Marine Biological Resources Division (MBRD)

Overview

The **Marine Biological Resources Division (MBRD)** is vested with the responsibilities of carrying out research towards management, development and conservation of marine living resources and ecosystems. The division has multidisciplinary research priorities with strengths in both biological and biotechnological research.

MBRD serves as the scientific backbone for Sri Lanka's marine fisheries management, providing essential data, expert advice, and research support to government agencies, regional organizations, and international bodies concerned with sustainable utilization of marine resources.

Leadership & Contact

Head of Division

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Staff Strength

The division maintains a robust research capacity with:

- **16 Scientists** conducting research across multiple disciplines

- **2 Development Officers** coordinating field programs

- **7 Research Assistants** supporting laboratory and field work

- **9 Field Research Assistants** covering major fishing ports throughout Sri Lanka

This network ensures comprehensive data collection from key fishing harbors including Negombo, Chilaw, Kalpitiya, Mirissa, Galle, Tangalle, Trincomalee, and Jaffna.

Key Functions & Responsibilities

Marine Conservation & Management

- Supporting conservation and management of marine biological resources, habitats and ecosystems

- Providing scientific advice and services to national, regional and international bodies on marine conservation

- Sensitizing the public on conservation issues through awareness programs and publications

- Developing management plans for sustainable exploitation of marine resources

Fisheries Data Management

- Maintaining and updating large pelagic and small pelagic fishery databases

- Analyzing fisheries data using advanced statistical methods

- Preparing national statistics on fish production by species and fishing method

- Providing catch and effort data to regional fisheries management organizations

Stock Assessment & Monitoring

- Conducting multidisciplinary and integrated field, laboratory and experimental research

- Monitoring and scientific assessment of finfish and shellfish stocks in Sri Lankan waters

- Predicting status of fish populations using stock assessment models

- Providing advice for sustainable exploitation of fisheries resources

Expert Services

- Providing expert reports for fishing disputes resolution

- Analyzing fish samples for legal cases (dynamite fishing detection)

- Appearing as expert witnesses in Magistrate Courts

- Advising on violations of fisheries and wildlife regulations

- Supporting Department of Fisheries and Aquatic Resources with technical expertise

Regional & International Collaboration

- Supporting management of highly migratory and shared fisheries resources

- Providing fisheries statistics to Indian Ocean Tuna Commission (IOTC)

- Collaborating with regional fisheries management organizations

- Participating in international marine research programs

Services Offered

Fishery Statistics & Analysis

- Comprehensive fishery production data by species, gear, and region

- Catch per unit effort (CPUE) analysis for stock assessment

- Seasonal and annual trend analysis

- Export-import statistics compilation

- Fleet composition and fishing effort monitoring

Species Identification

The division's **Biotechnology Unit** provides advanced molecular identification services:

- Species identification when morphological features are unclear

- Identification of species in canned fish and processed marine products (import/export verification)

- Shark fin species identification for conservation and trade regulation

- Stranded marine mammal identification

- New species documentation (jellyfish, octopus, and other marine organisms)

- Quality control for seafood products

Research Support Services

- Facilities and guidance for university students conducting industrial training and research projects

- Support for school children's research projects

- Collaboration with academic institutions on marine research

- Data sharing for scientific publications

- Training programs for students and early-career researchers

Advisory Services

- Technical advice to fishing communities on sustainable practices

- Support to private sector fisheries enterprises

- Consultation on marine resource utilization

- Ecosystem approach to fisheries management guidance

Current Research Projects

Project 2.1: Coastal Fishery Resources Monitoring

Monitoring and Assessment of Coastal Fishery Resources in Sri Lanka

Comprehensive program monitoring:

- Multi-species coastal fisheries across Sri Lanka's coastline

- Small-scale fishing operations and artisanal fisheries

- Seasonal variations in catch composition

- Impact of environmental factors on coastal resources

- Community-based fisheries management indicators

Project 2.2: Large Pelagic Fishery Assessment

Monitoring and Assessment of Large Pelagic Fishery Resources

Focus on economically important species including:

- Yellowfin tuna (*Thunnus albacares*)

- Skipjack tuna (*Katsuwonus pelamis*)

- Billfish (marlins, sailfish, swordfish)

- Dolphinfish (mahi-mahi)

- Wahoo and other large pelagics

Data collection and analysis supporting:

- Sustainable catch limits determination

- Reporting to Indian Ocean Tuna Commission

- Assessment of stock status and trends

- Fishing effort optimization

Project 2.3: Norway-Sri Lanka Bilateral Collaboration

Project 2.3.1: Strengthening Marine Fisheries Data Collection

- Enhancement of data collection systems at major fishing ports

- Training of field research assistants on standardized protocols

- Implementation of electronic data collection tools

- Quality assurance procedures for fishery statistics

- International best practices adoption

Project 2.3.2: Fisheries Independent Bottom Trawl Surveys in Kalpitiya

- Scientific surveys independent of commercial fishing data

- Bottom trawl sampling of demersal resources

- Species composition and abundance assessment

- Habitat mapping and ecosystem characterization

- Baseline data for management decisions

Specialized Units & Facilities

Biological Laboratory

Comprehensive marine biology research facility equipped with:

- Dissection and specimen preparation areas

- Microscopy (stereoscopic and compound microscopes)

- Age and growth analysis equipment (scale readers, otolith preparation)

- Reproductive biology analysis tools

- Morphometric measurement systems

- Specimen preservation facilities

Biotechnology Unit

State-of-the-art molecular laboratory capable of:

- DNA extraction from various tissue types

- Polymerase Chain Reaction (PCR) amplification

- DNA sequencing for species identification

- Genetic stock identification analysis

- Phylogenetic studies

- Molecular marker development

Services Provided:

- Identification of any marine organism (animal or plant) to species level using molecular methods

- Analysis when morphological features are not clear for identification

- Import/export product species verification

- Stock identification studies for fisheries management

- Collaboration with conservation agencies on protected species

Coral Reef Unit

Specialized unit for coral reef research and monitoring:

- Underwater survey equipment (SCUBA, snorkeling gear)

- Coral identification and assessment protocols

- Reef health monitoring programs

- Fish community surveys

- Habitat mapping using photographic methods

- Coral bleaching and disease monitoring

Marine Museum

Educational and research collection featuring:

- Preserved specimens of Sri Lankan marine species

- Taxonomic reference collection

- Educational displays for visitors

- Research specimens for comparative studies

- Historical collection of marine biodiversity

Major Research Areas

Stock Assessment Studies

- Population dynamics modeling

- Yield per recruit analysis

- Maximum Sustainable Yield (MSY) estimation

- Biomass assessment using survey data

- Age-structured stock assessment models

Bioluminescence Research

- Studies on bioluminescence species in Southern Bay of Bengal

- Ecological role of bioluminescent organisms

- Distribution patterns and abundance

- Relationship with oceanographic parameters

Crab Biology & Fisheries

- Reproductive biology of three-spot swimming crab (*Portunus sanguinolentus*)

- Population structure and dynamics

- Sustainable harvesting strategies

- Fishery management recommendations

Underwater Surveys

- Coral reef assessments using standardized protocols

- Bar Reef Marine Sanctuary monitoring

- Reef fish community structure analysis

- Habitat degradation assessment

- Marine protected area effectiveness evaluation

Ecosystem Approach

- Coastal zone management research

- Co-management initiatives with fishing communities

- Ecosystem approach to fisheries implementation

- Biodiversity conservation programs

- Marine spatial planning support

Outreach & Education Programs

Training for Law Enforcement

Regular lectures and awareness programs for:

- **Sri Lanka Coast Guard:** Marine species identification, illegal fishing methods detection, conservation law enforcement

- **Sri Lanka Navy:** Protected species awareness, fisheries regulations, marine ecosystem conservation

- **Fishing Community:** Sustainable fishing practices, ecosystem conservation, legal compliance

University Collaboration

- Industrial training placement for undergraduate students

- Supervision of final year research projects

- Postgraduate research collaboration

- Guest lectures on marine biology and fisheries

- Joint research publications

School Programs

- Research project guidance for school children

- Educational visits to Marine Museum

- Marine conservation awareness programs

- Ocean literacy initiatives

- Career guidance in marine sciences

Legal & Regulatory Support

Dynamite Fishing Cases

- Expert analysis of fish samples to determine if killed by explosives

- Preparation of technical reports for court proceedings

- Expert witness testimony in Magistrate Courts

- Collaboration with Police and Department of Fisheries on illegal fishing cases

Fisheries Regulations

- Technical advice on fisheries regulations

- Assessment reports for fishing disputes

- Violation investigation support

- Conservation law enforcement assistance

International Reporting

Indian Ocean Tuna Commission (IOTC)

- Annual catch and effort statistics submission

- Species composition data provision

- Compliance with IOTC conservation measures

- Participation in working group meetings

- Scientific paper presentations

Other Regional Bodies

- Bay of Bengal Programme Inter-Governmental Organisation (BOBP-IGO)
- Southeast Asian Fisheries Development Center (SEAFDEC)
- Food and Agriculture Organization (FAO)
- Convention on Biological Diversity (CBD)

Major Achievements

- Establishment of comprehensive fisheries database spanning decades
- International recognition for quality fisheries statistics
- Successful prosecution of illegal fishing cases with expert evidence
- Molecular identification laboratory serving national needs
- Coral reef monitoring program providing long-term data
- Contribution to regional tuna management
- Training hundreds of students and law enforcement personnel
- Published numerous peer-reviewed scientific papers

Future Directions

- Enhancement of real-time fisheries data collection using mobile technology
- Expansion of electronic monitoring on fishing vessels
- Development of ecosystem-based fisheries management frameworks
- Climate change impact assessment on marine resources
- Expansion of protected marine species monitoring
- Strengthening of marine biodiversity research
- Enhanced collaboration with regional research institutions
- Application of genomic tools for stock assessment
- Citizen science programs for data collection

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