

POSTGRADUATE INSTITUTE OF SCIENCE
UNIVERSITY OF PERADENIYA



M.Sc. in Biodiversity Conservation Management
2010/2011

1. INTRODUCTION

The indispensable role of biological diversity – the variety of life and their habitats on earth-in maintaining the ecological balance and the functioning of the biosphere has been underscored by the global community by adopting the Convention on Biological Diversity at the United Nations Conference on Environment and Development (UNCED) held in June 1992 in Rio de Janeiro which has now been ratified by over 170 countries including Sri Lanka.

Sri Lanka is identified as one of the 18 global Hot Spots in Biodiversity for its species richness and habitat diversity and also the threats that this unique biodiversity is faced with owing to habitat conversion, forest fragmentation, over-exploitation of species, air and water pollution and release of exotic invasive species. The depletion of biodiversity will jeopardize economic development and human health through losses of useful products, genetic stocks and services of natural ecosystems.

It has been estimated that nearly 20 per cent of Sri Lanka's Gross Domestic Product is from agriculture and fisheries and over 75 per cent of the population remain rural and agrarian. Consequently, both indigenous and introduced biodiversity play a major role in sustaining Sri Lankan people and their economy. Having recognized this indispensable role of biodiversity in maintaining the well-being of Sri Lankan people and their economy, a National Biodiversity Conservation Action Plan (BCAP) has been prepared by the Ministry of Forestry & Environment as a framework for action to ensure that the biological diversity of the country is conserved and sustainably used. A ten-year implementation phase has been proposed having identified the goals and objectives, stakeholders and recommended actions.

One of the recommended activities in this action plan is the promotion of postgraduate specialization in biodiversity with a view to building the capabilities needed for the implementation of this BCAP and other relevant sectoral and cross-sectoral programs. The Postgraduate Institute of Science (PGIS) through its Board of Study in Plant Sciences has designed this M.Sc. programme in 'Biodiversity Conservation Management' to cater to this critical need identified at the national level by the BCAP.

2. OBJECTIVES OF THE PROGRAMME

To impart a scientific knowledge of biodiversity and its conservation management with an emphasis on its ecological role in sustainable development. This programme has been designed for those who seek employment in forestry, wildlife, agriculture, environment and biological resource management sectors and those engaged in biodiversity research and teaching.

3. PROGRAMME ELIGIBILITY

Those qualified with a degree in Science with Botany/Zoology/Biology as a subject or in Agriculture or a Special Degree in Geography from a recognized University may apply. Graduates without the above qualifications will be required to follow prerequisite course recommended by the course-coordinators and acceptable to the Board of Study of Plant Sciences.

Candidates having required basic qualifications will be selected after a selection test and an interview. The medium of instruction and examination will be English. Consequently, the candidates will be expected to have a satisfactory knowledge of English. As considerable amount of field work is involved, enrolment at any given time will be restricted to about 14 students who are strongly motivated to follow such a programme.

4. PROGRAMME FEE

	M.Sc. programme fee
Local candidates	Rs. 80,000/-
SAARC countries	US \$ 2,600/-
Other countries	US \$ 5,200/-

Programme fees shall be paid in two instalments (*Rs. 40000/- at the registration and next Rs. 40000/- within six months from registration*). Other payments including registration fee, medical fee, library subscription, examination fee and deposits (science and library) should be paid according to the procedure stipulated by the PGIS.

5. THE PROGRAMME STRUCTURE AND DURATION

This is a full-time programme consisting of course work and a research project. Course work will be conducted over a period of two semesters of 15 - weeks each (*during weekends*) over a period of about 12 months at the Department of Botany, University of Peradeniya. The entire programme duration will be about 18 months inclusive of further six months for the research project. Satisfactory completion of a minimum of 24 credits of course work (with a GPA of not less than 3.00) is required for the programme in addition to the 6 credits allocated for the full-time research project (*The student who does not satisfy the above criteria but obtains a GPA in the range 2.75 to 2.99 for course work is eligible for the Diploma in Biodiversity Conservation Management but not the M.Sc. Degree*). Continuous attendance on full-time basis is compulsory during the period of research work. After successful completion of the research project, the student is eligible for the award of the M.Sc. Degree.

Programme Summary

Course Code	Course	Lecture hrs.	Practical hrs.	No. Of Credits
Semester I				
PL 504	Biostatistics	15	30	2
PL 531	Characterization of Biodiversity	30	30	3
PL 532	Inventorying and Monitoring of Biodiversity	30	30	3
PL 533	Sri Lankan Biodiversity	15	60	3
PL 534	Population Dynamics	30	30	3
Semester II				
PL 546	Behavioral Ecology *	15	30	2
PL 547	Community and Ecosystem Dynamics	15	30	2
PL 548	Conservation Biology *	15	-	1
PL 549	Protected Area Classification & Legislation	15	30	2
PL 550	Conservation Management of Biodiversity	15	30	2
PL 551	Sustained Yield Management of Biodiversity *	30	30	3
PL 552	Bioeconomics and Biopolitics *	30	-	2
PL 599	Research Project (3 - 6 months)			6

* *Optional courses*

6. PROGRAMME CONTENTS

PL 504: Biostatistics

(02 credits: 15h lectures & 30 hrs practical work)

Variability in observations, Frequency distribution and histograms, Stem-leaf and box plots, Population and sample, The family of normal distributions, Statistical inference, Test of hypothesis. Experimental design, data collection and management; Analysis of variance; Regression & correlation; Introduction to multivariate analysis, geographic information system and modelling.

PL 531: Characterization of Biodiversity

(03 credits: 30h lectures & 30 hrs Lab work & Field classes)

Concept and components; Taxonomic characterization; Molecular characterization; Ecological characterization; Abiotic & biotic components, Ecological energetics; Trophic structure; Food chains, webs & pyramids, Productivity & sustainability; Ecological hierarchy; Frequency & abundance.

PL 532: Inventorying and Monitoring of Biodiversity

(03 credits: 30h lectures & 30 hrs Lab work & Field classes)

Population estimation & analysis; Biodiversity estimation; Species diversity & its measurements; Local, regional, national & global biodiversity estimates; Periodic monitoring; Inventory data-base management.

PL 533: Sri Lankan Biodiversity

(03 credits: 15h lectures & 60 hrs Lab work & Field classes)

Vegetation types, their structure & composition; Faunal and floral diversity, Endemism; Affinities with South & South-East Asian Biota; Threatened species & red data lists; Diversity of domesticated species; Descriptive ecology of terrestrial, fresh-water and marine ecosystems.

PL 534: Population Dynamics

(03 credits: 30h lectures & 30 hrs Lab work & Field classes)

Population parameters; Demographic features; Species interaction; Interspecific competition; Predation; Decomposers and detritivores.

PL 546: Behavioral Ecology

(02 credits: 15h lectures & 30 hrs Lab work & Field classes)

Social, feeding & sexual behavior; Territoriality; Sexual conflicts and sexual selection; Mating systems; Agonistic behavior; Dominance hierarchy; Behavior related management issues.

PL 547: Community and Ecosystem Dynamics

(02 credits: 15h lectures & 30 hrs Lab work & Field classes)

Community change; Flux of energy through the community; Flux of matter through the community; Plant reproductive biology; Ecosystem responses to climate change; Forest die-back.

PL 548: Conservation Biology

(01 credit: 15h lectures)

Ecological principles of conservation, Habitat fragmentation and its consequences, Concept of minimal viable population; Extinction; Captive propagation and reintroduction, Forest corridors; Conservation of wild relatives of domesticated species.

PL 549: Protected Area Classification & Legislation

(02 credits: 15h lectures & 30 hrs Lab work & Field classes)

Global & local classifications; Selection & zoning criteria; Forestry, wildlife, land use, soil conservation & environmental policies/ordinances/acts; International conventions/ protocols on biodiversity, biosafety, wetlands, migratory & endangered species, natural heritage, climate change, ozone depletion and their implications on conservation of biodiversity.

PL 550: Conservation Management of Biodiversity

(02 credits: 15h lectures & 30 hrs Labwork & Field classes)

Conservation management of protected areas and their buffer zones, theory & practice; Habitat management; Translocation; Reintroduction of species; Case studies of management of threatened species and ecosystems; Invasive species; Ex Situ conservation in Botanical & zoological gardens, germplasm centers, home gardens, avenues, hedges; Non-extractive uses.

PL 551: Sustained Yield Management of Biodiversity

(03 credits: 30h lectures & 30 hrs Lab work & Field classes)

Principles of harvesting plants and animals for sustained yield; Silvicultural management of natural forests and plantations; Participatory forest management for multiple uses; Role of peripheral communities, community based organizations and private sector in biodiversity management; Sustainable harvesting from terrestrial, aquatic & marine ecosystems; Agroforestry & livestock farming.

PL 552: Bioeconomics and Biopolitics

(02 credits: 30h lectures)

Human population growth and its implications for conservation and sustainable development; Earth summit and its follow-up; Economic value of biodiversity and their estimation; Impact of global exchange economy and world trade on biological diversity; Biotechnology and biosafety in biodiversity management; Intellectual Property Rights and Patent Protection of Biodiversity and its products, cultural diversity and indigenous knowledge.

PL 599: Research Project

(06 credits: 3 - 6 months duration)

Each student is expected to carry out a field research project assigned to him/her by one or a panel of supervisors. The project shall be completed and written up as a report within a period of six months.

The candidate is expected to present a seminar based on his/her research findings before the final submission of the dissertation.

7. PROGRAMME EVALUATION

Programme evaluation will be as stipulated in the PGIS Hand Book.

8. TEACHING PANEL

- Dr. A.A.L. Amerasinghe, Dept. of Agriculture, Peradeniya
B.Sc., Ph.D. (Oregon)
- Dr. N. Attapattu, Dept. of Wildlife Conservation, Colombo
B.V.Sc. (Perad.), Ph.D.
- Dr. N. Dayawanse, Dept. of Zoology, University of Colombo
B.Sc., Ph.D. (Aberdeen)
- Dr. J.D.S. Dela, No. 21, Goonetilleke Mawatha, Etambagoda, Panadura
B.Sc., Ph.D. (Perad.)
- Prof. J.P. Edirisinghe, Dept. of Zoology, Faculty of Science, Univ. of Peradeniya
B.Sc. (Cey.), Ph.D. (Adelaide)
- Dr. A.M.T.A. Gunaratne, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Perad.), Ph.D. (Aberd.)
- Prof. C.V.S. Gunatilleke, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Cey.), M.Sc. (Aberd.), Ph.D. (Aberd.)
- Prof. I.A.U.N. Gunatilleke, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Cey.), Ph.D. (Cantab.)
- Dr. H.M. Gunatilleke, Dept. of Agriculture Economics, Faculty of Agriculture, Univ. of Peradeniya
B.Sc. Agric. (Cey.), M.Sc., Ph.D. (Hawaii)
- Dr. E.R.N. Gunawardena, Dept. of Agriculture Engineering, Faculty of Agriculture, Univ. of Peradeniya
B.Sc. Agric. (Cey.), M.Sc., Ph.D. (Cranfield)
- Dr. A.H.M. Jayasuriya, Plant Genetic Resources Centre, Gannoruwa
B.Sc., Ph.D. (CUNY)
- Dr. K.M.G.G. Jayasuriya, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Perad.), Ph.D. (Kentuki, USA)
- Dr. S.H.P.P. Karunaratne, Dept. of Zoology, Faculty of Science, Univ. of Peradeniya
B.Sc. (Perad.), M.Sc. (Perad.), Ph.D. (London)
- Prof. S.A. Kulasooriya, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Cey.), Ph.D. (London)
- Prof. R.B. Mapa, Dept. of Soil Science, Faculty of Agriculture, Univ. of Peradeniya
B.Sc. Agric. (Cey.), Ph.D. (Hawaii)
- Dr. U.K.G.K. Padmalal, Division of Zoology, Open University of Sri Lanka
B.Sc. (Cey.), Ph.D. (Tohoku, Sendai)
- Dr. G.A.D. Perera, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Perad.), M.Sc. (Oxon), D.Phil. (Oxon)
- Mr. K.B. Ranawana, Dept. of Zoology, Faculty of Science, Univ. of Peradeniya
B.Sc. (Cey.), M.Phil. (Perad.)
- Dr. P. Sarawanakumar, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc., M.Sc., Ph.D. (India)
- Dr. W.A.D.P. Wanigasundara, Dept. of Agricultural Economics & Extension, Faculty of Agriculture, Univ. of Peradeniya
B.Sc. Agric. (S. Lan.), Ph.D. (Reading)
- Dr. D. Weerakoon, Dept. of Zoology, Faculty of Science, Univ. of Colombo.
B.Sc. (Perad.), Ph.D. (USA)

Dr. S. M. Weerasinghe, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc. (Perad.), Ph.D. (Cantab.)

Dr. N.D.R. Weerawardane, Forest Dept., Colombo
B.Sc. (Cey.), Ph.D.

Dr. P. Wickremagamage, Dept. of Geography, Univ. of Peradeniya
B.A. (Perad.), Ph.D. (London)

Dr. D.S.A. Wijesundara, Royal Botanic Gardens, Peradeniya
B.Sc. (Cey.), Ph.D. (CUNY)

Dr. D. Yakandawala, Dept. of Botany, Faculty of Science, Univ. of Peradeniya
B.Sc., Ph.D. (Reading)

Outside Experts

Ms. C. Ariyaratne, Tea Research Institute, Thalawakele
B.Sc. (Perad.), M.Sc. (Perad.), M.Phil. (Colombo)

Mr. J. Gunawardana, 4/15 Stanley Thilakaratna Mawatha, Nugegoda
Diploma in Agriculture (Perad.), LL.B. (Col.)

9. RECOMMENDED BOOKS

1. Ministry of Environment and Natural Resources 2007, Addendum to Biodiversity Conservation in Sri Lanka, A Framework of Action, Ministry of Environment and Natural Resources, Battaramulla, Sri Lanka.
2. Ministry of Forestry and Environment 1999, Biodiversity Conservation in Sri Lanka, A Framework of Action. Ministry of Forestry and Environment, Battaramulla, Sri Lanka.
3. William J. Sutherland, 2000, The Conservation Handbook, Blackwell Science, pp 1-273.
4. William J. Sutherland, 1998, Conservation Science and Action. (through internet <http://www3.interscience.wiley.com/cgi-bin/bookhome/122604053?CRETRY=1&SRETRY=0>)

10. PROGRAMME COORDINATORS

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