration between scientists and conservationists (with technological know-how for captive breeding) and collectors (with knowledge on environmental conditions for individual species that are vital for reintroduction) to effectively promote captive breeding and reintroduction of threatened ornamental species.	There is inadequate awareness among collectors and breeders on sustainable use practices, state sector policies and laws. This aspect is being explored by the state sector for captive ornamental fish breeding, but is hampered by inadequate infrastructure in the state sector (e.g. NARA). The required technology and expertise is present at NARA and the NZG. There are some collaborative ventures between the National Herbarium and business on plant species (see below).
Tourism industry Corporate social responsibility for biodiversity conservation	There is poor knowledge of the

Issues	Cause of problem
is acknowledged in the tourism sector and there is overall understanding that: (1) tourism depends on biodiversity, and (2) tourism can be a tool for conservation. However, there is poor perception as yet of the biodiversity conservation requirements at policy, institutional and operational levels in the tourism sector. This is particularly acute at the higher level. There is inadequate perception of what is required for eco-tourism, so that various forms of nature based mass tourism are developed in the guise of ecotourism.	monetary 'value' of biodiversity conservation for tourism among top tourism managers. This should be enhanced by: • creating greater awareness about the economics of biodiversity conservation and tourism. • creating knowledge and skills for genuine ecotourism.
The rich biodiversity and cultural heritage of Sri Lanka offers vast potential to expand sustainable tourism by way of collaborative ventures between the private and government sectors which satisfies both conservation needs and economic development. This has not been fully explored as yet.	Little attention has been given to developing innovative and acceptable mechanisms for combining government and private sector interests to improve eco-friendly tourism (e.g. promoting eco-friendly tourism for small groups in little visited natural areas and cultural sites). However, such ventures have to be scientifically managed and supported with adequate checks to stop illegal extraction of material and artefacts from forest and archaeological reserves. Capacity is inadequate as yet for the required monitoring and surveillance.

Possible interventions:

- The BDS/MOE through a task force on integration should facilitate integrating biodiversity into the business sector corporate programmes and plans.
- A mechanism to bring together researchers, scientists, the local private sector and technology for using bio-resources should be established. Awareness should be created among the business community on biodiversity conservation needs and possible business opportunities for sustainable use of bio-resources via the chambers of commerce, professional associations and civil society organisations such as the Rotary Club. The Chambers of Commerce should be encouraged to bring about closer and productive links for the private - state sector cooperation to expand business opportunities for biodiversity conservation and sustainable use.

[suggested: MOE/BDS/ NSF could initiate a regular programme between public sector and private sector with the assistance of NSF/Ministry of Science and Technology and the Chambers of commerce; NSF through its various committees (e.g. biotechnology committee) could help apprise the business sector in this regard in collaboration with the BDS and chambers of commerce; the BDS could facilitate this process through TFs for implementing the BCAP and establish the required partnerships. NSF may require funds and technical advice to initiate such action].

- Awareness creation opportunities via the chambers of commerce, professional associations and civil society organisations (umbrella organisations) should reach out to all sectors of business, including SMEs and grassroots consumer groups. Such awareness' programmes should however be continuous and the media should be used to support this effort (*note: media has limited capacity to assist, and requires capacity building; media heads should be apprised of the news worthiness*

of this initiative and brought on board. While this could be carried out by NGOs, few have the required capacity to conduct a continuous programme of this nature).

- Tax concessions and other incentives could be provided to enhance private sector participation in sustainable use of biodiversity and for sponsoring biodiversity conservation oriented activities, such as awareness programmes, skills enhancement and mass media events.

[suggested: Should be addressed by setting up a TF on integration by the BDS for implementing the BCAP].

5.2 Reaching effective enforcement of laws and regulations to promote biodiversity conservation and sustainable use

- ***This is an issue for meeting national obligations under all three Rio Conventions..***

There are adequate environmental policies and laws to promote biodiversity conservation, but their enforcement remains unsatisfactory.

One of the reasons for poor law enforcement is the lack of support from the police, customs, etc. Overall, there are about 80 other laws enacted to conserve Sri Lanka's environment. Many of these are of direct relevance to conservation and sustainable use of biological diversity. The Fauna and Flora Protection Ordinance No. 2 of 1937 and its amendments, the Forest Ordinance No. 16 of 1907 and its amendments, The National Heritage Wilderness Area Act No. 3 of 1988, the Fisheries and Aquatic Resources No. No. 2 of 1996, the Coast Conservation Act No. 57 of 1981, and its amendment Act No.64 of 1988; and the Plant Protection Act No. 35 of 1999 are of particular relevance for the conservation and use of wild biodiversity. Table 5.6 identifies the barriers to law enforcement that preclude biodiversity conservation.

● **Overall capacity building needs and possible interventions**

Possible interventions:

- Training and awareness programmes are required for police officers to enhance their skills and knowledge on: (a) biodiversity related laws, (b) protected species, and (b) concepts of biodiversity conservation and sustainable use as relevant. This can be provided via the routine training programmes offered to police officers in the Police Department.

[Suggested: Support is required from experts for training on legal issues and biodiversity to assist the Police Department plan and to conduct regular training courses in this area. Assistance is also required for such training programmes from the departments which are responsible for implementing environmental laws (e.g. FFPO, FO, CCA, Mines and Minerals Act, etc.) that also have to be enforced by police officers].

- Training on species identification is required for customs and quarantine officials for law enforcement, to prevent illegal export of indigenous species and to minimise entry of alien invasive species. Visual aids/databases are important to assist capacity building in this regard ***(Selected NGOs could assist with the training if they are provided with funds to prepare such material).***
- Establishing a special force within the Police Department with trained officials competent to enforce environmental laws by regional/local level police officers (PILF study).

Table 5.6: Barriers to effective law enforcement to support biodiversity conservation

Systemic	Institutional	Individual
Enforcement of environmental laws is less than satisfactory. There are sufficient environmental policies and laws to promote biodiversity conservation except for: - the lack of a law covering wetlands. - deficiencies in the Mines and Minerals Act No. 33 of 1992 as the offences under it are not cognizable. Hence law enforcement authorities do not have adequate powers to enforce some of these laws. - There are deficiencies in the NEA for EIA (Act No 56 of 1988) procedures in respect of mining and to prevent biodiversity loss.	Agencies such as the FD, DWLC and CEA and the police lack adequate cross-sectoral support for law enforcement. The Police Department does not have the necessary collaboration from relevant departments to enforce various environmental laws. However they do have close links with conservation oriented departments such as the FD. The police at regional and village level are constrained when enforcing the FO and FFPO, though they have authority to do so, for various reasons. These including (a) inadequate manpower to investigate complaints, (b) lack of logistics such as petrol and vehicles to respond to complaints, and (c) political interference. The police are constrained to enforce the Mines and Minerals Act as: - they cannot arrest the offenders for sand mining, (although sand can be apprehended) as the offences under this law are not cognizable. Enforcement of the NEA is difficult for similar reasons. - they cannot question or disregard trade licenses that may not be valid. - mining licences are issued by licensing agencies (e.g. GSMB) in an <i>ad hoc</i> manner.	Police officers often lack knowledge about biodiversity related laws, basic concepts of biodiversity conservation and sustainable use, and Protected species that have to be confiscated under the FFPO from private collectors. The FD and DWLC do not have legal officers and have to depend on the AG's Department for legal advice. This hampers effective law enforcement and raids when emergency decisions require legal advice. Often the legal officers at the AG's department cannot be contacted during emergencies as they are attending Courts. The field officers in the FD and DWLC are constrained due to inadequate manpower, lack of logistics such as petrol and vehicles, political interference and threats from "organised gangs" with influential support that are involved in such offences. The field officers of the CEA are constrained due to inadequate delegated authority as they can only report back offences to the head office. <i>[This can be amended through an internal CEA Board Decision, but has not been done as yet].</i> Field officers in the CEA do not have the power to apprehend anyone carrying out illegal activities that contravene the NEA. This constrains management of Environmental

Systemic	Institutional	Individual
		Protection Areas declared by the CEA.
Amendments to environmental laws take a very long time. The FO, FFPO, the Fisheries Act and the CCA have been all been under revision for a very long time.	Finalising environmental laws is a protracted process due to delays at: - the relevant ministries and sectoral agencies when the Legal Draftsmen's Department (LDD) gives the preliminary drafts back to them for scrutiny; - the Attorney General's department when the draft law is given to them for approval; - the LDD during translation. Sometimes the long delay in finalizing environmental legislation is due to poor stakeholder consultation and lack of transparency. In some cases the delay is due to political change and the resultant change of policy makers and policies.	There is a dearth of translators at the LDD due to the low salary structure for this category. This is the main cause for the delay in finalisation of environmental laws by the Legal Draftsmen's Department.
The general public are not familiar with environmental laws and citizens rights in this regard. Environmental offences such as collection of wild species and illegal sand mining are often given low priority by the police when responding to complaints. Informants are asked to make written complaints which they are afraid to comply with due to the fear of repercussions.	There is a dearth of programmes by conservation organisations, media or NGOs, to educate the general public on environmental laws and citizen's rights.	The judicial and police officers lack knowledge about Protected Species. (e.g. there is very poor knowledge of the species that should be confiscated under the FFPO. Consequently even domestic animals are brought to the NZG on court orders).

Annex 5.2 gives the status of actions taken to promote law enforcement to facilitate *in-situ* conservation of biodiversity

5.3 Developing and introducing measures and mechanisms for a national Access (to genetic resources) and Benefit Sharing (ABS) regime which ensures fair and equitable benefit-sharing from such use, including benefits to traditional knowledge holders

Addressing Articles (Article 15 and 19 (1&2))

BOX 5.2: The CBD and the need for an ABS regime

The main aim of Article 15 is to overcome the inequity to developing countries that are usually bereft of direct benefits from their genetic resources that are used by technology rich countries, and to thereby provide an incentive for biological diversity conservation (i.e. due to the benefits brought in) by creating a new relationship between CBD Parties that are providers and users of genetic resources. However, this relationship can also apply to other potential users of genetic material such as governmental actors from states that are not Parties to the Convention, and the natural and legal persons from such countries. This relationship is expected to provide an incentive for Parties that use genetic resources to contribute towards conservation in source countries. For this relationship to work, however, it is required to negate illegal access that brings no benefits to the country of origin of the genetic resources by the establishment and enforcement of regulations and control systems by potential providers of genetic resources. Sri Lanka as a country rich in biodiversity, with a high proportion of genetic resources that are found nowhere else in the world, is in the position of provider. To comply with Article 15, there should be adequate national laws to regulate access to GR. (This means stopping access that does not comply with the benefit sharing mechanisms of the CBD as promoted by the use of PIC and MAT.) Secondly there should be an effective mechanisms to enable benefits - from both the GRs and associated traditional knowledge provided - to the country as an incentive and justification for conservation of biodiversity.

Article 15 provides the foundation for 'the new relationship' by outlining the rights and obligations of each Contracting Party regarding access to genetic resources and their subsequent use. These obligations are premised on four fundamental concepts:

- States have sovereignty over genetic resources (Article 15(1));
- Parties should facilitate access between Parties (Article 15(2));
- Access should be subject to mutually agreed terms (Article 15(4));
- A prerequisite to access should be prior informed consent (Article 15(5)).

In addition, each Contracting Party is to take legislative, administrative *or* policy measures, *which aim* to achieve benefit-sharing (Article 15(7)). *This obligation is, however, mainly applicable to users of genetic resources as implied by its wording and the fact that IPR in the user countries may not promote benefits (especially through technology transfer) to the providers.*

Resolution 57/260 of 20th December 2002, adopted by the United Nations General Assembly at its fifty-seventh session, invited the CBD COP to take appropriate steps with regard to the commitment made at the World Summit on Sustainable Development "to negotiate within the framework of the convention on biological diversity, an international regime to promote and safeguard the fair and equitable sharing of benefits." An International Regime on Access and Benefit Sharing is being set up within the framework of the CBD (decision VII/19 of the COP). This has been further elaborated at COP 8 held in 2006. Unfortunately Sri Lanka could not attend this event due to funding constraints.

A workshop was held to identify capacity building needs in the context of setting up a national ABS regime:

- Capacity to develop and introduce measures for regulating access to genetic resources through PIC and MAT, to promote technology transfer (to the provider), and for benefit sharing as consonant with conservation and sustainable uses of genetic diversity.
- Capacity to establish fair and equitable benefit sharing from the providing of associated traditional knowledge and practices, while ensuring the protection of such knowledge among holders of such information.
- Capacity to enhance in-country use of biotechnology for biodiversity conservation and sustainable use of genetic resources to facilitate collaborative ventures with external country parties.

The outcome of the workshop and the recommendations that emanated from it are presented below.

5.3.1: Establishing a national access (to genetic resources) and benefit sharing (ABS) regime.

● Capacity needs and possible interventions

Systemic level:

- There is no national policy on Access and Benefit Sharing (ABS) and clear operational targets for the national regime on ABS.
- There are no guidelines on (a) what should be addressed when providing access to indigenous genetic resources for commercial use or other use by external country parties, and (b) on negotiating benefit sharing when collaborating with other countries for research or commercial products development.

The guidelines should address clarification of Intellectual Property Rights over the following:

- a. The gene constructs made during the course of research and the ultimate genetic constructs.
 - b. The end products (e.g. plants, animals, primers, microbes, biomolecules).
 - c. Technologies and associated technologies (divisional applications).
 - d. The rights of use.
 - e. The assignment of genetic constructs and technologies to 3rd parties, and
 - f. The rights of inventors and assignees.
- Sri Lanka is considering signing the FAO International Treaty on Plant Genetic Resources (ITPGR) for Food Crops. The impacts of this on a national ABS regime are not well understood by the relevant policy makers and administrators in Sri Lanka.

Institutional level:

- There is no standard formal institutional mechanism to regulate access to indigenous genetic resources by external country parties. Currently access occurs at various levels in the country and through various institutions; access occurs through illegal channels (e.g. by industries operating through the BOI, illegal smuggling, etc.) as well as through legal channels. (e.g. in the DOA as exchange for research and taxonomic purposes, as commercial products that have value in its unmodified form [under a permit system], specimens sent out legally by various institutions (e.g. universities, research institutions and the national herbarium) for taxonomic identification, and during collaborative biotechnology projects with foreign collaborators.
- There is no ABS regime at the national level although there are several institutions with the required mandate to regulate access to genetic resources, such as the DWLC assisted by the FD (for wild biodiversity), the DOA through the PGRC (for crops) and the DAPH (for livestock, although it also has the mandate to cover all animal exports). The benefit sharing aspects of an ABS regime are therefore not well understood or addressed by these institutions.
- There is need for a formal institutionalized mechanism (i.e. a Focal Point, ABS units in permit awarding authorities or 'Access determining Authorities', advisory networks, etc.) to coordinate and facilitate a national ABS regime. Such a mechanism should ensure that access to genetic resources is regulated by precluding illegal access to wild species, crops and livestock sans PIC and MAT, and without fair and equitable sharing of benefits with all national stakeholders, as envisaged by Article 15 of the CBD.
 - The Focal Point should be set up for best possible advantage (in terms of legal strength) in the MOE (and under the BDS). There should be special ABS units set up in relevant institutions that already have legal authority (under the present laws) to provide access to biological material to external country parties (e.g. Access Determining Authorities, or ADAs such as the DWLC, DOA and DAPH).
 - Once these ABS units in Access Determining Agencies (ADAs) are established they will need capacity building to facilitate the ABS regime in the best interests in the country.

Individual level:

- Staff manning the BDS, ABS Focal Point and the ADA ABS units once set up will need knowledge about the legal aspects of Articles 15, 16, and 19 and the impact of IPR regimes - both at the

national and international levels - on the national ABS regime. The BDS needs clarification on specific national obligations under Article 15 the CBD as there have been many varied interpretations.

- There is need for skills training and incentives (salaries and transparent career advancement) for officers once the FP and ABS units are set up to make them functional.
- Precluding illegal export of genetic resources will need the collaboration and assistance of the customs and quarantine services, so that skills training of these officers is important.
- There is need to build greater awareness about legal issues and IPR regimes among the heads of the BDS and ADAs; policy makers; scientists in the various ADA advisory committees and NGOs to make the ABS regime operational. This requires establishment of a group of legal personnel who are conversant with the Articles 15, 16 and 19 of the CBD who could assist with such capacity building. *(The expertise exists, but individuals need to be judiciously chosen by the BDS/MOE).*
- Awareness and guidelines on legal and IPR issues for local entrepreneurs are required if they are to enter into partnerships with foreign collaborators for the use of genetic resources in commercial applications.
- The assessment of the enabling environment for setting up an ABS regime is given in **Table 5.7**. A detailed capacity needs assessment and specific interventions for setting up of such a regime are given in **Tables 5.8 and 5.9**.

Table 5.7: Status of enabling Environment for establishing an ABS regime in Sri Lanka

Assessment	Capacity status
Does authority over genetic resources reside at the appropriate levels? Are decisions taken at the appropriate levels to regulate access to wild/crop/livestock biodiversity?	The Constitution of Sri Lanka implies that the government has a duty to safeguard the genetic resources for the benefit of the country. Hence a good enforcement regime is a constitutional requirement. “Sovereignty” in the Sri Lankan context (as in Article 15 of the CBD) is vested with the People. Therefore the State enters into negotiations with external parties as trustee or guardian of public interest, and should act accordingly. Hence Authority rests at the appropriate level. The DWLC (supported by the FD for forest products), the DOA (for crops) and the DAPH (for livestock) are the present access determining authorities (ADAs) acting on behalf of the state by providing permits for export of local biological resources. This is satisfactory, supported by existing legislation, and can be continued. However, there is inadequate technical knowledge within these ADAs about legal and IPR issues (entrenched in Articles 15, 16 and 19) and the formulation of MTAs to promote benefit sharing; even though the DOA has MTAs for exchange of crop genetic resources.
Are there adequate linkages with national plans, strategies and reports? Is the situation analysis completed? Is there adequate understanding of the situation? Have the problems been adequately identified? Do we have the potential solutions?	ABS had not been discussed at length in the BCAP, because ABS was at a very incipient stage in the global arena and considerably new at the national level. As such, there are no in-depth capacity assessments for an ABS regime in the BCAP. The recommendations to develop capacity in these areas are thus necessarily broad, and are mainly to initiate action and capacity building. Even so, many of these recommendations are valid to date, particularly for an ABS regime. National initiatives to address Article 15 to fulfil the CBD requirements have been slow, fuelled by the erroneous understanding that a special ‘access law’ was a prerequisite for an ABS regime. Although a situation analysis has been done in 2003 during preparation of the addendum at the systemic and institutional level, this has not been very successful at conceptualising the legal requirements, institutional needs and mechanisms for setting up an ABS regime in Sri Lanka. This is partly because there were no legal personnel in the Task Force dealing with Access to Genetic Resources. A more comprehensive situation analysis of priority issues was done during this study (NCSA) at the systemic, institutional and individual levels. The staff of the BDS and the chairman of the Task Force on Access to Genetic Resources for preparing the addendum participated at the NCSA workshop on ABS and provided valuable inputs. The legal situation was clarified through the NCSA project via a team which examined the legal framework required for an ABS regime in detail (this was deemed essential to carry out the assessment of the adequacy of the legal situation), and the problems that could arise with regard to illegal access. This was presented at the NCSA workshop on ABS (included as a position paper in the report on the NCSA ABS Workshop). The NCSA ABS workshop provides a good basis to build national capacity for an ABS regime that is beneficial to the country and in keeping with CBD objectives and Article 15. Although a definite mechanism to ensure benefit sharing via an ABS regime had not been given adequate consideration previously (i.e. the focus has been on the development of a new law which is now deemed unnecessary), this was done at the NCSA ABS workshop.

Assessment	Capacity status
	The requirements could be addressed if funds are available for the actions outlined below in Tables 5.8 and 5.9.
Is the present national legal framework adequate to enable ABS?	The existing laws adequately cover the granting or denial of a legitimate application made to the Government of Sri Lanka for Transfer/Access of Genetic Resources by another Country Party to the CBD, as well as by natural and legal persons from these countries and from “non-CBD Party” countries.
Are there laws to regulate access and prevent genetic resources being taken out of the country without PIC and MAT?	The legal framework is adequate for enabling PIC and MAT, but regulations may be required to facilitate this process under the existing laws. However, this requirement does not preclude the setting up of an ABS regime. However, illegal access to indigenous genetic resources occur due to poor enforcement of existing laws.
Can the public influence legislation, policies and programmes?	The public can to a great extent influence legislation, policies and programmes. However, there is poor knowledge among the citizens of Sri Lanka about this issue. The public lacks knowledge that they are co-owners of genetic resources along with the state. In general, awareness of ABS issues is very low among academics, policy makers (including politicians), the business community, the media, and most environmental NGOs, and even some officials dealing with access to genetic resources in relevant state departments.
Are all stakeholders in this sphere knowledgeable about the entire concept of Article 15?	Overall, there is very poor understanding among decision makers about the precise nature of national obligations under Articles 15, 16 and 19 of the CBD as users and providers of genetic material. Very few people also know that the existing national legal framework <u>is</u> adequate for an ABS regime. For instance the need ‘for a legal framework to regulate and facilitate ABS’ was confused by erroneous interpretations of Article 15 to be synonymous with the need for a new access law to facilitate providing access to genetic resources to external country parties and for benefit sharing. This is due to the common misconception that the term legal framework for ABS meant a specific access law, and mainly because much of these deliberations were by scientists and not senior lawyers conversant with the CBD.
Are participation, accountability and transparency adequate at present in this sphere?	Overall, transparency regarding access issues pertaining to genetic resources is inadequate, particularly in respect of industries operating through the BOI.
Is there adequate capacity to analyze global issues and respond to them?	This capacity is present among a very few individuals. Capacity in the BDS should be built to negotiate best possible options for Sri Lanka at international fora and the CBD COP. For example, Sri Lanka should participate actively in the deliberations for an International Regime on Access and Benefit Sharing within the framework of the CBD (decision VII/19 of the COP) which will address Access and Benefit Sharing (ABS) at the global level. There have been no inputs to this effort from Sri Lanka as yet. Sri Lanka also did not attend COP 8 which discussed the issue of an International Regime on ABS.
	Sri Lanka is considering ratification of the International Treaty on Plant Genetic Resources (ITPGR), but there is no clear

Assessment	Capacity status
	understanding on patent rights for genetic material that be provided by Sri Lanka under this treaty. For example, the ITPGR deals with access, technology transfer and IPR issues. These need to be examined carefully. For instance Article 12(3) (d) of the ITPGR decrees that material cannot be subjected to IPR in the form provided by a provider country. Hence if Sri Lanka provides a plant to another Party, that Party can patent a gene or a fragment of a gene isolated from the plant, with no benefits to Sri Lanka, but all the while conforming to the articles of the ITPGR. Sri Lanka should therefore look at this Treaty together with TRIPS and other agreements and national needs under the CBD. The legal status with regard to regulating export of biological resources in trade is not well known. The legal details about the WTO are not well understood, and the impacts of WTO on implementing Article 15 of the CBD are known only to a few legal experts.
Is there adequate capacity for negotiations? Where and how should this be built?	There is very poor capacity at the country level to negotiate benefit sharing through an ABS regime. There is also insufficient capacity to negotiate issues relating to ABS regimes at the international level.
Are the present institutional mechanisms and laws adequate to comply with access and ensure benefit sharing?	The current institutional procedures for providing permits for export of fauna and flora and the laws that govern them <u>do not preclude</u> granting of access to genetic resources for commercial purposes or the sharing of benefits with the state. The laws are sufficient (and there is provision for regulations to be gazetted where required) to facilitate an ABS regime. However, sharing benefits with holders of traditional knowledge linked with the use of genetic resources has not been investigated. The present institutional mechanisms are not sufficient for an ABS regime.
What capacities exist to formulate access policy/guidelines? Is there adequate capacity to conceptualize and formulate policies, legislation, strategies and programmes? Is there capacity to assess the legal situation and formulate regulations and amendments where required?	The ability to prioritize, plan and formulate programmes/mechanisms in respect of ABS is poor. Institutional capacity for policy formulation on ABS is as yet poor as there is inadequate knowledge among the relevant institutions about the full implications of Articles 15, 16 and 19. However there is adequate in-country expertise to advice and undertake this process if the correct people are contacted.

Assessment	Capacity status
Have people with knowledge, experience and expertise in legislation and access issues been involved adequately in the decision-making process in relation to ABS so far?	There are a very few people with excellent expertise on legal aspects of ABS in relation to Article 15, 16 and 19 of the CBD, Sri Lanka's constitution, material transfer agreements and IPR regimes. They have the capacity to help formulation of an ABS policy and to draft regulations under the existing laws when required. The involvement of people with very good legal understanding of all aspects of ABS and related IPR has been inadequate so far in any initiatives taken in this regard, probably because the legal and IPR aspects of benefit sharing are grey areas among many decision makers. For instance it was only the scientists who were involved in assessing capacity needs during the preparation of the Addendum. At the NCSA ABS workshop, there was consensus achieved about the legal status of ABS and capacity building needs.
Has science as well as legal issues been incorporated into the decision making process so far?	This has not been successful so far as the scientific community requires better knowledge of the legal aspects of ABS. There have been inadequate interactions so far between the legal and scientific communities to discuss the various aspects of ABS. The workshop on ABS through the NCSA was considered a very good start (as expressed by the participants) to bring together legal and scientific expertise. There is a need for legal and scientific persons to be brought together to consider the issues relating to ABS in the future. Similarly, it is required to bring together politicians and administrators to deal with this issue.
Are penalties for violating laws enforced adequate? If not what and where (systemic/ institutional/ individual) are the problems?	Penalties for violating environmental laws to preclude illegal access are not always adequately enforced. Further, poor interpretation (due to poor understanding) of laws relating to ABS has created loop holes for illegal access. For example, there is a perception that the BOI industries are exempt from complying with export procedures, and that they need not make a declaration of genetic resources being taken out or obtain permits to do so. This is, however, not the case as the law is applicable to BOI industries as well. The ABS policy should resolve such issues and strengthen the Focal Point to address conflict situations effectively (e.g. a remedial measure would be to make it mandatory for a copy of BOI agreements involving genetic material to be lodged with the Focal Point).
Is there adequate ability to monitor, evaluate, report and learn from past experiences?	The ability to monitor, evaluate, report and learn from past experiences has been poor as there is constant reinvention of the wheel. This should be avoided at all costs in the future.
Is there a national policy on ABS at the national level?	There is no policy as yet to deal specifically with ABS. This is a major constraint.
Are institutional arrangements adequate for PIC and MAT?	There is low institutional capacity for compliance with PIC and MAT as necessitated under Article 15 of the CBD, although the DOA has MTAs for exchange of crop genetic resources.

● Overall capacity building needs

Table 5.8: Points of intervention to establish a national policy for an ABS regime

Level at which capacity building is required	Establishing a national policy on ABS:
Systemic level	A national policy and an implementation framework (consonant with sovereign rights, national interests and the CBD) should be developed and receive Cabinet approval for its adoption. The policy should decree that all requests for sending out plant and animal matter (that fall within the ambit of genetic resources) should go through a Central Focal Point. Prior to embarking on formulating a policy on ABS, it is vital to provide transparency, and build capacity among all stakeholders (policy makers, administrators, citizens groups and NGOs) to understand why an ABS policy is required and what it seeks to achieve. If not misconceptions will delay and derail the entire process. Transparency in all actions should be maintained throughout the process which should be widely participatory. <i>[Institutional: The BDS needs capacity strengthening to do this; The report of the NCSA workshop on ABS and the paper prepared on legal aspects of ABS could be used as the first step to build capacity among scientists and decision makers, and could be used by the BDS to prepare background documentation. For example, the workshop report and the legal paper prepared can be circulated among the National Experts Committee on Biodiversity and to all stakeholders who participated at the workshop. Reinventing the wheel should be avoided as the workshop provided a broad consultative platform (covering wild, cultivated and livestock biodiversity) on this issue].</i> The initial framework and objectives of the policy should be presented for public opinion and for expert deliberation before investing on preparation of the full policy. This will enable stakeholder participation and consensus from the outset.
Institutional	The BDS should formulate a national policy and implementation framework that is consonant with sovereign rights and national interests. The BDS requires capacity building to: (1) coordinate the development of the policy and guidelines. Efficient inter-institutional coordination is required during policy formulation to cover all aspects of wild biodiversity, crops and livestock. (2) organise effective consultations and build consensus, and (3) formulate a communication/awareness strategy for consensus building throughout the policy formulation process to enable: • strategic identification of all stakeholders to be involved in the policy making process. • customized training programmes and awareness workshops for various target groups on the CBD requirements and legal issues prior to participation in the policy formulation process (particularly for NGOs, policy makers and ADAs). <i>[suggested: The BDS could work with a partner organisation or NGO, preferably with legal expertise, to help organise these awareness programmes]</i>

Level at which capacity building is required	Establishing a national policy on ABS:
	The BDS should select persons with multi-disciplinary skills for preparation of policies and guidelines (i.e. persons with scientific, legal/IPR, administrative, communication, writing and policy analysis skills; knowledge of the CBD provisions and the impact of other national policy and other international conventions that Sri Lanka has ratified [e.g. WTO] which may have an impact on a national ABS regime).
Individual level	Prior to development of the policy, capacity should be built at the individual level within the staff of the BDS and other agencies spearheading the ABS regime to understand: • implications of ABS, using awareness workshops on CBD requirements, legal implications, MTAs, IPR, impacts of trade related conventions (as done at the NCSA ABS workshop). • Carry out effective and transparent consultations to gain consensus at all stakeholder levels, including the Cabinet, for the policy.

Table 5.9: Specific capacity building needs to establish and implement an ABS regime in Sri Lanka

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
Institutional and Individual levels: <u>Focal Point</u> (The functions of a focal point are further elaborated in the NCSA ABS workshop report). The FP should be staffed with persons of relevant expertise (training should be provided for this). It should be well equipped and provided	There should be a <u>single</u> central body or focal point (FP) for all matters pertaining to inflow/ outflow of ALL <u>plant and animal</u> and other genetic resources (GR). A Focal Point (a special unit with trained staff) should be set up as a coordination centre with administrative and legal powers. This unit should be established in the MOE/BDS as it should be within an institution with strong legal status (i.e. a ministry). The Focal Point will not be the access determining agency, but will receive access requests, provide potential clients (access requesting Parties) with information on national access policies, channel access applications to relevant ADAs and follow-up action until access is provided or declined, track compliance with access agreements if genetic resources are provided, ensure flow of benefits to appropriate stakeholders and facilitate action by the relevant ADA in the event of non-compliance to the MTA benefit sharing provisions. All applications by foreign research institutes /commercial entities/persons for exchange of, or access to, indigenous genetic resources should go through the FP, and all requests for foreign collaboration on use or exchange of genetic resources by local state research institutes/private sector should be notified to the FP. The FP should direct foreign requests for access to GR to the relevant ADA for further action, after a preliminary examination.

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
with the required resources.	Therefore, the Focal Point should have capacity to: • Facilitate and maintain wide local (i.e. government, business and NGO sectors) and global networks on the subject areas that are of direct relevance (e.g. research, legal, trade and exchange, production and application, etc.) Such a network could facilitate sharing of local and global knowledge to promote national benefits from the ABS regime. • Establish an advisory committee of experts/specialists with multi-disciplinary skills to advise on ABS issues and where required establish sub-committees of specialists to help in specific areas on ABS and GR. This will constitute a pool of select experts to give technical back-up on assess issues to the Focal Point and to the ADAs at their request. • Prepare guidelines for: ○ (a) Focal Point staff on actions to be taken when a request is received and for follow up action after the request has been sent to the ADAs and after the agreement is signed. ○ (b) staff of ADAs on facilitating ABS, and ○ (c) prospective clients, both external and in-country, on the national policy on ABS and the procedures under which access will be granted. There could be different brochures with guidelines for different categories of clients. • Prepare standard MTAs which can be adapted by the ADAs on a case by case basis. The FP could examines and improve on the MTAs now being used by the DOA (e.g. the DOA agreements can be examined by the FP's expert advisory committee and adapted by the FP to form standard agreements to prevent re-inventing the wheel). The legal aspects should be carefully considered to safeguard national interests. (The standard application forms should be comprehensive enough to get vital information (e.g. purpose of GR applied for; locality of its use, etc.) to assure safeguarding national interests and help administering the agreements. Particular attention should be given to rights to future use, assignment of generic constructs to third parties and protecting rights of inventors) • Develop, where appropriate, a mechanism for foreign payments received for GR to be channelled through the Ministry of Finance to the receiver (at the appropriate national level). • Adopt measures to enhance the knowledge and skills to apply the laws and regulations relating to ABS in the ADA/ABS units and other major stakeholders. • Develop skills in the BDS and ADAs to negotiate benefit sharing that is in the best interests of the country. • Establish a web-based preliminary application procedure for external country Party requests, and for local Parties if

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
	there is foreign collaboration that is open to the public. (Any public comments received about access requesting Parties should be forwarded by the FP to the ADAs). • Monitor the prospects, effects and practices of sharing Genetic Resources in the perspectives of both the giver (provider) and receiver (user). • Advise the local private sector on legal aspects (including IPR) and procedures to be followed if they are collaborating with an external country party on the use of genetic resources to ensure national interests. Where required, the Focal Point could negotiate with the external party on behalf of the local company. The ABS policy should make it mandatory that local companies planning collaborative ventures of this nature should inform the FP. • If requested, negotiate with the external party on behalf of the local company. <i>[suggested: NGOs such as EFL, Citizens' Trust, etc. could assist the FP with this activity].</i> • Establish a monitoring mechanism to track the use of all GRs provided, and to track benefits to be received by the country (to prevent fraudulent use of GR by user). • Liaise with the ADAs, the Foreign Ministry and other relevant institutions to facilitate the ABS regime and ensure its efficiency. • Liaise with the BOI to ensure compliance (as they cannot supersede the laws of the country), and with other relevant bodies that impact on the ABS regime to prevent conflict of interests jeopardising benefits received by the country. • Establish a database on foreign companies that deal with genetic resources to prevent biopiracy and make this available to the ADAs. The Focal point should have authority to reject applications if the applicant has a bad track record or has been blacklisted previously. <i>(A list of such blacklisted companies and individuals is available with the Customs Department).</i> • Establish a database on holders of traditional knowledge on the use of GRs and the type of information they hold to enable a flow of benefits to them from any relevant GR provided to external country parties (or conversely liaise with an institution that will hold such a database to prevent re-inventing the wheel). The database should indicate whether a particular genetic resource is used by a particular community. This information should be provided to ADAs. (IPR of traditional knowledge holders should be safeguarded after transparent consultation with legal experts as given in the section below). The possible activities of a FP were further identified in the legal paper prepared for the NCSA workshop on ABS.
Individual level (at the FP)	The staff at the FP require capacity for: (1) coordination of the entire ABS regime, (2) preparation of guidelines and providing advice on ABS, and (3) effective consultation techniques and consensus building through a communication strategy. (It is important that the FP staff are adequately trained prior to commencement of the ABS regime on communication, consultative processes, and the relevant technical (legal) aspects).

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
	Specific capacity building required for staff (Focal Points and ABS units in ADAs): • Basic legal knowledge on the implications of ABS. • Basic knowledge of legal requirements in respect of MTAs. • Basic knowledge of the availability of genetic resources and biology of species from which the resources are taken. • Capacity to negotiate and administer terms with potential external clients for GRs. • Skills to process applications and track process and benefits. • Skills to prepare a communication strategy and to implement it. Capacity should be built through training workshops and on the job training with experts. <i>[Suggested: Resource persons who contributed towards preparation of the legal paper for the NCSA ABS workshop (including the legal and policy expert for the NCSA) could provide expertise on legal issues. These workshops and training initiatives could be organized by the BDS when the FP is set up].</i> The FP will have to engage in providing: • customised staff training for ADA ABS units (in the DWLC, FD, DOA, and DAPH), Customs Department, and the Plant and animal Quarantine Services, NZG, NARA, NBG (and national herbarium), National Museums, CARP and NSF. This includes IPR issues and drafting of MTAs. • awareness and skills training on legal and scientific aspects relevant to ABS on legal and IPR issues regarding Articles 15, 16 and 19 among members of advisory committees for ADAs;. • customized training programmes and awareness workshops for various other target groups (e.g. NGOs, holders of traditional knowledge, relevant state departments, policy makers, and media). Through such programmes politicians could be supported to make decisions based on scientific facts. Politicians and administrators should be brought together at these training workshops. <i>[Suggested: The training workshops could be organised by the Focal Point in collaboration with partner organisations (e.g. biotechnology committee of the National Science Foundation, NGOs with legal expertise and MTAs, the legal panel convened by the NCSA for advice on ABS, etc)].</i>
Institutional All Access Determining Agencies [ADAS): DOA, FD, DWLC. DAPH]	All Access Determining Agencies [ADAS) which comprise the institutions currently mandated with providing access (DWLC supported by FD, DOA, and DAPH) should set up special ABS units. The ADA's can draw upon their individual advisory committees (already in existence under the laws that govern them) when determining access on a case by case basis, but the Heads of ADAs should be enabled to co-opt specialists from the Focal Point's Experts Committee on a case by case basis. Any complications in the access request can be referred back to the Focal Point by the ADAs for further clarification.

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
	It is necessary to establish a mechanism to incorporate these institutions into an overall institutional framework for an ABS regime, with all the activities coordinated by the Focal Point. Stand alone departments do not have the capacity to perform all the tasks required of an ABS regime. Hence a network coordinated by the Focal Point is essential.
All ADAs and NBG/Herbaria, NZG FD, SCPP, PGRC. Capacity building should be provided for specially selected staff.	Capacity building requirements: • Skills for appropriate analysis and understanding of access requirements and skills to process applications. • Skills for preparation of different types of MTAs on a case by case basis - <i>[Suggested: resource persons for training could be drawn from the legal panel set up by the NCSA for preparation of the ABS position paper]</i>. However, these MTAs should adhere to the formats prepared by the Focal point, the ABS policy and the guidelines issued by the FP. • Skills for negotiation (for key staff in the FP and ADAs).
The BDS	Should have capacity to: • Establish an Advisory Experts Committee (comprising both lawyers and scientists and representatives of all ADAs, Foreign Ministry, AGs Department, Customs Department, Quarantine Division (SC&PPD of the DOA), Plantations Ministry, Ayurveda Department, and scientific and legal experts (whether the BOI should be represented was debated). • Establish and maintain meta-databases relevant for ABS (including a meta-database on traditional knowledge.)
Centre for Traditional Knowledge (suggested in the Addendum to the BCAP). Until such a centre is established the BDS should take up this task.	If such a centre is set up, it should build capacity to: • Maintain a database of traditional knowledge holders. • Explore setting up of a <i>sui-generis</i> system for benefit sharing from traditional knowledge. • Provide information to the FP on privately held traditional knowledge to enable benefit sharing with local communities - where such knowledge associated with GR is used.
NSF and CARP	Should build capacity to: • Promote the development of biotechnology capacity in the country to identify, characterize and assess the value of indigenous wild and crop genetic resources that is being provided (this is expected to enhance the country's scope for negotiation on benefit sharing). <i>[suggested: A biotechnology policy in terms of genetic resources is lacking. NSF should be given the mandate by the Ministry of Science and Technology to formulate such a policy].</i>

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
Advisory Committees for ADAs.	Capacity building is required for individuals to: • Understand the legal and IPR aspects. (The heads of ADAs should be able to co-opt other experts to the institutional advisory committees on a case by case basis as required). • Broaden scientific knowledge on the specific genetic resources to be provided (where this knowledge is inadequate, the heads of ADAs can co-opt experts to the institutional advisory committees on a case by case basis). • Build skills for appropriate analysis of access requests on a case by case basis after careful consideration of scientific and legal (including IPR) aspects.
Customs and Quarantine Departments	The Customs Department is short of staff (i.e. numbers as well as trained staff). Hence training of existing staff is a critical need. There are currently only 3 persons in the biodiversity unit of the Customs Department, and two have not undergone any training so far. The Quarantine Service at the airport needs strengthening. Quarantine checks are done only at the request of the Customs Department so that better coordination and collaboration between the two departments are warranted. • The security check at the entry point could be used for detecting live material by the use of experienced security officers (or by training the security staff to identify live material). Customs and quarantine Departments could take over investigations if live material is being illegally exported. • Awareness creation on ABS and skills training is required for both customs and quarantine staff to identify whether the material being taken out of the country is what is in the MTAs. This requires training on identification of indigenous plants and animals. • Skills training and equipment is required to facilitate detection of illegal export of live material (This can be expanded to cover alien species and pests brought into the country). • Visual databases are required to help identification of species that are in the permit (NGOs could help with this). • Incentives (rewards) for customs and quarantine staff (and also airport security staff, if they are used) could be provided to facilitate detection of illegally exported biological material. • The Customs Department should have access to a database of blacklisted companies and individuals developed by the FP.
NGOs	• NGO capacity building is particularly important to enable understanding of the varied implications of ABS prior to any consultation processes. • Selected NGOs (i.e. selected by the FP advisory committee) could help build capacity among the customs and quarantine staff and for identification of potential genetic material being taken out illegally.
Attorney General's Department	• The AG's department should be represented in the FP's Expert Advisory Committee.

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
	The AG's department should establish a separate unit to deal with access issues. (as skills training is needed on access issues)
BOI	- It should be made mandatory for a copy of all BOI agreements relating to genetic material to be sent to the ABS Focal Point. This is important as BOI industries presume that they can export (and import) live material without informing the Customs Department or the Quarantine Service. - There should be awareness creation among BOI companies (using leaflets) to indicate that they have to comply with the legal requirements pertaining to access to GR and cannot override the existing laws of this country. - There should be a clause in BOI agreements to inform clients that they should comply with national policy and laws when they are taking out or bringing in biological material or soil with usable DNA or RNA.
Foreign Ministry	- The Foreign Ministry should be closely involved with the ABS process and know the procedures. - Competencies should be built among relevant officials about the legal aspects of the CBD and other conventions that have legal implications on the ABS regimes. - A special unit with required capacity should be established in the Foreign Ministry to link-up with the FP. This unit should channel applications for GR received by the Foreign Ministry to the FP.
Private sector (there is poor awareness about ABS and the scope for local business)	- Awareness should be built among the local business community about the potential of using genetic resources for product development and thereby enlist their help to prevent biopiracy by foreign companies. [This should be done via the chambers of commerce]. - Training programmes should be held for business people entering into collaborative ventures with external country parties for the use of GR to apprise them on legal implications of patents, IPR and the CBD provisions for promoting fair and equitable sharing of benefits between users and providers of genetic material. The FP should apprise the relevant agency about the need for an MTA and provide guidelines on the procedures to be followed. <i>(this means that the focal point should be geared to assist the local business community to follow the correct procedures and advise on IPR requirements, etc.).</i> - Capacity should be enhanced within the private sector for biotechnology using genetic material. - If requested, the Focal Point should have capacity to negotiate with the external party on behalf of the local company. [suggested: NGOs such as EFL, Citizens' Trust, etc. could assist the FP with this activity].
Research institutions dealing with biotechnology	Centres of excellence for biotechnology (if set up) could be designated the focal points for technology transfer from a user of GR (under Article 15, 16 and 19) under an ABS regime. These Centres and other Research Institutes should have technical capacity built to correctly identify/authenticate genetic signature of material, and to identify, characterize and assess the potential value of GR.

Level at which capacity building is required	Capacity needs to implement an ABS regime in Sri Lanka
DWLC, FD, Customs Dept., Quarantine Service, DAPH, PGRC	Capacity should be built to enforce the relevant laws to prevent illegal export of GR.
Public Sector involvement to ensure transparency of process	• The BDS may not be able to ensure transparency in the access determining process as it is a government body. Thus the general public and NGOs have a responsibility to assist the BDS by acting in a watch-dog capacity. • Interested civil society groups representing the general public should have a knowledge of access determination as they are joint custodians of genetic resources. Knowledgeable members of the General Public could help the FP identify false requests for GR. • Public participation could be obtained by setting <i>up</i> a web-based application procedure for external country parties as a procedure of PIC. This would apply to access requests by the local private sector if there is foreign collaboration. When access to genetic resources of wild species is sought, the public has the right to know that a particular plant or animal or microbe (or derivative) is being sought. To preserve confidentially (to safeguard IPR) it may not be required for the client to divulge on the web the purpose for which the resource is sought. This could be declared after the initial web based request in the forms provided by the FP which will lead to PIC and MAT. • The web-based application will not be a requirement for the local private sector to safeguard IPR and encourage use of indigenous GR, unless there is foreign collaboration.

*****GEF funds should be sought for a major multi-institutional capacity building initiative for establishing an ABS regime in Sri Lanka.***

References:

Paper on Developing Capacity To Facilitate Access To Genetic Resources Under Article 15 of the CBD To Enable Benefit Sharing prepared for the NCSA workshop on ABS by Ruana Rajapakse Attorney-at-Law, Shalini Ratwatte Attorney-at-Law, Jagath Gunawardena Attorney-at-Law and Legal and Policy consultant NCSA Project, Jinie Dela, Biodiversity Consultant NCSA Project, Mahen Watson, Project Manager NCSA Project; With contributions from Seneka de Saram, Attorney-at-Law and Govinda Jayasinghe, Attorney-at-Law.

Defra report on Review of the experience of Implementation by UK Stakeholders of Access and Benefit Sharing Arrangements under the Convention on Biological Diversity.

5.3.2 Ensuring fair and equitable benefits from traditional knowledge associated with genetic resources

Addresses (Articles 8(j) and Article 15)

- ***This is a cross-sectoral issue relevant for all Rio Conventions, and is applicable for traditional knowledge associated with the use of all types of biodiversity.***

Indigenous knowledge on biodiversity and its use in farming, ayurvedic medicine, home remedies, etc. is an important information resource in Sri Lanka. Some of the information on medicine and crops is documented in *ola* leaves, but much of the information is in the memory of old medical practitioners, farmers, priests, and village elders; and this information is passed down through oral tradition from one generation to the next. While it is important for this information to be compiled, documented and archived, in so doing, it is equally important to see that this traditional knowledge is adequately safeguarded, and made accessible only when measures can be taken to ensure that any benefits derived from its use are equitably shared with the knowledge holders. Further, According to Article 8(j) use of traditional knowledge and innovations should be used with the approval and involvement of the holders of such knowledge.

Several attempts have been made in the past to institute a proper institutional mechanism to protect and propagate biodiversity related traditional knowledge. An example is the Centre for Traditional Knowledge established in the School of Forestry in the University of Sri Jayewardenepura. None of these efforts have been sustainable over the long-term due to the lack of an institutional mechanism with strong state involvement.

Consultations during this study with traditional knowledge holders and other interested members of the public indicate that practitioners of traditional medication are averse to impart their knowledge for storage in modern data-bases. This is particularly because there are secret recipes which they believe would lose their potency if publicly disclosed, and age old customs and practices for such knowledge to be handed over to a disciple who is chosen with great care based on astrological and other considerations. There is also apprehension that their knowledge will be exploited and used by others for commercial gain from which they, their families or communities, will get little or no benefit. While most recommendations to archive traditional knowledge are based upon what is believed to be a widely participatory process, holders of traditional knowledge associated with genetic resources may not express their concerns in scientific fora. As such, the information given by such knowledge holders (especially in the case of medicines and other curative processes) for storage in databases are suspect, and probably do not contain the principle ingredients or the correct procedures. Hence alternative procedures for supporting the preservation of traditional knowledge associated with genetic resources through the customary oral tradition should be sought. **Annex 5.3** gives status of enabling Environment for benefit sharing with traditional knowledge holders for an ABS regime in Sri Lanka

● Overall priority capacity needs and possible interventions

Systemic:

- There is no policy to address benefit sharing with traditional knowledge holders and ownership cannot be claimed once such knowledge enters the public domain.
- The legal rights of traditional knowledge holders have not been examined and the type of information that can be documented and archived to preserve IPR has not been correctly identified. As yet there appears to be very little remedial measures to protect IPR on traditional knowledge, but this should be investigated.
- Capacity should be built to explore and use alternative methods for protecting traditional knowledge associated with genetic resources (along with traditional knowledge on other technologies relating to sustainable use) rather than archiving them in databases (i.e. assisting traditional knowledge holders to pass down their knowledge through the oral tradition to a pupil of their choice).
- Overall there is a general failure to recognize the value of traditional knowledge in the pharmaceutical industry, agriculture, livestock and crop improvement and other measure for

sustainable use of biological diversity. There is no proper mechanism as yet to protect and propagate biodiversity related traditional knowledge.

- Capacity is inadequate for fair and equitable sharing of benefits from traditional knowledge that is already in the public domain in Sri Lanka. However, the concept of what is in the public domain information is not clear to many.
- There has been no initiative to identify the practical possibility of establishing ownership of traditional knowledge among particular communities or individuals for benefit sharing through the ABS regimes. This could be done in collaboration with the Focal Point for ABS.
- There is need to initiate an investigation (using the expert networks) on the issue of benefit sharing from traditional knowledge with such knowledge holders and whether a *sui generis* system can be adopted and whether benefits could be channelled to local communities through the normal regional administrative systems (e.g. Divisional Secretaries)

[Suggested: A sub-committee comprising members of the legal team which developed the legal position paper for the NCSA ABS workshop and other relevant persons could look into the possibility of developing a sui-generis systems. This study should be done prior to preparation of a policy on ABS].

Institutional:

- There are no institutions dealing with this aspect at present. Capacity should be built in an existing centre to take up the cultural aspects of biodiversity which will also address traditional knowledge associated with genetic resources as a subset of its activities. Such an agency should identify a mechanism to protect traditional knowledge associated with genetic resources and benefit sharing (as well as traditional knowledge for other technologies relating to sustainable use). Any centre for tradition knowledge should have close links with the Focal Point and ABS to regulate and control access to genetic resources provided by Sri Lanka to external country Parties.
- There is no database of traditional knowledge holders (i.e. genuine knowledge holders). Such a database should include the particular areas of expertise of the knowledge holders so that they can be contacted when necessary (this is acceptable to the knowledge holders rather than storing the 'knowledge'). Holders of traditional knowledge associated with genetic resources used for medicinal, curative and other purposes (i.e. agriculture and livestock improvement) should be considered for inclusion in the database. This could be addressed by a Centre for cultural aspects of biodiversity.
- Civil society organisations and environmental NGOs should be empowered to play a prominent watch dog function and to apprise traditional knowledge holders about their rights within an ABS regimes and about IPR issues. (However, NGO capacity to carry out such empowerment is limited at present, as they too are not fully aware of the need and nature of an ABS regime).

Individual:

- Officials at any Centre for Traditional Knowledge (recommended to be set up in the Addendum to the BCAP) and state officials dealing with ABS regimes should be made aware of international legal requirements for dissemination of information and knowledge. This is an area that is currently very poorly understood in Sri Lanka among individuals and institutions involved in setting up databases.
- Managers of any existing databases on traditional knowledge should be made aware that while patents on genetic resources or other bioproducts may cite the original source of the information, there is no legal requirement for benefits to be shared with the original traditional knowledge holder/s.
- Traditional Knowledge holders should be made aware of their rights within an ABS regimes and in connection with IPR issues, and advised on how they can protect their knowledge as trade secrets and about benefit sharing possibilities This can be through a Training of Trainers activity. Such knowledge does not exist at present.
- Traditional knowledge holders should be helped by the Focal Point for ABS to negotiate benefit sharing as and when this comes up with the aid of the Centre for Traditional Knowledge.

[Suggested: Members of environmental NGOs such as EFL, Environmental Journalists Forum and Indigenous Practitioners fora could assist the ABS FP until a Centre for Traditional Knowledge is established].

5.4 Developing and introducing measures to enhance national capacity for biotechnology using genetic resources for sustainable use of biodiversity

Addressing Articles (Articles 10, 12, 16 and 19)

BOX 5.3

The CBD and the relevance of promoting biotechnology using genetic resources

The Convention on Biological Diversity takes particular note of the difficulties of developing countries to “preserve” biological diversity *per se*, and promotes the gain of benefits from its components. This includes “equitable sharing” of benefits arising from genetic resources (Article 15) through biotechnology, including the transfer of such technologies by Parties that are “users” of genetic resources to Parties that are “providers” (Article 16).

Articles 15 and 16 are both, however, contentious. This is mainly due to the concerns of developed countries about the implications of technology transfer (i.e. whether this may force their private sectors to transfer technology, including modern biotechnology) to other countries. On the other hand, governments of the countries of origin of genetic resources - mainly developing countries - consider technology transfer to be an essential element of the Convention as a counterpart to the provisions on providing access to genetic resources. This has resulted in rather complex and ambiguous wording in Article 16 which leaves room for differing interpretations. The controversy regarding Article 16 has begun to abate somewhat recently, with some source countries having strengthened their own capacities for biotechnology and using their indigenous genetic resources rather than ‘wait’ for technology transfer in this regard. This is also relevant for Article 10 on sustainable use. Stronger capacity for biotechnology using GR also enhances potential for benefiting from technology transfer. This is relevant for Articles 15, 16 and 19.

This assessment particularly focused on what capacity strengthening is required at the national level to promote biotechnology using genetic resources in Sri Lanka. What are the strengths, weaknesses, opportunities and threats? The assessment was based on institutional visits, a roundtable on Capacity Development in Sri Lanka for Biotechnology Using Indigenous Genetic Resources, a group discussion on use of biotechnology at the workshop on Capacity Building Needs to Ensure Benefits from providing Access to Genetic Resources, and discussions with the business community and members of the public.

There have been many initiatives to enhance the level of biotechnology capacity in Sri Lanka, but most do not use genetic material *per se*. The National Research Council (NRC), the Council for Agricultural Research Policy (CARP) and the National Science Foundation (NSF) have identified priority areas for research in biotechnology. The Ministry dealing with Science and Technology and the then Ministry dealing with Agriculture, Lands and Irrigation have instituted programmes for training at various levels and for provision of equipment. Several training programmes have been carried out in the country on specific areas. For example, the AgBiotech Centre at Peradeniya has conducted a training programme for the first time in Sri Lanka on Genetically Modified Organisms (GMOs) and Functional Food Product (FFP) testing with funds from the biosafety framework project. The staff continues to conduct training programmes, short courses and demonstrations, but is constrained due to lack of funds. Anyone can access the technology at this Center with the permission of the Director, or may carry out work in collaboration with the Centre. Such persons/institutions have to provide consumables for the project and pay a nominal fee to the Centre to cover staff salaries (staff time) and maintenance. However, this is not well known among prospective clients.

Despite the many initiatives, biotechnology based on the use of indigenous genetic resources has been very inadequately explored and developed. Worldwide, biotechnology is currently used in a wide range of commercial applications using genetic material or their derivatives. Enhancing biotechnology capability at the national level is required for Sri Lanka to make best use of

indigenous genetic resources. It will also provide considerable opportunities for economically viable sustainable use of Sri Lanka's rich genetic diversity as an added incentive for biodiversity conservation in the country.

Sri Lanka has considerable expertise in plant genetic resources conservation in terms of agricultural crops compared with several member countries of SAARC, and this has been shared at the regional levels through training programmes covering laboratory work and practical research including field work. Capacity building is particularly important in the field of biotechnology and bioprospecting in the agricultural sector, and for medicinal use. This requires developing state sector - business partnerships with the local private sector. Further, low quality products from biological resources are one of the reasons why Sri Lanka finds it difficult to enter the export market for value added products, and is concentrating on the trade in raw materials. This can be alleviated by the production of high quality bio-products through biotechnology.

BOX 5.4

Scope for using biotechnology based on genetic resources in Sri Lanka

- Biotechnology is of immense value for biodiversity conservation. There is as yet insufficient information on population (genetic) diversity, which is vital for conserving threatened wild species and conserving crops for food security. Tools such as DNA fingerprinting (which are available in the country) could be used for genetic identification of populations of wild species, medicinal plants and crops
- Functional food products are an important area for biotechnology development in the future. This requires study of what genes (human) are expressed/suppressed by such foods to understand their health benefits (i.e. this action may be connected to biomolecules [produced by genetic material] in such foods)
- There is a high potential for using biotechnological tools and genetic resources in the rubber industry, medicinal plants, and floriculture. In the case of medicinal plants Sri Lanka has the advantage of being able to use associated traditional knowledge.
- Sri Lanka has ample scope to move forward in developing biotechnology using indigenous genetic and to patent commercially development products.
- The providers of technology (i.e. the users of genetic resources under Article 15 of the CBD, and those who have to transfer technology under Article 16 of the CBD to providers of genetic resources and share benefits with the providers) are at an advantage when there is low biotechnology capability in the provider country. It is important for Sri Lanka to enhance in-country capacity for biotechnology to be able to maximise benefits from technology transfer, access such technology and negotiate the best deals through mutually agreed terms when providing access to genetic resources.

Source: Workshop on Roundtable Meeting to discuss Capacity Development in Sri Lanka for Biotechnology using Indigenous Genetic Resources

Annex 5.4 gives status of in-country capacity for using genetic resources in biotechnology.

● Overall priority capacity needs and possible interventions

Systemic:

- Policy makers and local business community (in general) are not aware about the scope for biotechnology using genetic resources in Sri Lanka, and the state of the art in this sphere.
 - The database emanating from the review on biotechnology (prepared by the Biosafety Framework Project carried out by the MOE) is not yet made accessible on the web. This indicates 'who is doing what and where', and could be accessed by industry and other interested parties.
- The business community has little communication with the scientific community about the possibilities for business-state collaboration in biotechnology using genetic resources.

[suggested: NSF biotechnology Committee can build this link by working with the Chambers of Commerce].

- Coordination among biotechnology institutions is poor and should be enhanced:
 - good coordination is required as many ministries and agencies are involved in biotechnology. The Ministry of Science and Technology aims to enhance capacity for biotechnology and is presently seeking to promote collaborative ventures.
 - teams with different expertise comprising individual scientists from different institutions could be established and coordinated. (e.g. India has an excellent arrangement for coordination in biotechnology in this regard). A similar team is required to offer legal advice to biotechnicians and help draft access agreements (with external country parties) for collaborative biotechnology projects and to deal with IPR issues.
- There is no specific national policy to develop biotechnology using genetic resources, and specific requirements are not addressed in the general biotechnology policy. A specific biotechnology policy could provide opportunities for people trained on various aspects of biotechnology using genetic resources to form groups or teams in their particular field of expertise irrespective of the institutions they are attached to, and while working at their usual jobs (This will enable making best use of in-country expertise). The policy should allow the private sector to participate in such collaborations. *(note: This policy could be in line with the biosafety policy and the biotechnology policy but would focus more on developing biotechnology using genetic resources).*
- There is no formally established forum for local experts in biotechnology using genetic resources to meet and exchange views and update knowledge (i.e. training projects, overseas exchange visits, etc.). This forum could also be used for local scientists to meet visiting scientists from other countries, especially those from technology advanced countries. Such a forum could be constituted on similar lines as the Institute of Engineers (or the Institutes of Chemistry or the Institute of Biology), and should be established under an Act of Parliament.
- There are poor opportunities for interaction with foreign scientists working on biotechnology using genetic resources, as few local scientists get opportunities for international exposure. Collaboration with foreign agencies is not vital, but short term visits from scientists from technology rich countries would be useful for exchange of expertise. Informal networks of this nature do operate through personal contacts, but a more formal arrangement (e.g. through a MOU with overseas institutions) would be beneficial, and could lead to collaborative work on biotechnology using genetic resources and benefit sharing.
- There is lack of awareness in industry on biotechnology work done nationally, and the available expertise in state research institutes & universities.

Institutional:

- Establishment of high-tech facilities with trained R&D & technical staff could help produce value added products to internationally accepted standards, but biotechnology requires equipment and facilities which are very expensive for a developing country such as Sri Lanka. Therefore it is desirable to have a central laboratory (or a few central laboratories) that can be accessed by research institutions, universities and all biotechnology research workers.
- While there are resources and scope for biotechnology development for horticultural and medicinal plants, Sri Lankan institutions have insufficient capacity to forge ahead with the necessary experimentation and development. *(note: The AgBiotech Centre is carrying out tissue culture of horticultural plants, but is constrained by dearth of funds and clients).*

- For the institutions where funding for biotechnology is not generally a problem, delays in obtaining equipment and chemicals due to administrative and financial procedures are a severe constraint (i.e. especially because of government tender procedures). This is mainly because there is poor knowledge within institutions that government tender procedures do allow deviations with proper justification. (e.g. the required material can be ordered directly from the parent companies, provided a good and authentic case is made, with justification that this process is vital to expedite work). This procedure is not well known by research scientists and administrators. *(The NSF has addressed some of these issues and hopes to introduce a scheme whereby funds will be given directly to the scientist with clear procedures for purposes of accountability).*
- The AgBiotech Centre specifically needs help to continue functioning. It was set up under an ADB project, and has all the necessary equipment, but the staff salaries are not financed by the government. This results in poor job security for trained staff, making it difficult to retain the very committed staff in this institution. The staff conducts training programmes, short courses and demonstration for clients to fund their salaries. However, clients for biotechnological training and applications are infrequent. Greater awareness of the potential for biotechnology among the business sector and state incentives to promote such biotechnology applications is required.
- Biotechnological capacity at the VRI requires considerable strengthening and there is a critical need to retain trained staff as there is competition from better remuneration and job prospects overseas. This also ties up with the need to enhance the infrastructure of the VRI as a centre for storage of animal germplasm.
- The continuation of the ITI biomapping programme on medicinal plants is jeopardised due to the lack of funds.

Individual:

- Scientists involved in biotechnology using genetic resources lack:
 - (a) negotiation skills,
 - (b) administrative skills,
 - (c) proposal writing skills and skills for conceptualizing the work at hand
- Attorneys handling IPR matters lack:
 - adequate knowledge on legal and IPR requirements for clients working with external country parties or their representatives.

Possible interventions:

- A policy for biotechnology using genetic resources- which takes note of the policy for an ABS regime - should be undertaken by the Ministry of Science and Technology and the NSF.
The policy should allow:
 - the local private sector to participate in such collaborations.
 - setting up of teams with different expertise in biotechnology from different institutions.
 - establishment of a formal forum where biotechnologists using GR can meet, cooperate and collaborate.
 - formulating formal arrangements (MOUs) for foreign collaborative work on biotechnology using genetic resources.

[suggested: NSF has the capacity to develop the policy, but a directive from the ministry is required as NSF is not mandated as a policy making body. The actions to strengthen biotechnology using genetic resources should be identified in the policy].
- The NSF could create awareness on potential of biotechnology facilities using genetic resources among the business sector through its science popularisation programme through article in the Newsletters of the Chambers of commerce; the Chambers of Commerce/Rotary Club could organize work shops/meetings in collaboration with the NSF and Agbiotech.

- The current custodian of the biosafety database (prepared by the biosafety project) is the Biodiversity Division of MOE. The database should be made available online by modifying it for web hosting. The BDS requires funds to employ a webmaster to update and accommodate the database in the website.
[suggested: Linking up with NSF biotechnology committee, the AgBC*, to assist updating the website. There is possibility for a new biosafety division to be set up in the MOE. If so this activity can be delegated to this division].*
- There should be an apex body to coordinate the “centres of excellence” and for overall development, promotion and coordination of biotechnology matters.
- Through the Apex body, a formal forum where biotechnologists can meet, cooperate and collaborate should be established. The forum could also discuss training projects, overseas exchange visits, other opportunities, etc.).
[Suggested: MS&T could address this by incorporating it into their plans for biotechnology development].
- The Science and Technology Ministry should identify and strengthen selected centres of excellence for biotechnology using genetic material. These centres should have central laboratories with the required sophisticated equipment to fulfil conservation needs (e.g. DNA testing, characterisation of genetic resources, etc), and for sustainable use, including commercial use. These centres will need accreditation. They could also act as centres for technology transfer in an ABS regime (under Article 15, 16 and 19 of the CBD). These centres need accreditation.
 - The MS&T should:
 - make state of art facilities (set up) at these centres of excellence available for use by industry and other stakeholders.
 - strengthen existing biotech centres/institutes, (especially those not funded by the state).
 - set up bioactivity testing facilities in more than one place (centres of excellence).
 - establish teams, with different expertise in biotechnology - comprising individual scientists from different institutions - and lawyers.* (e.g. India has excellent arrangements for coordination in biotechnology and should be studied)
 - setup a legal team to offer legal advice to biotechnicians in centres of excellence and other research agencies, help draft MTAs (access agreements with external country parties) for collaborative biotechnology projects, and to deal with IPR issues, rights of inventors and assignees, and related aspects. (This could be the same legal team set up for the ABS regime at the Focal Point).
 - There should be a mechanism through which other institutions could obtain the services of these centres of excellence (advanced technology, equipment, facilities, etc.).
 - There is need to develop the biotechnology ‘centres’ that are presently functioning without any help from the State or Universities, and under extremely difficult conditions. These centres already have facilities for biotechnology research and services (e.g. the Agricultural Biotechnology Centre [AgBC] in Peradeniya, which are under utilised (i.e. as these institutions have to generate their own funds, the lack of knowledge among the private sector to avail of these facilities for business ventures is hampering their functioning to full potential).
 - There should be legal officers at the “centres of excellence” for biotechnology. If not a panel of lawyers with the required expertise could be linked with these institutions to provide legal advice on patents IPR issues as and when required.
- The capacity for the VRI to act as a centre for storage of animal germplasm should be enhanced with the required infrastructure, equipment and staff training).

[Suggested: MS&T to collaborate with the Ministry under which the DAPH operates]

- Institutions engaged in biotechnology should be provided legal advice on IPR issues, patents and benefit sharing when there is foreign collaboration (e.g. The ITI prepares its own patent application documents, and has not used lawyers for this process so far. But would benefit with assistance from experienced IPR lawyers for filing international patents).

[Suggested: the legal advisory panel for the centres of excellence could provide this expertise].

Individual:

- Human resources development in biotechnology at all levels will be required once the centres of excellence in biotechnology are established (e.g. graduate/post graduate to technician/lab attendant level).
- Training should be provided for:
 - legal officers at centres of excellence on the use of genetic resources in biotechnology.
 - patent attorneys to address IPR issues and biotechnology products relating to genetic resources on:
 - a) The gene constructs made during the course of research and the ultimate genetic constructs.
 - b) The end products (e.g. plants, animals, primers, microbes, biomolecules).
 - c) Technologies and associated technologies (divisional applications)
 - d) The rights of use
 - e) The assignment of genetic constructs and technologies to 3rd parties
 - f) The rights of inventors and assignees.

[suggested: FP with Partner organisation (e.g. EFL) can provide the training]

- biotechnology workers in research institutions and centres of excellence on legal aspects/IPR, drafting MTA.
- relevant personnel on benefit sharing and negotiation skills.

[suggested: MOE/BDS/FP on ABS to collaborate with MS&T/NSF, EFL, individual experts on ABS].

- Scientists carrying out biotechnology research using GR should be provided opportunities for short term training /visits overseas, and for foreign scientists come here through exchange programmes and study visits. This should also be built into the policy.
- Scientists involved in biotechnology using genetic resources should be provided with:

(a) Negotiation skills:

- for effective negotiation of technology transfer, IPR and benefit sharing from collaborative arrangements using indigenous genetic resources with external country Parties and their representatives.
- international trade/marketing negotiation.

[Suggested: Apex Body with partner organisations (e.g. ABS FP, NSF biotechnology committee, MS&T and EFL) can provide the training. Skills building for negotiation need special expertise].

(b) Administrative skills

- Training/capacity development of administrators (including research directors) on interpreting government procedures to minimize problems and delays with the tender procedures.

[suggested: FP with Partner organisation (e.g. NSF biotechnology committee and MS&T) can provide the training]

(c) Proposal writing skills and skills for conceptualizing the work at hand

- Training workshops are required for biotechnology research scientists to enable them to access more funds.

[suggested: FP with Partner organisation (e.g. NSF biotechnology committee and MS&T) can provide the training]

5.5 Establishing an effective inter-institutional coordination mechanism for identification and monitoring of critical components of biodiversity and threats to biodiversity

Addresses Article 7(c) and also addresses some aspects of Article 8(h)

● *This is a cross-sectoral issue relevant for all three Rio Conventions.*

BOX 5.5

Enhancing capacity for monitoring threats to biodiversity

The CBD requests parties to identify processes and categories of activities which have, or are likely to have, significant adverse impacts on the conservation and sustainable use of biological diversity, and to monitor their effects through sampling and other techniques (Article 7 (c)). This is a priority need, especially in respect of preventing the introduction of, and controlling or eradicating alien species, which threaten ecosystems, habitats or species (Article 8(h)) as well as stemming other destructive processes and monitoring development impacts on biodiversity (i.e. monitoring action to see whether they comply with the EIA requirements).

Hence establishing an effective and coordinated mechanism for identification and monitoring of critical components of biodiversity (i.e. for conservation and sustainable use) and major threats to biodiversity is essential for the main state institutions responsible for biodiversity conservation and management (e.g. FD, DWLC, DFAR, CEA, NARA, CCD, DOA, BG, NZG, etc.). This is also a prerequisite for the use of scientific facts for management and policy formulation by high-level policy makers. This has also been emphasised in the BCAP. During preparation of the addendum to the BCAP it was revealed that monitoring mechanisms were still poor. Hence the need for capacity building was examined at a roundtable meeting on *in-situ* and *ex-situ* conservation to promote the ecosystem approach. The outcome of this meeting showed that this was a priority capacity building requirement, and one that can be done with little financial investment.

The FD, DWLC, DOA have a good field presence and could take the lead role in institutionalising a simple system of continued reporting of perceived threats to biodiversity with the inputs of regional and field staff.

The status of action taken for identification and monitoring of biodiversity and threats is given in Annex 5.5. The need is to institutionalise a regular system of monitoring and reporting rather than project based mechanisms as has been happening previously.

● Overall priority capacity needs for and possible interventions

Table 5.10: Specific capacity building needs for monitoring status and threats to biodiversity

Problem/issue	Capacity building requirement and possible interventions
No regular system exists for identification and reporting threats to biodiversity in areas outside the jurisdiction of the FD and DWLC.	Systemic A coordination mechanism is required to report back threats to biodiversity from the field to the FD, DWLC, MPPA and DOA/SSPPC. [BDS/MOE to address via Task Force on <i>in-situ</i> and <i>ex-situ</i> conservation].
MPPA has especially very low capacity for monitoring threats from marine pollution at present, although it is mandated for this activity and for mitigation of threats.	Institutional Once a coordination mechanism is established, field and regional staff in the CCD (Coastguard
While there have been major surveys for	

Problem/issue	Capacity building requirement and possible interventions
identification and recording of biodiversity in natural forests, such expertise has been obtained from specialists outside the FD and DWLC via donor funded projects. Hence there is low capacity within the two departments for continual surveys of this nature to be carried out by field staff. (Capacity built within the departmental staff could be linked to the national Herbarium and the National Species Conservation Advisory Group (NSCAG) to assist with updating the departmental databases. This expertise could be offered to other institutions such as the CEA). <i>[Note: There is a Memorandum of Understanding between the NBG and the Botany Department of the University of Peradeniya for monitoring and survey programmes. Such Partnerships could be built by other institutions for regular survey of biodiversity].</i>	division, regional and field staff), DFAR and MFAR (fisheries inspectors, fisheries coordinating committees), CEA (Divisional Environmental Officers), UDA (regional staff) Department of Ayurveda and other relevant institutions as well as NGOs with field presence can assist with monitoring threats to biodiversity. These departments could report threats to the DWLC, FD and DOA. FD, DWLC CEA and DOA could take lead role to institutionalise a simple system of reporting perceived threats to biodiversity by the field staff in their departments (from regional to head office). A circular could be sent to field/regional staff of the FD, DWLC and DOA (especially the PGRC) to their regional offices to initiate this process. <i>(This requires no additional funds)</i> Individual Training field staff in FD, DWLC, CEA, and DOA and national NGOs with field presence is vital to build skills for: • identification of species to report critical and threatened components of biodiversity and perceived threats. • identification of important/endemic and invasive plants by building para taxonomic skills. • preserving species to be sent to the relevant institutions for further identification. • obtaining spatial information using GPSs. • Identification of alien species on a case by case basis. Special training for field staff in FD and DWLC: • Training on field survey and identification of species of flowering plants and vertebrates. <i>Establishing these training programmes requires funding.</i>

Problem/issue	Capacity building requirement and possible interventions
Although the Department of National Museums should be playing a major role in identification of critical components of biodiversity (in terms of its mandate), survey and inventorying, and reporting on survey results, there is very little capacity within this department to carryout these vital functions. No capacity building relevant for biodiversity conservation has been done in the past in the natural history division of the Department of National Museums. While there are some motivated individuals, the lack of funds, expertise and focus within the institution as a whole to play a major part in scientific investigation and documentation of national biodiversity has precluded the National Museums Department in playing a major role in this area as it did during the first half of the 20th century.	<u>Capacity is lacking at institutional and individual levels.</u> A complete review of the intuition's objectives and mandate, and the existing capacity to fulfill its mandate is required for the natural history section. Staff should be trained in: Scientific field surveys, use of GPS, identification, data entry, database development, taxonomy, preservation of specimens, labeling, report writing, writing scientific papers, communication and education, proposal writing and monitoring and evaluation of activities and educational activities. <i>[Suggested: BDS/MOE to facilitate action within the National Museum's department via Task Force on in-situ and ex-situ conservation].</i>

5.6 Promoting biodiversity information management and exchange

Addresses Articles 7(d) and 17

- *This is a cross-sectoral issue relevant for all three Rio Conventions.*

BOX 5.6

The CBD and the importance of information exchange

The CBD takes particular note of the importance of organising and managing information derived from identification and monitoring of various components of biodiversity as required for conservation and sustainable use (Article 7(d)). This also requires that parties extend their scope for disseminating information that has been stored for use by various categories of persons engaged in biodiversity conservation and sustainable use. This also underlies the ability to use data for planning biodiversity conservation as required under Article 6.

The CBD also places emphasis on Exchange of Information in Article 17 by requesting Contracting Parties to facilitate the exchange of information, from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries. The information to be exchanged includes results of technical, scientific and socio-economic research, as well as information on training and surveying programmes, specialized knowledge, indigenous and traditional knowledge and in combination with the technologies referred to in Article 16, paragraph 1. It shall also, where feasible, include repatriation of information. Hence developing countries need to have capacity to benefit from Article 17.

Previous capacity building in the FD, DWLC, CCD, DFAR and NARA through various projects has addressed database development and training of database managers. A mini-workshop to discuss the needs under Articles 7(d) and 17 as well as institutional visits provided inputs to identify the capacity to fulfil obligations under Article 7(d) the benefit under Article 17.

This deals with the capacity to design, develop, share, maintain and manage relevant information and data management systems to support biodiversity conservation action within the country and be able to access biodiversity information from external sources.

Managing information and dissemination at in-country level as well as enhancing access for Sri Lankan scientists and the public to external information sources for use in biodiversity conservation and sustainable use, requires capacity building at systemic, institutional and individual levels to collect, supply and ultimately use information for conservation of biological diversity and the sustainable use of its components. This requires staff training, providing equipment and enhancing coordinated action at the national and sub-national levels to cover biological inventories, collections of specimens, *ex-situ* conservation facilities, etc; and creating and managing databases and meta-data bases. It also requires disseminating information derived from databases in a usable form (i.e. customised information) to scientists, policy makers, general public, and national or sub-national biodiversity information monitoring/coordinating centres. Enhancing capacity for information exchange may also require development of policies, programmes and mechanisms to create meta-databases on national (and sub-national) biological inventories, information on collections of specimens, *ex-situ* conservation facilities, etc.

It is also well known that many Sri Lankans, as in other developing countries, find it difficult to access information on research findings and technological development that is vital for conservation and sustainable use of biological resources. Most scientific journals are out of reach of **individual researchers** due to high prices of these documents and the high cost of surfing the internet precludes access to journals via the internet.

Table 5.11: Enabling environment for information management and exchange

Status of databases and information networks
BDS: A comprehensive survey and requirements for a meta-database was carried out by the USAID/NAREPP project during preparation of the BCAP in the mid 1990s. This could be used as a base to establish the biodiversity meta-database. The National Biosafety Framework Project carried out by the MOE has undertaken a comprehensive survey of biotechnology capability in Sri Lanka (amongst other actions) and this information is available in a database. The BionetAsia information network has been established for harmonizing biosafety activities. FD has a comprehensive database (EIMs), and data management system (with GIS). Forest areas have been mapped through various projects using GIS. This information is available in the FD database. EIMS database contains comprehensive data on woody plants gathered through the National Conservation Review of natural forests (NCR). The NCR data also covers (though less comprehensively than the woody plants) some vertebrate and invertebrate groups. This database has recently been made more user-friendly through the FRMP project. This FRMP project has also provided equipment and facilities for database development. DWLC is developing a National Biodiversity Database (with GIS) and carrying out baseline surveys and habitat mapping through the PAM&WC project. Data from this will be incorporated into a database. This project has also strengthened the GIS unit of the DWLC to help strategic planning and improvement of park management. CEA library is the focal point for Envinet (Environmental Information Network). LAN facilities are available here. This is linked to the various divisions of the CEA for information exchange. The CEA also has GIS facilities and a digital database on wetlands with digitised maps. MPPA has a database on environmentally sensitive marine areas (mapped using GIS) via the INSCOM (Institutional Strengthening of Oil Spill Contingency Management Project - Phase 1). However, critical areas such as coral reefs, sea grass beds have not been mapped (Source: MPPA), and this is perceived as a major deficiency by MPPA. NARA has several databases set up on various aspects of coastal biodiversity. There is specifically a meta-database for coral reefs, developed by GCRMN and NARA. The publication is made available in CD form and can be accessed through the NARA website. CCD has set up a GIS unit with a database on coastal habitats (with GIS/GPS facilities/equipment) to help the department's functions and the decision making process for integrated Special Area Management (SAM) Planning in the coastal areas; conservation and mapping of coastal habitats and sites of archaeological, historical and scenic value; erosion management; controlling coastal water pollution and identification of coastal land use patterns' and identification of sites for future development. CCD has a problem of getting information from other institutions because of the cost involved in accessing information, although this is relevant for coastal zone management. MFAR: Database development and a system of information sharing and networking has been set up for institutions under this Ministry through the IS

Status of databases and information networks

component of the CRMP.

PGRC: A central database on genetic resources for food and agriculture (including medicinal plants) is being established at the Plant Genetic Resources Centre (PGRC), under an FAO project. The software has been provided on the basis of providing the information to the donor. The database will be shared with the DOA and its network of institutions. Through the GEF funded 'In-situ Conservation of Crop Wild Relatives through Enhanced Information Management and Field Application (now endorsed) is envisaged to have linkages with 11 stakeholder institutions (including the DWLC, FD, DOA Dept. of Ayurveda, NBG, universities, etc.). The stakeholders should discuss and decide as to what data they have and formulate their individual data sharing policies.

SCPPC under the DOA: Online facilities are very inadequate.

Open University has network facilities with four regional centres and 18 study centres. The OU library is digitised and can be accessed through the website. Educational materials for reference are available for a membership fee of Rs 100/= per month. OUSL has Intranet facilities.

CARP is the national focal point for Agrinet. While much work is being done to disseminate information, the available facilities are inadequate for the varied functions of this database. The library has several databases and abstracts as well as full articles from specific journals. This is made available for the NARS system and for university students. **The CARP database is updated annually with current research projects and fields of specialisation by collecting data from NARS institutions. This is done through nominated focal points in each of these institutions who are responsible to provide the relevant information to the 'information coordinator' at CARP.** CARP provides training on coordination to the focal points via two training sessions annually and the required software is installed in the member libraries. CARP also carries out awareness programmes for the scientists in the NARS system on the data available on agriculture, carrying out internet searches, etc. on an annual basis. The absence of LAN facilities at CARP (which was available earlier) is a serious constraint.

ITI has a LAN database to collect all research carried out within the institution, and a website, but has no data-sharing links with other institutions.

NSF has a National Science Library and Resource Centre (formerly the Sri Lanka Scientific and Technical Information Centre (SLISTIC). This is the focal point for the dissemination of information on science and technology. At the national level an information exchange system has been setup via the Sri Lanka Scientific and Technical Information Network (SLISTINET) which now has a membership of over 100 libraries including universities, research and development institutions and NGOs. SLISTINET members have access to the internet and CD-ROM databases through the NSF. Science direct (WWW.sciencedirect.com) can be used to access databases on scientific publications such as Blackwells, Emerald, etc., through NSLRC. NSF also conducts courses for SLISTINET members on more general topics such as information management, time management, etc. conducted by local and foreign resource persons, but this is not done on a regular basis. NSLRC also offers database development and training on library management systems using CDS/ISIS library software developed by UNESCO. NSLRC has several databases: SLISTICAT (on scientific books, reprints, reports, periodicals etc.), SLSI (scientific articles in local journals), RGRA (final reports of research projects supported by the NSF). The NSLRC/NSF has access to internet through a lease line, and this resource is offered to the scientific community through a membership scheme. NSLRC has web-hosting facilities for S&T institutions and acts as a nodal point for the Lanka Education, Academic and Research Network (LEARN) established by the Universities.

5.6.1: Promoting in-country biodiversity information management and exchange

Addresses Article 7(d)

This deals with data collection for database entry, and data organisation and dissemination to promote biodiversity conservation and sustainable use. Due to liberalised policies of information exchange, and strong bilateral and multilateral links with regard to funding for environmental conservation, Sri Lanka has good possibilities of collaborating with other countries to improve access to environmental information. These capabilities need strengthening further.

● Overall priority capacity needs and possible interventions

Systemic:

- There is no national policy on biodiversity information management, and no national policy for access to GIS information in the country.
- Accessing biodiversity information in custodial institutions is difficult. This is because officials in custodial institutions are reluctant to provide information as they are not sure whether the information is publicly held and could be given out freely. There should be clear guidelines, laws and regulations at systemic and institutional level on access to biodiversity information.
- Information safety and IPR issues are poorly known and not adequately addressed at the national level.
- There is no central meta-database which provides information on where biodiversity data can be accessed.
- All publications and journals should even now be customarily sent to the national archives and the national library. However, compliance is low as there is no law or policy to send information to the national archives.
- Resource managers and policy makers do not get timely information on biodiversity in a useable form to make sound decisions for biodiversity management.

Institutional:

- There is no central national body responsible to provide and distribute biodiversity information (particularly information from COP to the CBD).
- Most custodial institutions lack human resources (in terms of numbers and personnel with skills) and funds to establish and maintain computerised databases, and have very limited means to collect information from original data sources/repositories.
- Some institutions lack relevant IT facilities (e.g. LAN).
- Databases developed through projects funds located in biodiversity information custodial institutions are not regularly updated and managed after the projects end due to insufficient funds and staffing (i.e. databases are set up and managed by project staff, who are sometimes not absorbed into the permanent cadre). Databases are often setup through special projects, but financial resources and staff for maintaining and updating the databases are not given due consideration in the project proposals.
- Custodial institutions have data in various forms. For example, the National Herbarium has data as herbarium sheets which are not yet digitised. (this is to be addressed). The National Museums has data in the form of specimens.

- NGOs lack funds to obtain up-to-date publications on biodiversity. They also lack funds, equipment and infrastructure for easy internet access. Many rely even now on telephone calls for networking.
- Often there is no transparency for information sharing between the different divisions of a single institution. This is partly due to poor research ethics and the threat of data plagiarism.
- There is no regular mechanism or institutional policy for sharing published information within and between custodial institutions.
- Many published and unpublished reports/research papers are not mentioned in the institutional annual reports. Reports on university annual conferences and sessions are often not accessible for reference by scientists and resource managers.
- Setting up databases is generally not difficult and the software is easily accessible. However sound procedures for database designing, management and upgrading are absent in many institutions. Accepted procedures for data inflow which facilitate database updating are particularly deficient in most institutions.
- Capacity building through partnerships between organisations (between both inter and cross-sectoral institutions) is greatly under-utilised for dissemination of biodiversity information.

Individual:

- Database managers in custodial institutions often do not get the required support from the top institutional management, partly because databases management is under-valued.
- The staff managing databases require training on data collation, management and dissemination in customised formats (including communication and writing skills).
- Database managers have little knowledge of the legal aspects of information dissemination (patent rights, disclosed and undisclosed information, etc.).
- Officers in custodial institutions lack capacity to identify the type of information that is in the public domain, and what is not.

Possible interventions:

Systemic:

- There should be a national policy on biodiversity information management, and a national policy for access to GIS information in the country.
- There should be institutionalized systems to coordinate monitoring of biodiversity in forests, wetlands and coastal and marine areas and for collation of the resulting information. (*see section below on identification and monitoring*).
- Special projects which set up databases should allocate financial resources and funds for staff to maintaining and update databases.
- There should be an in-built mechanism during major donor funded project formulation to specify that staff trained through projects to develop and manage databases should be absorbed into the permanent cadre of relevant departments; or existing departmental staff should be released to work on database development through projects. This could ensure that the training is not wasted and database management can continue as desired after the project ceases.

Institutional

- It is expensive to maintain and update individual databases in state agencies on all aspects of coastal/wetland/or forest biodiversity. Hence there should be a mechanism to link up sectoral databases to make the relevant data accessible for state departments within the sector for informed decision-making. However, custodial institutions could maintain data ownership and data access policies which are addressed in a biodiversity information policy. An inter-institutional mechanism that has consensus of all stakeholders should be identified and established.
- Sectoral data should be gathered on a common format (if possible this should be extended to other related sectors).
- All biodiversity related databases should be linked to a central biodiversity meta-database to be set up at the Biodiversity Secretariat of the MOE. *[This needs funds and human resources]*.
- Centres of Excellence for biodiversity information should be identified. These centres could disseminate information on the biodiversity data available in the country, the custodial institutions that own the data, and how they can be accessed according to institutional policy. This could be made available through a special website. Institutions such as the NSF and other centres of excellence for biodiversity could link with the BDS to make the meta-database accessible through their web portals (to be accessed with greater ease by relevant information seekers).

Table 5.12: Specific capacity development interventions to promote biodiversity information management and exchange

Systemic	Institutional	Individual
A National Policy on access to biodiversity information is a critical need. This policy should: • address specific guidelines on action against misuse and penalty for misuse; • specify accessible information and restricted information (to be determined at the institutional level); identify criteria for collection, management and storage of biodiversity information. • give guidelines to assist custodial institutions to formulate individual information access policies for in-country and external would-be users; • specify that all state institutions send published information relating to biodiversity to the national archives as well as to the NSF which is the national repository for science and technology.	A central meta database on biodiversity information should be established at the MOE/BDS with a mechanism for regularly maintaining and updating the meta-database. <i>(A comprehensive survey and requirements for a meta database carried out by the USIAD/NAREPP project during preparation of the BCAP could be used as a base to establish the meta-database).</i> <i>(Note: A guide to national institutional survey and networking in the context of the CBD has been prepared by WCMC)</i> The meta-database should specify accessible information and restricted information at the institutional level. Develop the 'Centres of Excellence' for biodiversity information to help make the BDS meta-database accessible for users (through their web portals). The BDS/MOE (hosting the meta-database) should develop a system to facilitate the updating of the allied databases and have documented procedures for data collation and updating.	Awareness programmes should be held by Centres of Excellence' to make stakeholders aware of the availability of biodiversity information. <i>[suggested: NSF and CARP, in collaboration with the BDS]</i> <i>BDS staff needs capacity building to set up the meta-database.</i>

Systemic	Institutional	Individual
• promote measures to enhance technical capacity for collation of information on Sri Lanka's biodiversity <i>[BDS to link with NSF and CEA and CARP]</i> • Help expand the operational language of databases to cover Sinhala and Tamil as well as English where possible and relevant.	<i>[The procedure to be followed by the PGRC and the procedures followed currently by CARP should be reviewed and adapted in this regard].</i>	
<i>[BDS to link with NSF and CEA, and CARP; the NSF could coordinate this activity of policy formation for the BDS on request].</i>	Build capacity within individual custodial institutions to collate, manage and disseminate biodiversity data as required for planning and managing biodiversity in the most appropriate form, using current computer technology and software. There should be a review of institutional staff requirements in all major custodial institutions and relevant staff training provided.	Staff training at institutional level should include: • data collation techniques, • developing questionnaires to extract specific information, • entering different kinds of data that are specific to the individual institution (e.g. certain types of data are highly specialised and need special skills for entering into the database. e.g. herbarium sheets, specimens, etc).
	Individual custodial institutions could have their own databases, but link up with the central meta-database. Key custodial institutions should be identified as centres for various types of data (e.g. FD, DWLC, CCD, PGRC, CEA, CARP, NSF; CEA should have database on information relevant to environmental Acts/ laws etc.). Custodial institutions should: • formulate criteria to provide access to information for different categories of users. • setup online nominal payment systems (there could be limited access to information according to different categories of users). • formulate Institutional policies for data sharing based on client categories.	

Systemic	Institutional	Individual
	• set up a monitoring mechanism for database management.	
	Custodial institutions should have a specific IT unit capable of efficient information management serviced by trained staff. These IT units should have access to a legal officer in the institution for advice on legal aspects of information sharing. Custodial institutions should develop and establish intra-net systems whereby each division within the institution can update their information and provide this to the main web-page/database of the institution.	Managers of data management units should have training in: • public relations and communication skills, • negotiation skills for benefit sharing, and • IPR and legal aspects of information (patent rights - on information, disclosed and undisclosed information, etc.) Data entry operators/managers should have: • the correct attitudes to learn application of different soft ware for different data bases. • educational qualifications in science (a science degree with science background) and basic computer knowledge. They should receive training to: • enhance communication skills (reporting, providing customised data, etc) • training in special software operating systems.
There should be a policy to ensure that research data gathered in government departments by officers as part of their official duties to be published within a specified time frame, either in institutional, other local publications or in international journals.	Opportunities for publication of institutional data should be provided.	

5.6.2: Enhancing access to biodiversity related information from external sources

Addresses benefiting from and complying with Article 17.

This is also relevant to fulfil all the other Articles of the CBD (6-20).

This deals with information required to promote conservation and sustainable use of biodiversity and relevant environmentally sound technologies from external country sources.

- Article 17 of the CBD requests contracting parties to facilitate information exchange from all publicly available sources. However, for Sri Lankans the difficulty of accessing biodiversity information in the public domain is a secondary problem, whereas the main problem is for accessing information that is not available in the public domain from external country sources. Examples are reports/articles in international journal which are not available free of charge online; these journals/publications are also very costly to purchase and the cost of surfing the net is prohibitive (due to telephone charges) for the average scientist or student in the country.
- Infrastructure facilities and funds are also not adequate in most institutions (especially for NGOs) and for individual scientists to access information from external sources through the internet.
- The issue of restricted access to information is also not very well understood among institutions and individuals.
- Many of the gaps identified for in-country database management are applicable for this aspect as well (and *vice versa*).

Table 5.13: Specific capacity development interventions to access biodiversity information from external country sources.

Systemic	Institutional	Individual
A Steering Committee on Biodiversity information should be established at the Biodiversity Secretariat to cover biodiversity data management, facilitate the CBD clearing house mechanism and improve access to biodiversity information from external country sources. This should have adequate mandate and power to address information retrieval from international databases. A legal expert should be part of this Committee. <i>[Suggested: appoint a legal experts and nominee from ILD of NSF and Natural Resources Management Division of CEA for this committee, amongst others]</i>	Develop the 'Centres of Excellence' - as web portals/gateways <i>[Suggested: at NSF/CEA/CARP]</i> for biodiversity information so that anyone in the country could access information through these gateways. These three centres should access information on behalf of local researchers/scientists. Enhance capacity of these centres through development of infrastructure/human resource trainings for specified needs and through the provision of financial support. There is need for an institutionalised programme to: • Publicise data available at, and accessible from, these centres of excellence for biodiversity researchers and resources managers. • make researchers aware of IPR issues so that they don't make costly mistakes.	Provide training for staff at these centres to access information.
	BDS should establish links and partnerships with the "Vidatha programme" and the CEA Regional and Sub-regional centres to form a network to enhance access to	The Centres of excellence could provide training for staff at these

	external (and internal) biodiversity related information at the remote regional levels (this could be used to disseminate information on biosafety and other relevant biodiversity information of national interest to remote areas).	<i>Vidatha</i> centres to access information. If not, the centres of excellence can give them the relevant information in a CD.
	Develop institutional links between the Centres of Excellence and external / international agencies such as IWMI, American Centre, etc. to access external biodiversity information through them.	

5.7 Implementing a multi-institutional coordinated effort to identify, design and establish a rational network of areas needing protection in accordance with the ecosystem approach.

Addresses Article 8(a) - In-situ conservation of biodiversity

Systemic:

- There is no policy to guide the declaration of areas in accordance with the ecosystem approach for protection by the various agencies mandated to do so. Some areas that are already declared as Protected under the FO or the FFPO are declared as protected by other institutions under other Acts which govern them. Similarly, some protected areas are declared as development areas by development sector institutions although they occur under the jurisdiction of agencies such as the FD and DWLC.
- There are no policy guidelines for the FD to follow if they have to declare urban forests.
- Due to the influx of funding for conservation there has been a tendency in recent years for declaration of protected areas by many organizations, without considering the feasibility of managing them. Declaration of PAs do not take into consideration the fact that local people can be seriously deprived of subsistence or livelihood use. Further, management regimes have often not been able to provide tangible benefits to local people in these areas to engage their cooperation for managing the relevant PAs.
- There is no set of national criteria that can be applied for identification of areas requiring protection by the various institutions that have a mandate to declare legally protected areas, other reserves and environmentally sensitive biodiversity rich sites. *(i.e. Scientific studies and ongoing institutional programmes show that other factors than high species diversity should be considered in the identification of a network of areas for protection. Protected areas under the FD and DWLC are currently declared based on species and ecosystem diversity and importance of habitats for species. However, other state institutions such as CCD, DFAR, CEA have different criteria for identification of sites needing protection for resource conservation and management. Furthermore, some modified areas (plantations, home gardens and paddy fields) and urban areas also have considerable biodiversity value and warrant some form of protection).*
- Protected areas are currently not declared with the concurrence of local people, which jeopardizes their subsequent management in accordance with the ecosystem approach. The problems are particularly severe in the coastal areas. The absence of a bottom-up approach to the identification of protected areas and their management, with due consideration of needs at the grass-root level is hampering the management of protected areas and other biologically valuable areas as resource conservation areas.

● Overall priority capacity needs and possible interventions

BOX 5.7

The importance of establishing a rational network of areas for protection

Under Article 8 which deals with *in-situ* Conservation, the CBD requests Parties to (a) establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity; and to (b) develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity.

The BCAP, the Forestry Sector Master Plan and the National Environmental Action Plan recognise the importance of this requirement, and recommends identification and establishment of a rational system of Protected Areas. The Addendum for the BCAP also prioritised identification of areas that may be outside the protected area system which may not warrant inclusion in the PA system due to size, etc., but nevertheless do support important and threatened components of biodiversity. Background work has been done through the NCR study, the ongoing PAM&WC project. Institutional programmes of the CCD, DFAR, CEA and DOA have also identified areas that require protection or special measures to conserve wild and agricultural biodiversity.

The enabling environment for identifying and establishing a rational system of areas for protection in Sri Lanka in accordance with the ecosystem approach is given in Annex 5.3. While many institutions have established protected areas under the laws which are applicable to them, there has been no holistic approach to identification of protected areas. Consequently, there are overlaps in jurisdiction of Protected Areas. Conversely, there are other areas that are critically important in terms of biodiversity and watershed conservation, but are not receiving any form of protection.

A high level roundtable was held to discuss the requirements to operationalise the process of identifying and establishing a rational network of areas for Protection in Sri Lanka (which would cover both natural and man-made areas, and areas with different management regimes) - with the consensus of all concerned stakeholders, taking into account the required spatial scales, and giving due consideration to relevant criteria such as preservation of biodiversity, cultural aspects, economic value, societal choice, etc. The problems and constraints to achieving this, and the existing capacity (at systemic, institutional and individual levels) required are presented in this report. Annex 5.6 gives the status of actions taken to identify and establish areas for protection in Sri Lanka.

- There is no nationally accepted approach for pragmatic zoning of areas with high conservation value for controlled resource use management, development and strict conservation, although this is vital to guide sustainable development.

Institutional:

- There is no coordinating body to take the lead in steering the identification and establishment of a network of areas that require protection of biodiversity. There is agreement that the BDS should bear responsibility for such coordination, but this unit lacks funds and human resources to facilitate the process.
- Partnership arrangements are required to help the BDS facilitate this process, but such arrangements have not been explored.
- Identification of areas for protection by scientists at the central level using a top down approach does not guarantee their protection. Getting the required stakeholder participation at regional and grassroots level to identify the sites is vital to gain local cooperation for their subsequent management. However, except for the FD, DOA, and DWLC (capacity is now being built for the latter), the required capacity to effectively mobilise public participation for major consultative process is absent in other institutions that have to declare areas for conservation and management (e.g. CCD, CEA, DFAR).

- FD and DWLC are constrained in identifying and managing protected areas because critically essential wildlife corridors between protected areas under their jurisdiction are owned by other intuitions (e.g. UDA, Plantations, LRC) or are under private ownership.
- Institutions and individuals managing protected areas are not in sufficient contact or exchanging knowledge and experiences with appropriate peers in other institutions. This is due to intangible barriers to communication within and across relevant institutions.

Individual:

- Individuals at provincial, regional, and local levels (including communities) do not have adequate skills to adopt the ecosystem approach for identifying and managing areas of high biodiversity conservation and sustainable use.
- Individuals in most state institutions responsible for the management of protected areas do not have adequate skills to effectively mobilise provincial, regional and local level support for identification of areas for protection.
- Individuals in the BDS require assistance to coordinate a major national exercise for identification of a rational network of areas for protection in Sri Lanka.

Possible interventions:

[Suggested: GEF funds to be sought to build capacity to establish a major multi-institutional initiative to identify, establish and monitor a rational network of areas for protection in accordance with the EA.]

Table 5.14: Specific capacity development interventions to establish a rational network of areas for protection in Sri Lanka

Requirement	Activity	Capacity building needs
Systemic An overarching policy is required to govern the declaration of areas for protection by different institutions under the various ministries. This policy should identify the process for selection of such areas, the forum for deciding on the areas, and a coordinating agency to facilitate and coordinate the entire process.	A strong coordination mechanism is required to drive this policy formulation and implementation process. <i>[suggested: BDS should be the coordinating body; the National MAB Committee can help facilitate the process of identification of criteria, and function in an advisory and consultative role and help advice on communication/consultation aspects].</i>	Institutional/individual BDS staff lack capacity to initiate and facilitate this process. <i>[suggested: BDS should request assistance for facilitation and advice from a panel of experts knowledgeable on establishment of protected areas and the ecosystem approach].</i>
Systemic A forum is required to bring all stakeholders together to identify an optimal network of areas for protection in accordance with the Ecosystem approach. The forum should not only have participation from scientists and institutions that would manage these areas, but also other stakeholders whose cooperation is vital to operationalise the network	A preliminary meeting is required to initiate this process and identify: ● all stakeholders (at provincial, regional and local levels) for a formal national forum to implement this process, ● criteria to be used for site selection, ● existing datasets that can be used for site selection.	Institutional The entire process should be initiated and coordinated by the BDS. To build capacity, a partnership arrangement is desired to assist the BDS. <i>[Suggested: NSF/MAB national committee could start the initiative if there is a request from the BDS].</i>

Requirement	Activity	Capacity building needs
of areas for protection at the local and regional levels.		
Systemic The forum to be set up should have a mechanism to: • receive and consider areas recommended for protection from provincial and local administrators and communities and institutional scientific data. • receive inputs from scientists/resource managers for zoning the selected areas and to identify areas for strict protection.	The BDS has to convene the national forum and decide on a plan of action for the consultative process at national, provincial, regional and local levels and to finalise the criteria for selection of sites. <i>[Suggested: The MOE should use the preliminary meeting to identify a panel of experts with expertise in protected areas and the Ecosystem Approach for future guidance to the BDS - as a technical advisory committee].</i>	Guidance is required on the process to be carried out by the forum and capacity building on effective consultation processes. <i>[Suggested: As the BDS lacks capacity (funds and human resources) to convene the forum, a partnership arrangement with other agencies is desired].</i>
Systemic The final selection of sites and the category of protection awarded to them should be done with the consensus of provincial, regional and grassroots stakeholders.	Institutions that will be finally responsible for managing the selected 'areas for protection' have to spearhead the regional consultative process.	Institutional /Individual The FD, DWLC, irrigation, CEA, CCD, DOA, DAPH DFAR, LRDA and UDA need capacity enhancement funds, human resource and consultation skills to sensitise various provincial/ regional/ local stakeholders, and obtain their participation meaningfully in this process (FD and DWLC could share their social mobilisation expertise with other institutions).
Systemic Land being a devolved subject, provincial and local level administrators such as Divisional Secretaries (who head Divisional Coordinating Committees) and communities should be involved in site identification.	Community based organisations need capacity building to participate meaningfully in site identification.	Individual Local and provincial level officials and CBO representatives need training and awareness programmes on the criteria for selection and identification of areas needing protection. Capacity building of relevant individuals should precede the participation of regional and grassroots level agencies and communities.
Systemic The final identification of the network of areas for protection should be made after consideration of all information (regional and grassroots data as well as	BDS should collate existing information to help identify areas for protection. More studies are also required to build on the gap analysis done by the PAM&WC project and the NCR	Systemic Studies <i>[Suggested: by FD, DWLC, CEA, CCD, MPPA, DFAR, DOA, NBG, NZG, universities, and other field scientists]</i> to identify further areas for protection

Requirement	Activity	Capacity building needs
data available with FD, DWLC, CEA, DOA, NBG, DAPH, Irrigation Department, SLLRDC, UDA, etc.)	to fully identify areas for strict protection, wildlife corridors, controlled resource management areas, controlled development areas, and buffer zone areas. 'Ground truthing' and expansion of gap areas identified under the PAM&WC project is required. (Data from the NCR and the gap analysis of protected areas through the PAM&WC project could provide the scientific data for identification of areas for protection in keeping with the ecosystem approach.)	should be supported [Suggested: by NSF research grants]. This could lead to periodic assessment of the adequacy of the network of areas for protection and management.
Systemic Establishing a network of Protected Areas should adopt the Ecosystem Approach. This requires inclusion of areas of varying degrees of protection and under different agencies within the national network. Many of these areas would be of high economic importance in terms of fisheries, tourism and minerals.	Continued coordination of the governance of areas for protection is required to help resolve recurrent problems between various state institutions that have jurisdiction over these areas. This, as well as declaration of further areas protection (based on future studies and surveys) should be done through the main forum. The above forum should provide the coordination required between the UDA and FD for this activity. NGOs, the private sector and civil society organisations (such as the Rotary Club) could be enlisted to support the setting up of urban forests. This requires awareness creation and a consultative process by the FD to enlist the required support from partners and stakeholders.	Institutional BDS needs capacity (funds and experienced staff) to establish and sustain a forum of this nature and for its sustenance. [Suggested: This function could be taken over by a Task Force on in-situ and ex-situ conservation if set up under the BCAP implementation programme]. Individual Capacity building for consultation and consensus building is required within the UDA Landscape Division.
Systemic The policy for declaration of areas for protection should address the establishment of urban forest reserves.		Institutional [Suggested: NSF could help the FD to promote the declaration of urban forests through awareness creation and discussions via the Forestry Research Committee].

BOX 5.8

Areas to be considered for protection

Areas high in biodiversity (at ecosystems, species and sub-species levels); biologically important areas with a high level of threats to biodiversity; hydrologically important areas; modified areas (e.g. home gardens, plantations, paddy fields and urban habitats) with very rare, unique and/or endangered small populations of plants and animals -especially endemic species; coastal hot spots with multiple issues (SAM sites) and considerable biodiversity loss; areas under the existing PA system; critically important wetland habitats (including tanks and mangroves); areas rich in crop wild relatives; fisheries management areas declared under the Fisheries Act of 1996; environmental protection areas declared under the NEA; flood protection areas (under the Flood Protection Ordinance); important Soil Conservation Areas declared under the Soil Conservation Act, sensitive areas declared under the Pasture Lands Ordinance, important bird habitats, and areas with unique physical features such as river basins and isolated hills that can support high or unique biodiversity; archaeological and historical sites, culturally significant sites; biologically important landscapes and seascapes; and important animal migration routes and viable patches of vegetation between protected areas. The ecosystem approach should be applied for selection of the network of areas for protection, and an integrated approach should be adopted for management of the various sites. The selected areas should also be zoned for different management regimes by different institutions and communities.

The NCR carried out by the FD has identified the forests that should be protected to conserve a full complement of indigenous species and endemics, by sampling flowering plants, vertebrates and some invertebrate groups. The gap analysis of protected areas carried out by the PAM&WC project shows that a large number of land use categories including villages and lands under various state organization come within the corridors required for wildlife migration. This underscores the need for an integrated approach for declaration of protected areas and for their management.

(Source: NCSA workshop on in-situ conservation using the ecosystem approach)

5.8 Institutionalising participatory and integrated *in-situ* conservation and management of ecosystems as consonant with the ecosystem approach and poverty eradication

Addresses Articles 8 (c), (d) and (e) and adopting the ecosystem approach

BOX 5.9

Enhancing capacity for application of participatory management techniques

The FD, DWLC, DFAR, CEA, NARA and CCD have all been substantially assisted through capacity building projects in the past to address biodiversity management as required under Article 8 of the CBD. Although all protected areas and resource management areas do not have management plans, for many institutions this is more due to lack of funds than due major capacity gaps at systemic, institutional and individual levels. The most significant aspect hampering management through the ecosystem approach is the lack of capacity for participatory integrated management (funds, understanding and trained extension staff) in most institutions mandated with managing various ecosystems. The Forest Department has developed capacity through pilot projects at specific sites, but it too lacks resources to apply this approach on a wider scale to other forest areas.

The policies in the forest, wildlife, and coastal and marine sectors and agricultural sectors promote participatory management of natural resources.

The concepts introduced in the FSMP and the forest Policy of 1995 have been followed in the management plans for 16 wet zone forests under the jurisdiction of the Forest Department. These forests are considered of outstanding value in terms of biodiversity and watershed protection. Each of these management plans include a prescription for participatory management by the Forest Department, in which local CBOs, NGOs, and local state authorities have a definite role. Since then, several plans have also been prepared for areas managed by the Department of Wildlife Conservation, but there has been no sharing of experience with the Forest Department. As such the Protected Area management under the DWLC remained heavily biased towards regulation and law enforcement - which is ineffective. This deficiency is now being addressed under the current Protected Area and Wildlife Conservation Management Project implemented by the DWLC with ADB funds.

Special Area Management (SAM) is promoted by the CCD as a locally based, geographically specific, planning process "involving the preparation of "Special Area Management (SAM) Plans. SAM plans identify site specific problems and remedial actions, and advocate community management of resources and zonal planning for land use. This approach is further advanced in the CZMP of 2004 through more effective identification of (a) Special Area Management (SAM) sites with multiple resource use conflicts, and (b) Areas of Particular Concern (APCs) which are geographically smaller and have fewer user conflicts. However, the CCD has limited capacity at present for integrated management of SAM sites.

The CEA has recently identified and established environmentally sensitive areas and gazetted some as Environmental Protection Areas under the National Environmental Act. A new wetland unit has been established in the CEA. Many wetlands require management in collaboration with local communities and district administration. Capacity is lacking in the CEA for application of the participatory management approach.

The roundtable on capacity needs to enhance *in-situ* and *ex-situ* conservation through the ecosystem approach assessed institutional capability and identified capacity building needs to apply the pilot tested participatory management approaches more widely to field sites management by the FD, DWLC, DFAR, DOA and CCD and CEA. The outcome of the discussions on the main impediments and capacity building initiatives are presented below.

Present status:

Annex 5.7 gives the status of the enabling environment for managing natural ecosystems.

- The FD has considerably more experience in participatory management approaches due to longer experience in this field than most other state sector organisations. They also have an extension division with trained staff. There are two successful pilot projects ongoing in the wet and dry zones to identify viable models for participatory management /conservation of forests. One project has a Training of Trainers (TOT) component which is carried out by the FD and can be shared with other state institutions. However, operationalising this approach on a wider scale to other forest areas managed by the FD requires funds for social mobilisation.
- The DWLC is introducing community outreach through the PAM &WC project at a pilot level and by the establishment of a community outreach division in the department. However, considerable staff training is required to operationalise this process within the department and to sustain it after the PAM &WC ceases.
- The DFAR needs to establish community participation for implementing Fisheries Sector Management Plans to work with fisheries cooperatives and other CBOs in this regard. However, obtaining effective community participation has been a difficult task.
- The CCD was a pioneer in introducing the integrated approach to ecosystem management in Sri Lanka, but at present has limited capacity for application of this approach due to constraints of funds and trained staff for social mobilisation. Hot spots requiring participatory management (SAM and APC sites) via the ecosystem approach have been identified in the CZMP. However, issues identification, social mobilization and ecological perceptions vary from place to place and management plans have to be adapted accordingly at different sites. There are about 74 graduate recruits that have been posted at the regional level, who require training on participatory management techniques.
- The CEA has declared Environmental Protection Areas under the NEA, but there are few staff with experience of protected area management and social mobilization (note: this capacity was built through the Wetlands Projects at Muthurajawela, but these were run by project staff who -bar one- are no longer in the CEA. The ecosystem approach is relevant because some EPAs address flood retention and eco-tourism aspects - and not merely biodiversity values. CEA staff lack training on participatory management and social mobilisation. There is an arrangement for training staff at the Open University through a course on "Protected Area Management" as a strategy for capacity building. Training in participatory management techniques is relevant for Head Office staff as well as for Regional staff and Divisional Environmental Officers.
- NARA is engaged in identification of coastal ecosystems and seascapes and studying the coastal and marine ecosystems. This will involve a training of trainers programme for the community to do regular monitoring of these systems in the future. Hence a training for research assistants who will be engaged in this activity on participatory management techniques is very relevant.
- An urgent need exist to enhance participation management techniques with all agencies by tanning the technical staff instead of awaiting recruitment of external social mobilises to undertake the social mobilisation processes.

● Overall priority capacity needs and possible interventions

Systemic:

- The NEA lacks the authority of the FO and FFPO for site protection (a requisite for site management).

Institutional:

- Both FD and DWLC have inadequate capacity (i.e. mainly funds for the FD, funds and trained staff for the DWLC) to institutionalise this piloted approach by extending it to all areas under their jurisdiction. Other agencies such as the CCD, DFAR and CEA lack overall institutional capacity for habitat and resource management.
- Most institutions managing protected areas and resource management areas have not been able to adequately demonstrate tangible benefits to local people. This has curtailed community cooperation for the sustainability of these programmes and these areas.
- Divided institutional responsibilities preclude the application of integrated management of ecosystems and implementation of management plans (e.g. Solving management problems at Muthurajawela has proved difficult as it falls within the authority of DWLC, MFAR and CEA due to the absence of effective inter-agency cooperation.
- State institutions depend heavily on external donor funding for social mobilisation which is a requisite for adopting a participatory approach to protected area management. This is a main impediment for limiting wider application of this approach in the FD.
- The experience gained by the FD for participatory management has not been utilized at the national level for capacity building in other state institutions.

Capacity gaps at the institutional/individual levels:

- Resource managers (other than at the FD and DWLC) lack capacity for managing areas requiring protection. These capacity constraints are variously legal issues (lack of legal standing for CEA officials when compared with field staff of the FD and DWLC) and training for effective participatory resource management and community mobilisation (in the CCD, DFAR and CEA).
- Many stakeholders at the provincial, district and local levels associated with protected areas do not understand their values/importance and the management concepts. This requires awareness programmes and social mobilization at provincial, district and local levels.
- Capacity is lacking in most institutions to build awareness at the local level to create an environmentally sensitive constituency capable of pressurising political will to favour conservation and sustainable use of biodiversity. This is a major impediment as the application of participatory management techniques to gain cooperation from local communities is particularly relevant in the Sri Lankan context as law enforcement alone is ineffective.
- Ecosystem managers (e.g. managers of protected areas, fisheries management reserves, SAM sites, etc.) need skills for effective social mobilisation to build ownership for conservation of these areas and their resources at grassroots levels.

Possible interventions:

Table 5.15: Specific capacity development to promote wider application of the participatory approach to managing areas for protection

Requirement	Action needed	Capacity building need
Obtaining stakeholder support for integrated management of biodiversity from policy makers, provincial and local level administrators and communities in the areas identified for protection.	There are similar problems for adopting the participatory management approaches as consonant with the Ecosystem Approach in almost all institutions responsible for managing biodiversity. Hence a comprehensive integrated initiative is required to jointly train field officers in several institutions (e.g. DWLC, FD, CEA, CCD, DOA/HORDI, DFAR, NARA	Funding is required to initiate a joint inter-institutional project for the FD to build capacity by extending the ongoing AUSAID funded Training of Trainers programme to pilot sites managed by the DWLC, CCD, CEA, DFAR, DOA,

Requirement	Action needed	Capacity building need
Obtaining 'ownership' of integrated site management programmes by other institutions that should be key stakeholders. Lack of well trained and committed field staff capable of effective social mobilisation at grassroots level - among communities adjacent to the areas being managed, Divisional Secretaries, and village level administrative officers (GNs). who have to be involved in the management process. Inability to provide tangible benefits to communities through resource management, livelihood development and resource conservation. Lack of sufficient capacity for community mobilisation, social upliftment and livelihood development to enable sustainability of the programme when funding ceases for pilot projects promoting participatory management. (This is being addressed by the FD). Lack of capacity to wean away dependence of communities on project funds from the inception of the project. (This is being addressed by the FD).	and possibility UDA) at various sites, with the final objective of conservation and sustainable use of biodiversity. Each site should be used to train more staff from the respective institutions. <i>[The FD should extend the 5-module Training of Trainers programme now being pilot tested under the Sri Lanka Australia Natural Resources Management Project (SLANRMP) to selected pilot sites managed by the DWLC, CCD, CEA, DFAR and DOA/HORDI, NARA and selected NGOs with field presence. This being a continuous training of trainers programme at field level, the trained officers would be required to further train others at the respective sites for continuity of the programme.]</i> <i>This could be initiated by the MOE and NSF/MAB committee by bringing together all relevant participants at a workshop to share experiences and for identification of a suitable mechanism for preparation of a project proposal to seek funds for the above multi-institutional capacity building programme]</i> <i>[suggested: Possibility of GEF funding should be explored for the capacity building programme]</i> Community outreach training should be incorporated into the institutional training programmes of the FD and DWLC for <u>joint training</u> programmes. Special courses could be offered to site managers in the CCD, DFAR, NARA, DOA through institutional arrangements by the FD and DWLC. <i>(This component does not need additional funds and human resources, but could be carried out with existing institutional allocations).</i>	and NARA (for community outreach areas where NARA is active), and for selected NGOs with grassroots presence. Divisional Secretaries and community members should be given opportunities for study tours overseas through participatory management projects. <i>This has proved to be a successful method of obtaining the required awareness and cooperation from regional and local administrators and communities, as seen through the CRMP project (source: Stock take baseline survey).</i>

5.9. Enhancing institutional capacity for *in-situ* and *ex-situ* species specific conservation, by promoting recovery of threatened species and sustainable use of commercially important species as consonant with the ecosystem approach

Addresses Articles 8 (c,d & f) and 9.

BOX 5.10

Enhancing capacity for conservation of threatened species

The CBD requires parties to regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use, to promote the maintenance of viable populations of species in their natural surroundings; and to promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies.

The CBD requests Parties to adopt measures for the *ex-situ* conservation of components of biological diversity, preferably in the country of origin of such components by establishing and maintaining facilities for *ex-situ* conservation of, and research on, plants, animals and micro-organisms, preferably in the country of origin of genetic resources; to adopt measures for the recovery and rehabilitation of threatened species and for reintroduction into their natural habitats under appropriate conditions; and to regulate and manage collection of biological resources from natural habitats for *ex-situ* conservation purposes so as not to threaten ecosystems and *in-situ* populations of species, except where special temporary *ex-situ* measures are required.

A large number of species among the numbers evaluated show that conservation of threatened indigenous species (especially the endemics) is of critical importance. As the MOE with the guidance of the National Species Conservation Advisory Group (NSCAG) is now engaged in drawing up species specific conservation action plans for threatened species, building capacity within the institutions that have a major role to play in bringing these plans to fruition is of priority importance. Hence, enhancing institutional capacity for *in-situ* and *ex-situ* conservation of threatened species within the FD, DWLC, DOA, BG, NZG and VRI becomes vitally important to meet the demands of species specific conservation through storage of germplasm, captive breeding, introduction and re-introduction.

These issues were addressed at a high level roundtable meeting on *in-situ* and *ex-situ* conservation to promote the ecosystem approach. The outcome of this meeting as well as inputs of individuals through interviews are included in the following sections of this report.⁷

Present status:

The enabling environment for *in-situ* and *ex-situ* conservation of threatened species is given in Annex 5.8. *In-situ* and *ex-situ* conservation of threatened species to meet the demands of species specific conservation through captive breeding, introduction and re-introduction should include identification and addressing (a) remedial measure to combat pressures from over-use of economically important species and habitat loss through captive breeding or artificial propagation, and (b) mechanisms to obtain the support of species experts from all relevant segments of society (i.e. scientific and traditional, state and private sector, etc.), research institutions and germplasm conservation centres and universities in a manner that is also consonant with the ecosystem approach to biodiversity conservation.

⁷ The questions addressed were what measures are required to combat pressures from over-use of economically important species and habitat loss through captive breeding or artificial propagation? What mechanisms are required to obtain the support of species experts from all relevant segments of society (i.e. scientific and traditional, state and private sector, research institutions and universities)? Does the relevant technical capacity exist? Are policies adequate? Is the existing infrastructure sufficient? Are individuals in contact and exchanging knowledge and experiences with appropriate peers to further *ex-situ* conservation which supports the ecosystem approach to biodiversity conservation? Are there barriers to communication within and across relevant institutions?

While existing policies and laws are adequate for species conservation, enforcement is poor. (addressed previously). The existing infrastructure and expertise for *ex-situ* conservation of wild biodiversity to support *in-situ* conservation is also severely insufficient within the FD, DWLC, and NZG, particularly for fauna. Furthermore, relevant individuals in the state sector are not adequately in contact with appropriate peers for exchange of knowledge and experiences. There are barriers to communication within and across relevant institutions due to the lack of institutional mechanisms that promote such exchange.

There is fair understanding of threatened species and their need at the national level, and the preparation of species profiles and species conservation actions plans are underway. It is noted that there have been no major capacity building initiatives for *ex-situ* conservation of indigenous fauna or for the rehabilitation of captive animals (that are breeding profusely) for possible release into the wilds at the NZG. While technical capacity exists among individual species specialists in the country, this resource is not fully utilised to support the state institutions mandated with *in-situ* and *ex-situ* conservation of wild biodiversity.

● Overall priority capacity needs and possible interventions

Table 5.16: Specific capacity building requirements and possible interventions to enhance conservation of threatened species through *in-situ* and *ex-situ* conservation

Specific problem/issue	Capacity building and possible interventions
There is need for better communication and coordination between <i>in-situ</i> and <i>ex-situ</i> conservation institutions. Clear decisions on the species to be conserved by <i>ex-situ</i> means should be taken by institutions such as PGRC, NARA, National Botanical Gardens (NBG), and National Zoological Gardens (NZG) in collaboration with the relevant <i>in-situ</i> conservation institutions (FD and DWLC).	Systemic A policy on <i>ex-situ</i> conservation and a coordination mechanism between <i>in-situ</i> and <i>ex-situ</i> conservation institutions. [Suggested: The policy should be formulated through the BDS/MOE. The Biodiversity Secretariat (BDS) could set up a Task Force for <i>in-situ</i> and <i>ex-situ</i> conservation to implement the BCAP. This policy could be formulated through this Task Force. However, the BDS lacks funds and human resources to set up the required Task Forces. Even so, the policy can be formulated by collaborating with the NBG and NZG]. Institutional Breeding and rehabilitation programmes by the NZG should be carried out in collaboration with species specialists and the DWLC; reintroduction has to be very carefully monitored by the DWLC. This type of collaboration is lacking. The scope of the PGRC should be increased to cover conservation of germplasm of indigenous wild species other than crops in collaboration with the NBG and FD. (This should be addressed by the policy).

Specific problem/issue	Capacity building and possible interventions
The National Zoological Gardens is unable to serve as a repository of indigenous wild animal species as warranted by its mandate due to various capacity constraints (i.e. funds from the national budget, space, infrastructure and expertise to guide rehabilitation and where appropriate reintroduction of captive bred/reared protected species to their natural environments).	Systemic /Institutional There should be a policy, or mandate given to the NZG for it to convene a multi-species expert/advisory committee for <i>ex-situ</i> conservation, captive breeding, rehabilitation and reintroduction. This Committee should have persons with specific expertise on behaviour and ecology of threatened taxa in the national threatened list to help with captive rearing and breeding, and to provide advice on identification of sub-species for reintroduction programmes).
The NZG recognizes that there should be separate areas for exhibition, breeding, quarantine and rehabilitation, but acute space limitations preclude such critically important management practices.	<i>[Suggested: This could be addressed by a Task Force for in-situ and ex-situ conservation set up by the BDS to implement the BCAP].</i>
There is haphazard release of species by institutions and individuals require expert opinion, so as not to affect the wild populations.	Institutional • The NZG needs more space, trained staff to design special projects for captive rearing of threatened species (and captive breeding where warranted, such as ornamental fish species) and for research of species specific behaviour. • The NZG should be expanded into the various climatic zones selected by faunal experts. • THE NZG needs to set up a database on behavioural experts on threatened taxa. <i>[There is a list of experts on different taxa with the BDS/MOE which can be expanded].</i>
<i>Ex-situ</i> conservation should be used to support <i>in-situ</i> conservation rather than replace it, and is not the first possible option for conservation of threatened fauna - especially for developing countries such as Sri Lanka. However, The NZG regularly receives, and is overloaded with, confiscated animals⁸ that have been held illegally in capacity and injured animals comprising Protected species. However, the NZG has at present inadequate capacity (space and expertise) to handle their rearing, breeding, rehabilitation (especially injured animals).	Individual The NZG requires staff training on: • specific needs of threatened protected species (especially endemics) for rearing, breeding and reintroduction (where relevant); • Communication, education and public awareness, and • proposal writing, log frame analysis and SWOT analysis.
The NZG requires sufficient expertise to rear these protected species (e.g. territorial species have specific requirements, species food habits should be known, etc) and rehabilitate them so that they could be released into their native habitats when it is feasible.	Systemic/institutional There is a recommendation in the Addendum to the BCAP that all <i>ex-situ</i> collections should be registered via a licensing scheme with the respective agencies (i.e. animals should be registered at the DWLC) to enable monitoring of their well being. This should be followed up. (note: the licensing should not cover collections kept for commercial purposes such as zoos, or sales points). The issue of injured animals from protected species that range in home gardens should be given special consideration during any amendment of the FFPO.

⁸ Note: at present, the FFPO decrees that Protected species cannot be kept in captivity unless under special circumstances, and with the permission of the DWLC.

Specific problem/issue	Capacity building and possible interventions
Species that are not Protected species (and even domestic animals) are brought to the NZG by the police on court orders.	[Suggested: This could be addressed by a Task Force for in-situ and ex-situ conservation set up by the BDS to implement the BCAP]. Individual There should be awareness programmes for judiciary and police on protected species that are illegally held and should be confiscated (only these species should be handed over to the NZG). [suggested: PILF or EFL to initiate a programme]
There is no state institution to serve as a repository of faunal germplasm with adequate infrastructure and equipment (although capacity building within the VRI has been proposed in the BCAP in 1999). Facilities for preservation of animal germplasm is available at the Agbiotech Centre at Peradeniya, but use of these facilities have not been explored by the relevant state institutions. (e.g. AgBiotec has carried out characterization of cattle and goats).	Facilities for faunal germplasm conservation should be established with adequate infrastructure and equipment - coupled with capacity building within the VRI as proposed in the BCAP. Staff training on biotechnology and cross-breeding is required at the VRI as well as incentives to retain overseas trained staff. (these needs are not identified in the strategy for developing the livestock sector, and should be included therein). [Suggested: This could be addressed by a Task Force for in-situ and ex-situ conservation set up by the BDS to implement the BCAP]. Facilities for preservation of animal germplasm at the Agbiotech Centre at Peradeniya should be used for research by the relevant state institutions such as the NBG and NZG.
National Botanic Gardens (NBG) should be expanded to other climatic zones and play a major role in <i>ex-situ</i> conservation of threatened flora. (note: Two BGs are proposed at Hambantota (dry zone) and Awissawella (lowland wet zone).	Systemic The NBG needs mandate, policy to establish BGs in other climatic zones. (note: This would probably be obtained under the new ministry it has been shifted to). Institutional NBG needs institutional programmes, funds and human resources to enhance role in <i>ex-situ</i> conservation and sustainable use of plant biodiversity. Individual Staff training is required for propagation of indigenous species, biotechnology - including tissue culture. This has been lagging due to the inclusion of the NBG under the DOA previously (where training opportunities had to be shared with the DOA and the large number of divisions and agencies under it). Functioning under a different ministry (from the DOA) and as an independent agency as at now, suggests that this deficiency could be better addressed in the future.

Specific problem/issue	Capacity building and possible interventions
There is inadequate research on coastal and marine biodiversity to support conservation of threatened species, particularly marine mammals, and captive breeding of threatened ornamental fish and aquatic plants. NARA though mandated with this function, has inadequate capacity for focused research on coastal and marine biodiversity.	Institutional NARA needs a special unit to take lead role in coastal and marine biodiversity assessments, research and updating existing databases. Such a unit will have to link with other institutional databases on coastal and marine biodiversity. Funds are required for infrastructure development (research facilities), human resources (in terms of numbers and training), equipment and coordination to make a special biodiversity unit operational. Infrastructure is particularly needed for expansion of ornamental fish breeding. The technology is present at NARA. <i>[Suggested: This could be addressed by a Task Force for in-situ and ex-situ conservation set up by the BDS to implement the BCAP].</i>
The relevant state institutions may not have adequate capacity to monitor ornamental plant/animal breeding centres to identify whether the individuals held at these centres are captive bred/cultivated or collected from the wilds.	Systemic The special committee recommended for establishment under the NZG (above) could provide advise on whether commercial 'breeding farms' hold captive bred individuals or wild caught individuals.
The relevant state institutions may not have the required capacity (funds, trained people and expertise) to implement the species conservation strategies/plans and recovery plans that are being prepared by the MOE/BDS and the National Species Conservation Advisory Group (NSCAG). Some species require collaboration from the local communities for <i>in-situ</i> conservation. This requires social mobilisation and training (e. g. conservation of turtles, conservation of threatened species ranging in human modified areas). FD has inadequate expertise on conservation and management of fauna, and DWLC has inadequate expertise on flora. <i>(At present DWLC does not train foresters on faunal conservation and, similarly the FD does not train DWLC staff on floral aspects. So far any joint programmes have only been on elephants which are of concern to both departments).</i>	Individual/ Institutional NBG & NZG staff and FD and DWLC field staff should be trained for conservation of threatened species (both fauna and flora) as identified under the recovery plans and priority conservation strategies. There should be closer coordination and exchange of expertise between the DWLC and FD. Such collaborative initiatives should focus on species targeted in the species recovery plans and species conservation action plans developed by MOE/BDS. There should be curriculum development for training on species conservation measures (e.g. behavioural ecology, conservation biology, basic requirements of captive breeding, rehabilitation for release and reintroduction) in the DWLC and FD training institutes and closer collaboration between the two departments in respect of future training in this area. The possibility of extending the training courses to NZG and NBG staff (and drawing resource persons from these institutions) should be explored. Veterinary surgeons should be trained in treating threatened wild species - especially mammals such as primates that range in human modified areas. <i>[Suggested: FD and DWLC can also draw upon on the species experts in the special species committee that should be established under the NZG].</i>
There is no national plan for the Pinnawela elephant refugee to accommodate the increasing elephant population at this refuge. There is wide concern among some quarters	An expert committee is required to discuss this issue and come up with clear guidelines on whether there should be a second orphanage, whether the NZG is to stop breeding elephants or whether the captive bred animals can be given out for private use (to temples, etc.).

Specific problem/issue	Capacity building and possible interventions
when baby elephants are donated to religious institutions, etc. A national elephant conservation policy" has been proposed by the DWLC to address the human elephant conflict. There should be guidelines for the disposal of captive bred elephants from the Pinnawela elephant refugee for the Director Zoological Gardens and other policy makers to follow. This should be included in the elephant conservation policy.	<i>[Suggested: BDS/DWLC to take action on the elephant policy. This needs no additional funds or capacity building - except better inter-institutional cooperation]</i>
Implementing the species conservation action plans will require collaboration with the private sector. This has not been addressed satisfactorily. <i>(However the bonafide of the private sector organisations selected for collaborative projects should be scrutinized).</i> Much better collaboration is required between collectors, conservationists, scientists in the government sector to develop captive breeding and reintroduction of threatened species that are of commercial value. This could also prevent misuse of wild resources by collectors.	Institutional Guidance is required for relevant institutions to select private sector organizations for collaboration: • E.g. use track records and liaise with formal or professional well established groups such as the Floriculture Export Producers Association, etc. Systemic The policy for <i>ex-situ</i> conservation should state that any <i>ex-situ</i> conservation programme by the private sector should have a government link to ensure accountability. Awareness should be created among the business sector about the commercial scope for propagating indigenous species. <i>[suggested: this should be done through the chambers of commerce and other professional associations in collaboration with the</i> DOA, BG, FD, DWLC, AgBiotec Center, NARA NSF.
The current trade in ornamental species (especially for freshwater fish and plants) is unsustainable as wild stocks are depleted due to over-collection. The potential for developing the ornamental plant and animal trade for revenue generation to the country is, however, under-utilised.	Institutional The relevant state institutions should disseminate to the private ornamental species breeders the technology available with them (i.e. state institutions) to negate the need for frequent collection from the wild (e.g. technology to mass produce ornamental plants using tissue culture). This will reduce pressure on wild stocks. <i>[NARA has capacity to provide training on breeding ornamental fish and ornamental aquatic plants, but requires expansion of infrastructure facilities to apply the relevant technology to more species*. The NZG and NARA could jointly supply ornamental fish/aquatic plants for the aquarium trade for breeding, thus negating the need for wild collection].</i> Individual Communities need training on propagating techniques so that they can supply the exporters while making the industry sustainable. <i>[NARA is already doing this for aquatic plants and ornamental fish, but could be assisted to do so on a wider scale.</i> Intervention <i>[NARA could consider linking up with community participation programme of the DWLC, FD and DOA to strengthen capacity for such a venture].</i>

Specific problem/issue	Capacity building and possible interventions
There is inadequate knowledge among communities for domestication and cultivation of crop wild relatives with possibilities for use (e.g. for fibre, food, medicinal purposes, industrial use, etc.)	Individual Awareness creation about the potential for cultivating such species, and dissemination of seed material and crop propagation among home garden owners. <i>[Suggested: this is already addressed by the DOA, but could be popularised on a wider scale with capacity building. DOA could consider linking up with community participation programmes of the DWLC and FD for strengthening capacity to undertake such a venture].</i>
Breeding of threatened ornamental fish and ornamental aquatic plants needs better coordination with the private sector, but the bonafide of the private sector organisations for collaborative projects should be scrutinised.	• NARA and NZG need infrastructure enhancement for breeding/cultivation of ornamental fish and aquatic plants. • Capacity building is required at community level by providing training in technology for propagating ornamental plants and breeding endangered and endemic ornamental fish species. • Community training could be linked to community participation projects of the DWLC and FD (and even the CCD, CEA and DFAR) where feasible. <i>[Ex-situ conservation and sustainable use could be promoted among the relevant state institutions, communities and the ornamental fish and aquatic plant exporters through a major project. As stated at the roundtable with the private sector, the collectors could provide information on the environmental conditions for the species, the technology could be provided by NARA and the NZG, and reintroduction can be monitored by the DWLC. This way the exporters obtain an uninterrupted supply of the resource and communities (which comprise the collectors) are provided with the technology for breeding and support in marketing. This leads to sustainable use and conservation of the wild resources. <u>This type of activity can be built into a project for Training of Trainers</u> (for livelihood development) in participatory management of natural resources].</i> <i>[suggested: possibility of GEF funding for this activity should be explored]</i>

5.10 Negotiating to benefit national interests for biodiversity conservation and sustainable use at CBD COP and other global fora.*

Addresses Article 18(3) and has impact on all other articles and includes better access to the clearing house mechanism for technical cooperation.

● ***This is a cross-sectoral capacity need or all three Rio Conventions.***

Article 18 to the CBD on Technical and Scientific Cooperation has led to the establishment of a clearing-house mechanism by the Conference of the Parties for the CBD to promote and facilitate technical and scientific cooperation. The CHM was established at the CBD COP-1, but since then it has expanded to a mechanism for exchanging and integrating biodiversity information, and the associated human and technological networks. Furthermore, there are new management

approaches constantly being introduced at the global level, and promoted through the CBD COPs. As a developing country with limited resources Sri Lanka should contribute and benefit from the COP deliberations and avail of opportunities provided through the clearing house mechanism and other capacity building opportunities provided through the CBD mechanisms. This is particularly relevant in terms of gaining knowledge on new technologies for sustainable use of biodiversity, training initiatives available for Parties to the CBD.

BOX 5.11: Enhancing capacity for benefiting through the CBD

It is noteworthy that COP 8 held in Curitiba, Brazil from 23 March - 30 March 2006 had focused on several topics of crucial interest to Sri Lanka. Among these were:

- **Global Taxonomy Initiative**
- **Biological Diversity of Dry and Sub-humid Lands***
- **Forest Biological Diversity**
- **Biological Diversity of Inland Water Ecosystems**
- **Island Biodiversity***
- **Marine and Coastal Biodiversity: Deep-seabed genetic resources***
- **Agricultural Biodiversity**
 - Cross cutting initiative on biodiversity for food and nutrition
 - International initiative for the Conservation and Sustainable Use of Soil Biodiversity
 - Genetic Use Restriction Technologies (GURTs)
 - In depth review of the programme of work of this thematic area
- **Alien Species**
- **Protected Areas***
- **Biodiversity and Climate Change***
- **Access and benefit Sharing***
- **Article 8(j) and related provisions**
- **Implications of the findings of the Millennium Assessment**
- **Global initiative on Communication, Education and Public Awareness***
- **Framework for monitoring implementation of the achievement of the 2010 Target for implementing the CBD**

Sri Lanka was however unable to attend due to funding constraints. Island Biodiversity and almost all of the above areas are of high relevance for Sri Lanka. Several areas prioritised through the NCSA biodiversity thematic study were also included in the topics discussed at the COP. Among these are Access and Benefit Sharing (covering The International Regime on ABS which will probably become operational by 2012), protected areas, and deep water genetic resources. Furthermore, side events at COP 8 covered the NCSA biodiversity thematic area and the Communication, Awareness and Public Education programme which is being developed by the Commission on Communication and Education of IUCN- The World Conservation Union. There was also a general concern about the issue of implementation, and the importance of translating COP decisions on the ground.

(key topics identified for capacity building under the NCSA are in bold)

This includes benefiting from provisions under the CBD for capacity building, training and the clearing house mechanism.

● Overall priority capacity needs and possible interventions

- Due to the fact that Sri Lanka is now having a per capita income of over US\$1000, assistance for participation at COP meetings are not met by the secretariat to the CBD. Hence Sri Lanka could not participate at COP 8, and may not be able to participate at future COP meetings due to funding constraints. This is a major constraint for future implementation of the CBD, and for incorporating CBD obligations into national laws, policies and institutional programmes.

- Even when *there is* participation from Sri Lanka, the dissemination of outcomes from CBD COP is limited to a presentation made by the person attending the CBD COP to the National Experts Committee. This is inadequate as the information does not go beyond a limited number of people. The BDS acknowledges that a mechanism for wider dissemination of decisions taken at COPs would be in the best national interest, and provide greater opportunities for advancement of knowledge, skills and technical cooperation under the CBD. However, the BDS has inadequate capacity at present to make this information more widely available due to lack of funds for organising such fora, lack of skilled junior and mid level staff capable of preparing customized communication materials and reports.
- Sri Lanka benefits little through the Clearing House Mechanism established under the CBD, and very few people (at best) benefit through it. Although the CHM is operational through the web, this is not freely accessible for most Individual Sri Lankans due to the high cost of surfing the net.
- Individuals who represent Sri Lanka at CBD COP meetings would greatly benefit from skills building for advocacy and to negotiate beneficial terms at COPs.

Possible interventions:

- In view of constraints in terms of funds and human resources in the BDS, partnerships should be explored for expanding the clearing house mechanism within the country. The International Liaison Division (ILD) of the NSF can assist the BDS in this regard (source: outcome of roundtable meeting on *in-situ* and *ex-situ* conservation). The ILD could assist the Sri Lanka representative to be better prepared for negotiation at CBD COP meetings (by organising pre-departure briefings from relevant experts) and help with dissemination of COP decisions and deliberations to the wider scientific community and the general public.
- Through the NSF/ILD and the MOE Global Affairs/BDS partnership there should be the development of fora to involve and build capacity among relevant stakeholders and to get their participation at the national level for fulfilling obligations under the CBD.
- As External Resources and the Foreign Ministry are represented in the ILD of NSF, the problem of funds for Sri Lanka's participation at COPs could also be raised and perhaps addressed at this level. The MOE Global Affairs Division is already represented in the ILD. Where possible funding could be sought for a second person with expertise in key topics for discussion to attend the meetings with the MOE representative (*especially relevant when matters of top national interest which needs specific technical expertise such as legal, biotechnology, etc. are to be deliberated at the COP*).
- The opportunities for side events at COP meetings should be made available more widely and to the scientific and NGO community to enable them to seek funds and attend these fora.

[Suggested: A relevant mechanism should be set up by MOE (GAD/BDS) and NSF(ILD). This can be expanded to cover all three Rio Conventions. NSF/ILD could set up a briefing meeting of the Sri Lanka representative/participant, with relevant experts, prior to departure. On the return of the delegate, NSF(ILD) in collaboration with the MOE could organise a debriefing to be followed by (meetings, seminars, etc.) to disseminate the COP deliberations to a wider audience than at present. The relevant salient actions could also be relegated to the relevant NSF research committees. This could also influence priorities for research funding at the national level. Important decisions could also be communicated to the public through SLAAS].

5.11 Enhancing communication, education and public awareness on the importance of biodiversity for sustainable development to mobilize commitment and participation for biodiversity conservation

● *This is a cross-sectoral issue for all three Rio Conventions.*

Addresses Article 13 and has beneficial impact on all other articles

BOX 5.12

Enhancing capacity for communication, awareness and public education on biodiversity

Nine of the 16 recommendations in the Sri Lanka Biodiversity Conservation Action Plan (BCAP), obtained through stakeholder consultations, relate to formal education. The means and media for non-formal education are identified as films and videos and newsletters. This is because at the time, emphasis was on education for creating public awareness rather than strategically planned environmental communication which requires the selection of relevant communication tools on a case by case basis to support specific objectives of biodiversity conservation. Environmental Communication, as is recognised today is not addressed as this was relatively new to Sri Lanka in the mid 1990s. However, sectoral awareness needs have been integrated into the recommendations under the forestry, wetland, coastal and marine systems and the private sector. Although enhancing capacity of NGOs for awareness creation (i.e. training of trainers) is recommended in the BCAP, strengthening communication ability to address sectoral and cross-sectoral issues by other groups is not addressed specifically. An overall deficiency is that communication in its broader role has not been not addressed directly.

The Global Initiative on Communication, Education and Public Awareness (CEPA) is seen as an important element to achieve the objectives of the CBD. The IUCN Commission on Education and Communication is a key partner to implement the CEPA work programme of the CBD Secretariat. A CEPA toolkit is being developed by IUCN in partnership with the Secretariat. Participants at CBD COP 8 have provided a series of arguments as to why CEPA is a crucial instrument for the Convention, and have stressed the need for financial support and training to implement the priority activities of this Work Programme in Parties to the Convention. They have also urged the Secretariat to explore GEF funds and other financial mechanisms of the Convention to support Parties that are implementing the CEPA strategies.

● Overall status, priority capacity needs and possible interventions through formal education

Some of the deficiencies pertaining to environmental education in schools were addressed in the late 1980s and early 1990s through initiatives by NGOs and the government on a pilot scale. Major projects for teacher training on novel participatory methods and production of supplementary teaching material were carried out by March for Conservation (an NGO), the Natural Resources Energy and Science Authority (now the National Science Foundation or NSF) and the Coast Conservation Department in collaboration with the National Institute of Education (NIE). These "pilot programmes", though successful at the time, have not led to the establishment of national level teacher training programmes for environmental education which was, and is, urgently needed.

The National Institute of Education (NIE), as the main institution concerned with curriculum development within the school system, incorporated environmental topics into the primary and secondary school curricula during the late 1970s through a multidisciplinary approach. Most teachers in rural areas welcomed this approach rather than teaching it as a separate subject⁹. Environmental topics, including biodiversity, are addressed through the subjects of science, social

⁹ Dela, J D S (1991). Report on workshop series to identify problems and constraints to environmental education at school level. Natural Resources, Energy and Science Authority (NARESA) and March for conservation (MFC). Unpublished.

sciences and health education from years 6-11 and as a separate subject from year 1-5. At the collegiate level, there are special units covering the environment.

The younger generation is therefore knowledgeable about biodiversity and related issues, but even after nearly two decades of exposure to these topics, most students do not have "skills, attitudes and values" for biodiversity conservation and sustainable use. Environmental education in schools is mostly a mere academic exercise. This is in contrast with the goals the education department had in mind when incorporating environmental education to the formal education system.⁵

Systemic level:

There are no national level teacher training programmes to disseminate participatory methods of environmental education within the teacher training centres and their curricula.

[Suggested: the Biodiversity Secretariat (BDS) could set up a Task Force for Communication, Education and Public Awareness to implement the BCAP through which this could be initiated. However the teacher training colleges would not have the capacity to support this. Hence capacity should be built before commencement of such a venture through a national level project. There are currently no NGO partners with the necessary expertise to carry out such a project. The NZG is a possible partner for such a project as they have a staff of 10 devoted to education, who are however, new recruits with little skills training].

Institutional level:

- There is a dearth of trainers who are skilled in (or even know about) participatory methods of environmental education in the teacher training colleges. This capacity should be built before any major teacher training initiative.
- There is no national institution at present with relevant expertise that could take a lead role in promoting environmental education using non-formal participatory techniques within the school system.
- There is a dearth of adequately trained in-country "trainers" with the required proficiency in participatory environmental education techniques who could effectively liaise with the state teacher training institutes. Teacher training colleges lack skills to mobilize the available expertise.
- There is a dearth of well equipped field centres, with trained staff, where students can obtain hands on experience and knowledge about the natural environment. As far back as the 1970s, the government had set up several field centres, but it is doubtful whether they are functioning effectively at present. However, there are several visitor centres now being established in different climatic zones in Protected Areas under the FD and DWLC. These centres could be used as field centres for the various regions.
- Many schools lack equipment such as a computer, multimedia or television set to make the lessons interesting with audio-visual aids. Downloading material from the internet is prohibitively expensive for most state schools even if they have the facilities.
- There are no up-to-date and accurate supplementary material in the national languages to enhance classroom teaching. Some documents that have been prepared to increase environmental knowledge have grave technical errors and give incorrect information.
- Teachers at secondary (and even junior secondary) level in the larger schools have little time to engage in innovative participatory methods (even if they had the skills) as the school syllabus is very wide. This leaves little room for activity based education or use of supplementary educational material.
- Several environmental NGOs carry out environmental education programmes in schools on request. However, most are cursory initiatives consisting of a lecture or slide show. Such methods are found to be limited in scope for long-term attitude building among school children. There are very few NGOs (if at all) with skills in participatory environmental education techniques. A few NGOs promote field based activities through nature clubs and field projects. However, participation in these groups are limited to a fraction of students in a given school.

The Wildlife and Nature Protection Society has over 300 nature clubs in schools island-wide. State institutions such as the Central Environmental Authority have special programmes that target schools through the formation of "Environmental Pioneer Brigades". The Forest Department, Coast Conservation Department, the Department of Wildlife Conservation, the NZG and the NBG carry out awareness programmes on biodiversity and have prepared educational material through various projects from time to time. While the communication aspects of environmental education through the formal education system may not have had the desired results in full - a change of attitudes among students which will permeate into the adult sections of the public with time, it has contributed towards an adult society that is fairly knowledgeable about species and habitats.

- Many state institutions concerned with biodiversity conservation (FD, CCD, DWLC, DEOs of the CEA) carry out schools' environmental programmes via lectures, slideshows and film shows on request. However they too lack trained personnel who have been exposed to innovative participatory (activity based) educational methods that are now in use in other parts of the world. Most environmental education programmes rely only on conventional lectures which are known to be limited in scope for attitude building among school children.
- There are often inadequate opportunities for meaningful student involvement in activities that could lead to attitude building for biodiversity conservation due to the pressures of an excessively exam oriented syllabus.

Individual:

- Teachers who have to teach environmental concepts, lack skills for participatory approaches to effective biodiversity education that will create the desired behavioural changes among students.
- There is poor motivation among teachers and school administrators to promote activity based environmental education due to the 'general scramble' to complete the exam oriented syllabus that caters to highly competitive examinations (from year 5).
- Many NGOs and state sector organizations supporting environmental/biodiversity education through the formal education system lack skills for innovative activity based participatory methods.
- There is very few individuals with capacity for participatory environmental education methods and ability to monitor and evaluate environmental education or educational material for school children.

Possible interventions:

- Institutionalizing teacher training for environmental education within the training colleges is a critical requirement. Individuals with proven skills for teacher training in participatory methods and teachers who were trained through various in-country pilot programmes and overseas training courses should be mobilized.
- The basic problems and constraints for teaching environmental education in schools (identified by MfC and NARESA⁵ in the early 1990s) should be used as a basis for designing the course as most of these problems and for identification of prevailing problems. This could be done through a questionnaire survey using the MfC/NARESA survey as a base.
- NGOs should be supported with grants and training to prepare innovative supplementary education materials in response to teachers' requests. However such initiatives should be monitored to ensure that products meet the required quality standards.
- Selected NGOs should be provided training on participatory methods (training of trainers) and on preparation of educational material and programme evaluation techniques.
- The NZG and NBG should be supported to develop supplementary educational material and teacher training programmes. Prior to this they should be provided training on participatory methods (Training of trainers) and on preparation of educational material and programme evaluation techniques.
- Private sector sponsorship should be facilitated through the chambers of commerce to set up and maintain field/vistor centres for biodiversity education and to ensure a flow of funds and continuity of the programmes. The private sector could also be encouraged to sponsor educational material prepared through the NBG and NZG. (At present there is no capacity to promote such linkages).

● Overall status, priority capacity needs and possible interventions through tertiary and professional education

At the tertiary level, universities establish their own courses independently. Presently there are 13 fully fledged universities in the island including the Open University. Several, universities such as Colombo, Moratuwa (for engineering and architecture students), Peradeniya, Sri Jayewardenepura and the Open University offer undergraduate courses with environmental topics as a component, and some offer environmental topics as a complete course unit. There are also some Masters degree courses covering environmental sciences, forestry, wildlife ecology and management, environmental engineering, environmental assessment, environmental journalism, environmental law, environmental economics, industrial environmental pollution and biodiversity conservation and management. These courses are important to broaden the knowledge base at the professional level and for building expertise in the field of environmental conservation in the country. The Open University offered a post graduate diploma course on biodiversity conservation and management for mid level officials in the CEA. This is expected to be upgraded to a full MSc course in the near future. While some of the university courses may not be up-to-date on the latest conservation approaches, many offer valuable knowledge and postgraduate training in a range of biodiversity related topics. The problem is that very few of the better students remain in the conservation sphere, as they move onto the more lucrative private sector for employment or migrate overseas (there are exceptions). Further, biodiversity education is available to students in the state universities only in the biology departments (i.e. botany and zoology), and does not reach the greater majority following courses in arts, physics, chemistry, engineering, medicine and mathematics. The Open University, however, offers biodiversity related courses for students from all academic backgrounds.

A marked deficiency is that there are no topics covering biodiversity (or environmental) considerations in the professional courses that cater to the business sector such as accountancy, banking, business management, etc. Hence many employees in business establishments have had no exposure to environmental education except at the secondary level (i.e. only from the late 1970s when EE was introduced to schools). Consequently, the private sector and development sector state officials have very low awareness about the importance of biodiversity, its economic importance and related issues. Further, there are a growing number of high level executives within the business sector who have attended International Schools that do not follow the state syllabus, and as such may not have received any form of biodiversity education.

Possible interventions:

- There should be university courses in all streams on environmental communication planning and implementation, skills for marketing, negotiation and advocacy, creative writing, and report, memo and proposal writing.

● Overall status, priority capacity needs and possible interventions to enhance non-formal environmental education through the state and NGOs sector

Institutional:

Several state organisations concerned with biodiversity conservation provide non-formal environmental education through their education and extension programmes and divisions. The DWLC, FD, CCD, CEA, NBG and NZG engage in public education programmes and have prepared educational aids such as posters, brochures, magazines and films through their education and extension services. However most of the public education programmes are broad based and geared more towards increasing knowledge and information dissemination rather than creating awareness as a first step for an attitudinal change through a communication strategy. The extension division of the FD has, however, been quite successful in developing greater conservation awareness among communities living adjacent to forests where their participatory management pilot projects are in operation. The FD has also carried out well targeted and successful social mobilisation and public awareness programmes for local communities. This has gone a long way in local people understanding and appreciating forests and protected areas. In some instances this has created a commitment for conservation as well.

Most biodiversity (and environmental) education programmes implemented through state institutions are sporadic. This is mainly because much of the awareness and extension activities are carried out with project funds and the activities cease at the termination of the respective project due to financial constraints. Further, many of these programmes are broad based, lack clear objectives and targets, or are not based on an analysis of tools, means and media to reach specific target groups. In short they are not based on well planned strategic communication with clear measurable outputs. Evaluation of education and public awareness programmes is rare.

NGOs such as the Young Zoologists' Association (YZA) and the Youth Exploration Society (YES) are actively involved with creating awareness for biodiversity conservation among youth in connection with the National Zoological Gardens and the Royal Botanic Gardens in Peradeniya respectively. Both YZA and YES also carry out field studies on ecosystems and species that serve to educate and motivate young people for nature conservation. Other NGOs such as the Environmental Foundation Ltd and the Sri Lanka Environmental Journalists' Forum are engaged in generating awareness about topical issues which cover biodiversity loss. NGOs such as the Green Movement, the Turtle Conservation Project and the Organization for Resource Development and Environment (ORDE) work at grassroots level to foster public awareness. However, here again, use of strategically planned communication is not the usual practice among NGOs.

Although many NGO have programmes for generating awareness on biodiversity conservation, only a few have achieved desired goals due to lack of resource persons, materials and financial resources. Most environmental NGOs are severely constrained for funds, even when they have skills and manpower. NGOs also need updating on new approaches to biodiversity conservation. They also need to plan communication more strategically to obtain maximum results from the inputs in terms of funds and time. Environmental NGOs need skills enhancement to adopt more diverse and innovative means of creating environmental awareness, and to move away from traditional lectures and production of leaflets and brochures to park (or field) -based interpretation, greater use of audio-visual material, outdoor activity based participatory education methods and field based programmes that are strategically planned to reach specific goals and target groups. NGOs also need skills building for effective negotiation and advocacy.

Individual:

- Education and communication officers in state sector conservation agencies and NGOs, who have to conduct educational programmes, should be trained to plan customised communication and education programmes and on the use of relevant educational tools. There could be short 1 day training courses in biodiversity communication planning for state sector officials and NGO staff (as an introduction to its scope), to be followed with longer courses on request.
- Training on participatory environmental education methods is required for key national NGOs, and extension staff in the FD, field staff in the DWLC, Educational staff in the CCD and DEOs in the CEA, and educational officers at the NBG and NZG.

● Overall priority capacity needs and possible interventions to enhance public education through the mass media.

In Sri Lanka, the mass media is a very effective and efficient way of reaching a large number of people at a given time, due to high literacy rates and relatively widespread access to the electronic media. Some mass media institutions are under state control, but many are now privately owned. Thus there has been a noteworthy trend for the growth of the private sector media services in a competitive environment, which now includes the telecast of news bulletins. There has also been a significant expansion of private sector newspaper publications, including those of the "alternate press".

Even so, the potential to use the mass media as a vibrant tool to promote biodiversity conservation and public education is low. This is mainly due to the lack of understanding and awareness of the scope and breadth of what biodiversity conservation really means among media personnel. While media coverage of environmental issues (particularly through the press and radio) has increased considerably in recent years, the mass media is yet to be a dynamic instrument capable of generating strong public support for biodiversity conservation and sustainable use.

Few environmental films for TV have been locally produced. Few teledramas produced locally give the message of environmental conservation and potential for sustainable use or benefit sharing. The focus on biodiversity subjects over TV has increased during the last decade, but the medium is severely under-used in view of its potential as a tool for environmental communication as demonstrated by the use of this medium to build awareness and public interest in the fields of politics and sports.

As such public awareness about issues such as alien species (e.g. few lay people questioned during this study know that it is illegal to grow water hyacinth in their gardens or that certain animals cannot be kept as pets). Newspapers, Radio and TV do sometimes do alert the public on major erroneous decisions taken by policy makers that could lead to severe forest degradation or loss of charismatic species. However, these highlights serve to stop such action halfway after considerable costs and effort have been expended, rather than create environmental consciousness to prevent such damage. Further, such media disclosures rarely seem to act as a deterrent to prevent future decisions by policy makers. The more damaging and long-term policies that are not easily perceived on the ground rarely warrant media attention.

Systemic:

- Low importance is given to environmental programmes within the media sector as a whole, compared with politics and sports. Biodiversity is perceived as protected areas, recreation areas and charismatic species. The aspect of biodiversity most highlighted by the media is the aesthetic and recreational value, in relation to protected areas and habitats. The importance and scope of sustainable use of biodiversity for long-term economic benefit and poverty reduction is rarely the focus. Public education via the media on threats to national biodiversity from alien species, GMOs and LMOs and bioterrorism/biopiracy for prevention of threats are rare.
- The absence of a powerful environmental element to the political structure of the country has precluded environmental topics being considered important by newspaper editors and other media heads.
- There are no well run degree courses and accredited post graduate courses in environmental journalism as present. This is in contrast to developed countries and India where many journalists have university degrees in journalism, and are knowledgeable about technical issues concerning the environment.
- There is a dearth of reading material and audio-visual biodiversity related programmes produced in the national languages. Much of the good environmental programmes are imported and in English. As such there should be greater emphasis on dubbing good quality English environmental films in the national languages. (this requires support from media heads and divisional heads which is lacking for the above reasons).

Institutional:

- Newspapers and TV stations (in particular) give scant attention to biodiversity related programmes. The emphasis for TV programmes is on those that bring in money through sponsorship.
- The scope of using environmental topics for political programmes is poorly understood among TV stations; particularly because media personnel have a poor understanding of the varied technical issues involved with biodiversity loss.
- Institutions concerned with environmental conservation should develop closer links with the media. They should provide written material about the work carried out.

Individual:

- Media personnel are often not conversant with environmental issues, and most lack the technical know-how for reliable and dynamic reporting that can mobilise public support and action for environmental conservation.
- Very few editors of newspapers and heads of television institutes are aware of the 'newsworthiness' of biodiversity, the economic value of biodiversity, and the impacts of

biodiversity loss. Hence they give low priority for environmental reporting and programmes.

- Newspaper editors are often reluctant to release experienced journalists to cover environmental issues, allocate space in the newspapers, or allocate the necessary time to enable investigative journalism that will inspire public interest and credibility.
- Heads of divisions at TV stations have particularly poor knowledge of the scope of biodiversity in national development. Biodiversity (and environment as a whole) are rated low when developing the weekly programmes. Even then it is often the visual and aesthetic aspects that are highlighted.
- There is very poor knowledge among media personnel about the functions and mandate of institutions responsible for environmental conservation and environmental laws.
- There is a very poor technical knowledge of biodiversity issues by journalists and audio-visual personnel in general. This is compounded by the lack of readily available information for the more discerning journalists or programme producers. Most depend on what is being said during the programme, rather than on prior investigation of the subject they are presenting.
- Even the few committed environmental journalists are constrained due to the lack of updated knowledge on biodiversity matters. Up-to-date information should be released to journalists and there should be closer contact between the media and the Environmental Ministry. *[The young officers in the MOE and CEA could regularly send articles to the newspapers; the NSF popularisation of science programme should liaise with the MOE to disseminate accurate and up-to-date biodiversity information].*
- At present, few journalists, and radio and TV presenters/programme directors and producers have followed degree level courses in environment topics. This contributes to the poor understanding of biodiversity and related issues. Accredited degree programmes and other training opportunities are required to train good environmental journalists and directors and producers of environmental programmes.
- Some papers depend mostly on freelance journalists for environmental reporting. However, as the pay is poor for freelance writers, there is little motivation to become a good freelance environmental journalist.

● **Overall priority capacity needs and possible interventions to enhance communication, education and public awareness.**

- A comprehensive biodiversity communication, education and public awareness plan should be prepared for the country and implemented. This should cover :
 - Skills building for biodiversity planning to be supported by a more effective consultative process to build a firm commitment among stakeholders who have to implement recommendations in the plan. (There could be short one day training in biodiversity communication planning for state sector officials and NGO staff, to be followed with longer courses on request).
 - Training state sector extension/education officers and NGOs working with schools on activity based participatory education methods.
 - Strengthening capacity for non-formal biodiversity education within state and NGO agencies
 - Establishing a regular mechanism for awareness creation among policymakers (see section 5.1)
 - Capacity building among media personnel for effective and quality environmental reporting and public education, by:
 - initiating accredited training courses degree courses on environmental journalism for media personal.
 - Incentives for quality environmental reporting (award schemes)
 - establishing effective mechanisms to enlist the support of media institutions for more responsible reporting on biodiversity issues.

- Inculcating participatory activity based environmental education into the teacher training curricula and training appropriate teacher trainers to impart these skills.
 - Setting up a mobile biodiversity education and communication unit at the BDS/MOE to provide customised awareness programmes for different stakeholders.
- The BDS should formulate links with the CBD/CEC initiative on Communication, Education and Public Awareness (CEPA). **[Suggested: NSF/MAB could support this process].**

References

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Cross-cutting issues:

The Convention on Biological Diversity, which Sri Lanka has ratified in 1994, addresses the issue of biodiversity loss (and the subsequent environmental and economic damage) due to alien invasive species under Article 8(h). Guiding principles for the Prevention, Introduction, and Mitigation of Impacts of Alien Species has been dealt with extensively at the global level.

It is now accepted globally that prevention of biological invasions is the cheapest, most preferred option and should be given the highest priority.

Capacity building to address entry and establishment of alien species

- Sri Lanka, as an island, is highly vulnerable to alien species invasions and the severe repercussions they could have on the fishery, agriculture, wild biodiversity and hence the national economy.
- At present there is inadequate capacity to prevent entry and establishment of invasive species.

Capacity gaps at systemic level:

- There is illegal importation of potential invasive species as is happening frequently at present and is outside the control of the Plant Quarantine Service.
- Potential invasive species are released against recommendations of the Plant Quarantine Service without strict adherence to the procedures under the provisions of the Plant Protection Act No 35 of 1999.
- There should be a policy of testing prior to intended release of any alien species as they could become invasive with time.

Recommendation

- Strict quarantine procedures adopted by countries such as Australia should be studied and emulated to adopt the precautionary principle with regard to the entry of alien species.

Capacity gaps at institutional level:

- There is inadequate capacity for coordinated and concerted action to prevent the entry and establishment of alien invasive species in Sri Lanka, and for control and eradication measures in the event of accidental entry.

Recommendation

- This requires a mechanism for coordinated action between the Department of Customs and the Plant Quarantine Service to prevent the illegal entry and establishment of invasive species in Sri Lanka.
- Capacity should be built for monitoring and survey for the FD and DWLC to be apprised of the appearance of invasive species (see under survey and monitoring of threats to biodiversity).

Capacity gaps at individual level:

- There is a marked lack of awareness about the ramifications of this problem (environmental and economic) among all sectors of society including the general public, administrators (central and regional) and policy makers.
- TV does not give adequate attention to this problem in their programmes - as media personnel are not fully aware of the ramifications of this problem.
- Capacity is lacking among customs, quarantine and field staff of FD, DWLC, BG, NZG, CEA and DOA to identify invasive species.

Precaution in the context of invasive alien species

Given that the impacts from alien species can be direct, indirect, cumulative and /or complex, unexpected surprising and counter-intuitive, and that they often only show after considerable lag times, any alien species must be considered "guilty" until proven "innocent", where the risk of becoming invasive is concerned.

Source: Aliens, Nos 19 & 20, 2004 (a publication of the Invasive Species Specialist Group of the IUCN Species Survival Commission)