MAURITIUS OCEANOGRAPHY INSTITUTE

Annual Report 2014

Contents

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MAURITIUS OCEANOGRAPHY INSTITUTE

Chairman's Letter

To Honourable Premduth Koonjoo
Minister of Ocean Economy,
Marine Resources, Fisheries,
Shipping and Outer Islands
Republic of Mauritius

In accordance with the provision of the MOI Act 1999 Section 22, I have the honour to submit to you the Annual Report of activities and accounts of the Mauritius Oceanography Institute for the Financial Year which ended on 31 December 2014.

Yours sincerely,

Raj H. PRAYAG, PDSM
Chairman

MAURITIUS OCEANOGRAPHY INSTITUTE

Vision and Mission Statement

The Mauritius Oceanography Institute (MOI) established in January 2000 by the proclamation of the MOI Act (Act No. 24 of 1999) is a parastatal body functioning under the aegis of the Prime Minister's Office which advises Government on the formulation and implementation of policies and programmes in respect to oceanography.

TThe objectives of the MOI, as spelt out in the Act, are:

- to foster interest in research and development in relation to oceanography,
- to advise Government on the formulation and implementation of policies and programs in respect to oceanography and related aspects,
- to coordinate, collaborate and co-operate with other institutions, agencies and persons on national, regional and global issues within its field of interest, and to assist any organisation, body or person in creating sustainable research and development programs in areas of interest and activity related to oceanography,
- to demonstrate and communicate to the scientific community and the public at large the results and the importance of oceanography in the conservation, maintenance, management, utilisation and development of resources based on marine and coastal ecosystems,
- to manage and optimise the use of funds and other resources for the purpose of this Act.

Vision

To become the centre of excellence in Oceanography in the Indian Ocean region by contributing towards the advancement of oceanography at the national, regional and international level for the welfare of the people of the Republic of Mauritius.

Mission

To develop and strengthen oceanographic research, using an integrated scientific approach, to enhance understanding of ocean and coastal processes, for rational development of marine resources, within the maritime zone of the Republic of Mauritius.

MOI
MAURITIUS OCEANOGRAPHY INSTITUTE

Functions of the Institute

The Institute shall have such functions as, in its opinion, are necessary to further most effectively the objectives of the Institute, and in particular:

- To initiate, encourage, launch, facilitate, support, undertake, participate in, rationalise and coordinate research and development in relation to oceanography having regard to the national, regional and international interests of Mauritius, its needs and priorities;
- To arrange for carrying out such research and development;
- To provide any other institution, body or person with facilities for carrying out such research and development;
- To maximise opportunities and arrangements for such research and development on a collaborative basis;
- To encourage and facilitate the application and use of the results of such research and development;
- To prepare, fund, implement and periodically update and monitor programmes relating to the sustainable development of marine resources;
- To collect, coordinate, store and disseminate information relating to oceanography and to publish reports and other material relating to oceanography;
- To identify training needs in the field of oceanography;
- To make available to other institutions, bodies or persons, on such items and conditions as it thinks fit such as knowledge, expertise, equipment or facilities of the Institute;
- To do anything incidental or conducive to the performance of any of its functions under this section.

Strategic Plan 2011 – 2015

SWOT Analysis for MOI

STRENGTHS	WEAKNESSES
▪ Strong, young, dynamic, highly skilled and motivated staff	▪ Lack of specific training for specific projects
▪ Good working environment	▪ Need for additional staff at support level
▪ Simplified management procedures, good management style	▪ Lack space and equipment for laboratory and a dedicated boat for fieldwork
▪ Good regional visibility	▪ Conflict of interest within Board
▪ Good team spirit within departments and specific working groups	▪ Poor visibility of products and services among general public and students

OPPORTUNITIES	THREATS
▪ Vast EEZ and Extended Continental Shelf	▪ Increasing brain drain
▪ Potential for providing consultancy services	▪ Lack of funding
▪ Climate change research	▪ Inability to keep up with technological development
▪ Assist in developing Government policies	▪ Lack of IPR framework to protect research
▪ Increased interest of private sector, external donors and research institutions in MOI work	▪ Lack of legislative framework to protect local research
	▪ Overlapping mandates

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Strategic Objectives

During the four-year span of the present Strategic plan, the MOI will focus on five main strategic objectives. Most of the projects proposed in order to meet these objectives will bring direct or indirect economic benefits to the country.

Strategic Objective 1:

- Initiation, launching and undertaking research and development in relation to oceanography having regard to the national, regional and international interests of Mauritius, its needs and priorities.

- **Secure and explore the potential maritime and EC zone of Mauritius under UNCLOS**
  - Provide technical and scientific support to CLCS Team. Arrange for collection of additional data for Rodrigues and Mascarene Plateau to support submission for ECS. Preparation of ECS submission for the Chagos region.
  - Support JMC in respect of Geology and Petrology of joint ECS zone of Mauritius and Seychelles.
  - Carry out surveys for collection of data in our EEZ and ECS
  - Bathymetry studies
  - Resource Stock Assessment (Population identification using genetics followed by surveys)
  - Biodiversity Assessment, Identification and Bar Coding
  - Marine Bioinformatics
  - Marine Archaeology
  - Deep sea, Hydrocarbon and Mineral Exploration

- **Development and implementation of operational oceanographic services using earth observation systems (initially through AMESD)**
  - Hazards Management – Current and Wave Information Service for Search and Rescue operations, Oil Spill etc.
  - Potential Fishing Zone Service
  - Development of Marine and Climatological Indicators (Biomass, Primary Production…)

- **Aquaculture**

Coordinate and contribute to economic feasibility and technical trials for the production of:

- Oysters
- Pearl Oysters
- Mussels

- Sea Urchins
- Sea Cucumbers
- Ornamental fishes

- Potential exploitation of natural products from the sea
  - Pharmaceuticals (ongoing)
  - Cosmetics and Food Supplements

Strategic objective 2:

- Fostering of interest in research and development in relation to oceanography.
- To work with Mauritius Museums Council, Public Aquaria, University of Mauritius …

Strategic objective 3:

- Advising Government on the formulation and implementation of policies and programs in respect of oceanography and related aspects
- Initiate and coordinate consultations with stakeholders on the development of an integrated marine policy for submission to government of Mauritius.
- Assist the Prime Minister's Office in the formulation of regulations for the Maritime Zones Act.

Strategic Objective 4:

- Co-ordination, collaboration and co-operation with other institutions, agencies and persons on national, regional and global issues within its fields of interest, and assistance to any organisation, body or person in creating sustainable research and development programmes in those areas of interest and activity related to oceanography.

- **Climate change impacts and adaptation strategies**
  - Impacts of sea level rise using past data and predictive models
  - Impacts on marine resources
  - Mitigating measures
  - Propagation of bleaching-resistant and threatened coral species
  - Reef restoration
  - Coral sanctuary creation

- **Disaster reduction strategies: tsunami studies**
  - Hazard and Risk Mapping to contribute to evacuation strategy

- **Seismic activities**
  - Database of seismic activities in the region
  - Contribution to "Maurice Ile durable"
  - Waves and Tides
  - Bio-fuels

- **Threats to the environment**
  - Studies on Invasive Species in collaboration with the Ministry of Infrastructure, Land Transport and Shipping
  - Pollution studies-modelling, integrating regional projects (ASCLME WIOLab)
- **Networking and collaboration with regional and international oceanographic institutions.**

Strategic objective 5:

- Demonstration and communication to the scientific community and the public at large of the results of research and the importance of oceanography in the conservation, maintenance, management, utilisation and development of resources based on marine and coastal ecosystems.

- Consultancy Services
  - Bathymetry
  - Genetic studies
  - CLCS

- Awareness and Communication
  - National Ocean Science Forum (Held every two years)
  - Workshops, seminars and training courses in connection with Oceanography

The Board

The MOI is managed by a Board, consisting of a Chairperson appointed by the Prime Minister and senior representatives of different ministries and institutions. Sections 8 to 10 of the MOI Act of 1999 lay down the overall responsibility of the Board.

The composition of the Board for the year 2014 was as follows:

1. Chairman of the MOI Board:
   - Mr. S. C. Seeballuck, GOSK
2. The Secretary for Home Affairs, Prime Minister's Office, or his representative:
   - Mr. S. C. Seeballuck, GOSK, Secretary to Cabinet and Head of the Civil Service
3. A representative of the Ministry to which the responsibility for the subject of Foreign Affairs is assigned:
   - Mr. V. Mungur, Minister Counsellor
4. A representative of the Ministry to which the responsibility for the subject of Finance is assigned:
   - Mrs. S. Rama, Principal Financial Management Analyst
   - Mrs. Waseefah Elahee Domun (as from 20th September 2013)
5. A representative of the Ministry to which the responsibility for the subject of Economic Development is assigned:
   - Vacant
6. A representative of the Ministry to which the responsibility for the subject of Environment is assigned:
   - Mr. P. Jhugroo, Permanent Secretary
7. A representative of the Ministry to which the responsibility for the subject of Fisheries is assigned:
   - Mr. D. Mauree, Director of Fisheries
   - Mr. A. C. Moosuddee, Permanent Secretary
8. A representative of the Ministry to which the responsibility for the subject of Lands is assigned:
   - Mr. Sooresh Teckman, Principal Surveyor
9. A representative of the Ministry to which the responsibility for the subject of Rodrigues is assigned:
   - Vacant
10. The Executive Director of the Mauritius Research Council or his representative:
    - Dr. A. Suddhoo, Executive Director
11. The Vice Chancellor of the University of Mauritius or his representative:
    - Dr. R. T. Ramessur, Associate Professor
12. The Director of the Mauritius Meteorological Services or his representative:
    - Mr. M. Beebeejaun, Director

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13. The Director-General of the Mauritius Ports Authority or his representative:
    - Captain L. G. Barbeau, Port Master
14. The General Manager of the Outer Islands Development Corporation or his representative:
    - Mr. P. Davay, General Manager
15. Members having wide experience in oceanography or international law appointed by the Minister:
    - Mrs. A. Narain, Parliamentary Counsel, Attorney General's Office
    - Mr. S. Ho Man Cheong
    - Mr. S. Ragoonaden

Corporate Governance Report

Statement of compliance

The Board of Directors of the MOI ensures that the principle of good corporate governance, as applicable in Mauritius, are fully adhered to and form an integral component in the manner the activities and projects of the Institute are conducted.

Board of Directors and Committees

The Board consists of fifteen Directors and is led by the Chairman with a non-executive Director. A list of Directors is on page 10 and 11 of the Annual Report. The Board has met on four occasions during the year 2014. Its principal functions include the following:

- Ensuring that the institute has clear goals and policies in matter related to oceanography.
- Ensures institute objectives are adhered to and carried out efficiently.
- Approve acquisition and disposal as appropriate to the institute.

The Board has established a Research Advisory Council to assist in the discharge of its research functions. A list of the Research Advisory Council's meetings held between January and December 2014 is provided at page 15.

The Board has also appointed a Staff Committee. A list of the Staff Committee's meetings for the year 2014 is also provided at page 15. A list of the Finance Committee's meetings is also provided at page 16.

The Board of Directors of MOI acknowledge their responsibilities for:

1. Adequate accounting records and maintenance of effective control systems;
2. The preparation of the Financial Statements which fairly illustrates the state of affairs of the MOI as at the end of the period January to December 2014 and the results of its operations and cash flows for that period and which complied with International Public Sector Accounting Standards (IPSAS) and;
3. The selection of appropriate accounting policies supported by reasonable and prudent judgement.

The directors report that:

1. Adequate accounting record and effective system of internal controls have been maintained;
2. Appropriate accounting policies supported by reasonable and prudent judgement and estimates have been used consistently;

3. Appropriate Accounting Standards have been adhered to and;

4. The code of corporate governance as applicable to state owned enterprises has been adhered to.

Health and Safety

MOI is committed to providing and maintaining a healthy, safe and secured working environment. It believes in raising awareness on health issues that are imperative in the prevention of accident and improving the well-being of its staff.

Remuneration to Directors for the period of January to December 2014

BOARD MEMEBRS

Name	Ministry/Institution/ Department	No. of Meetings	Total
Mr. S. C. Seeballuck (Chairman)	PMO	-	Rs. 252,000
Dr. R. T. Ramessur	UOM	4	Rs. 4,800
Mr. S. Ragoonaden	-	2	Rs. 2,400
Mr. S. Ho Man Cheong	-	4	Rs. 4,800
Mr. S. Teckman	Ministry of Housing and Lands	4	Rs 4,800
Dr. A. Suddhoo	MRC	3	Rs. 3,600
Mr. R. Beedassy	MOESD	4	Rs. 4,800
Mr. V. Mungur	Ministry of Foreign Affairs	4	Rs. 4,800
Mr. P. Davay	OIDC	3	Rs. 3,600
Mrs. A. D. Narain	AGO	4	Rs. 4,800
Mr. D. Mauree	Ministry of Fisheries	4	Rs. 4,800
Mr. M. Beebeejaun	MMS	3	Rs. 3,600
Capt. L. G. Barbeau	MPA	3	Rs. 3,600
Mrs. W. Elahee-Domun	MOFED	4	Rs. 4,800
Mr. B. Boyramboli	Ministry of Fisheries	3	Rs. 3,600

RESEARCH ADVISORY COUNCIL

Name	Ministry/Institution/ Department	No. of Meetings	Total
Mr. S. Ragoonaden	Board Member	4	Rs. 4,560
Ms. H. Ramdour	Ministry of Environment	4	Rs. 3,100
Dr. B. Pathack	-	3	Rs. 2,325
Ins. A. R. Jawarun	NCG	3	Rs. 2,325
Mr .K. Narrain	MRC	3	Rs. 2,325
Mr. Outam Kumar Guness	NCG	1	Rs. 775
Mr. S. Soondron	Ministry of Fisheries	1	Rs. 775
Mrs. M. S. Koonjul		1	Rs. 775
Mr. C. N. Paupiah		1	Rs. 775

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STAFF COMMITTEE

Name	Ministry/Institution/ Department	No. of Meetings	Total
Dr. R.T. Ramessur	UOM	10	Rs. 11,400
Capt L.B. Barbeau	MPA	5	Rs. 3,875
Mr. S. Ho Man Cheong	Board Member	10	Rs. 7,750
Mr. S. Soondron	Ministry of Fisheries	5	Rs. 3,875
Mr. D. Mauree	Ministry of Fisheries	3	Rs. 2,325

LEGAL FEE

Name	Ministry/Institution/ Department	No. of Meetings	Total
Mrs. O. G. Topsy	AGO	10	Rs. 35,000
Mr. O. B. Madhub		2	Rs. 7,000

INTERVIEW PANEL

Name	Ministry/Institution/ Department	No. of Meetings	Total
Dr. A. Suddhoo	MRC		Rs. 30,000
Dr. R.T. Ramessur	UOM		Rs. 25,000
Mrs. A.D. Narain	AGO		Rs. 25,000
Mr. S. Ragoonaden	Board Member		Rs. 25,000
Mr. S. Pursunon	PMO		Rs. 20,000

Key Management Personnel

Name	Post Held	Period	Monthly Gross Salary	Monthly Allowance(s) (Rs.)	Other(s) (Rs.)	Total (Rs.)
Dr. V. R. Mangipudi	Director	13.01.2014 – 31.12.2014	111,000	30,000 (Rent) 3,000 (Tel)	5,500/ month (April to December)	1,888,500
Dr. M. Rezah Badal	PRS	13.01.2014 – 31.12.2014	69,280	30,000 *		1,206,640

** Allowance representing responsibility as Head of Office for Ocean Affairs and Development as from January 2014.*

Staff of the Institute

Dr. V. R. Mangipudi	Director (as from 13th January 2014 to 12th April 2015)

Scientific Staff

Dr. M. R. Badal, Graduate Stat., M.Sc. [Applied Maths and Modelling], M.Sc. [Oceanography], Ph.D. [Physical Oceanography]	Principal Research Scientist and seconded to PMO as Head of Ocean Matters Unit (as from 14 January 2013)
Dr. D. E. P. Marie, B.Sc. (Joint Hons.) [Chemistry and Environmental Studies], Ph.D. [Chemistry], Post Doc. [Chemistry]	Principal Research Scientist
Dr. K. R. Moothien Pillay, B.Sc., M.Sc. [Marine Ecology and Fisheries Biology], Ph.D. [Fisheries Science]	Principal Research Scientist
Mr. J. I. Mosaheb, B.Sc. [Marine Biology and Biochemistry]	Research Scientist
Mr. M. Singh, B.Sc. [Physics and Geology], M.Sc. [Geology]	Research Scientist
Mr. B. A. Motah, B.Sc. (Hons.) [Physics with Environmental Science], M.Sc. [Sustainable Environmental Management]	Research Scientist
Mr. P. Mussai, B.Sc. [Zoology], M.Sc. [Marine Biology and Oceanography], M.Sc. [Project Management]	Research Scientist
Mr. V. Ramchandur, B.Sc. (Hons.) [Physics], M.Sc. [Computer Security and Forensics]	Research Scientist
Mr. S. Bacha-Gian, B.Sc. (Hons.) [Biology with Plant Science], M.Sc. [Molecular and Cellular Biology]	Research Scientist
Mr. O. Sadasing, B.Sc. (Hons.) [Biology with Environmental Science], M.Sc. [Marine Biology and Oceanography]	Associate Research Scientist
Dr. H. Runghen, B.Sc. (Hons.) [Mathematics], Ph.D. [Numerical Modelling and G.I.S.]	Associate Research Scientist
Mr. A. Rawat, Ingénieur en Modélisation Mathématique et Mécanique	Associate Research Scientist
Mr. V. Bhoyroo, B.Sc. Botany, M.Sc. Botany [Spec. in Plant Biotechnology] (on leave without pay as from 12 August 2013)	Associate Research Scientist

Mr. G. Beedessee, B.Sc. [Chemistry, Zoology, Biotechnology], M.Sc. [Molecular Biology]	Associate Research Scientist (on leave without pay as from 1June 2013)
Mr. A. Ramanjooloo, B.Sc. (Hons.) [Chemistry], M.Sc. [Chemistry]	Associate Research Scientist
Mr. S. Curpen, B.Sc. (Hons.) [Biology with Environmental Science], M.Sc. [Bioinformatics]	Associate Research Scientist
Dr. P. D. Bissessur, Master 2 Recherche, DESS [Télédétection-Imagerie-Numérique], Ph.D. [Marine Geophysics]	Associate Research Scientist
Mrs. R. Sooroojebally, B.Sc. [Biotechnology]	Associate Research Scientist
Mr. K. Ramdhony, B.Sc. [Medical Technology with specialisation in Clinical Laboratory Technology], M.Sc. [Biotechnology]	Associate Research Scientist
Mr. O. Pasnin, B.Sc. (Hons.) [Biotechnology], M.Sc. [Applied Marine Science]	Associate Research Scientist
Mr. A. Nicolas, B.Sc. (Hons.) [Marine Science & Technology]	Associate Research Scientist
Miss. P. Roy, B.Sc. (Hons.) [Biotechnology (Enterprise)], M.Sc. [Molecular Medicine and Cancer Research]	Associate Research Scientist
Miss. K. Modoosoodun, B.Sc. (Hons.) [Marine Science and Technology]	Associate Research Scientist
Dr. Y. Neehaul, Master Chimie-Physique des Molecules et Interfaces, Ph.D. [Bio-physical Chemistry]	Associate Research Scientist
Ms. P. Oogarah, B.Sc. [Chemistry], M.Sc. [Pharmaceutical Analysis and Quality Control]	Associate Research Scientist
Ms. C. Lebrasse, B.Sc. (Hons.) [Marine Science and Technology]	Associate Research Scientist
Mr. O. Gooroochurn, B.Sc. (Hons.) [Biology with EVS]	Technical Officer Associate Research Scientist
Dr. D. Dumur, B.Sc.(Hons.) [Biology with Environmental Science], M.Phil [Environmental Science], Ph.D. [Environmental Science] (on contract as from 3rd February 2014)	Associate Research Scientist

IT Staff

Mr. E. Martial, B.Tech. (Hons.) [Computer Science and Engineering], M.Sc. [E-business]	Systems Administrator

Dr. D. Chuckravanen, B.Eng. (Hons.) [Electronic & Communication Engineering], MSc [Communications Engineering and Signal Processing], Ph.D. [Multiple system modelling and analysis of physiological and brain activity and performance at rest and during exercise]	IT Officer

Public Relations Office

Miss. R. Boyjoonauth, B.Sc. (Hons.) [Communication Studies], MA [Public Policy and Administration]	Public Relations Officer

Finance Staff

Mrs. R. Sobha, FCCA, MBA	Accountant
Mrs. M. Joyram, B.Sc. (Hons.) [Public Administration and Management]	Executive Officer
Mrs. N. Mudhoo	Accounts Clerk
Ms. M. Nuckchady, B.A (Hons.) [Applied Accounting]	Accounts Clerk

Administrative Staff

Mrs. L. Kureeman, B.Sc. (Hons.) [Public Administration and Management], MBA [Human Resource and knowledge Managements]	Administrative Secretary
Mrs. N. Tegally	Confidential Secretary
Mrs. A. Moonesawmy, B.A (Hons.) [Library and Information Science]	Acting Library Officer
Mrs. N. Neermul	Clerical Officer/Higher Clerical Officer
Mrs. S. Sukai	Front Desk Officer

Technical Staff

Mr. C. Samyan [PADI Dive master]	Technical Assistant/Senior Technical Assistant
Mr. S, Sunassee [Open Water Scuba Instructor, Emergency First Respond Instructor, Master Scuba Diver Trainer]	Technical Assistant/Senior Technical Assistant
Mr. R. Soobhug BSc (Hons.) [Marine Science and Technology]	Nurseryman (as from 1st March 2013 to 11th March 2014)

Support Staff

Mr. D. Munsah	Driver/Office Attendant
Mr. V. Coopen	Driver/Office Attendant
Mr. S. Seechurn	Driver/Office Attendant (Contract Basis)
Mr. V. Michel	Driver
Mrs. M. Rajiah	Handy Worker

Principal Projects

Construction of MOI Building at Albion

The new director of MOI requested the consultant to review the space planning as per new requirements in January 2014 and modifications were made accordingly.

MOI had called requests for proposals for consultancy services for the Environmental Impact Assessment (EIA) for sea water pumping from 6 selected bidders. After assessment of bids received, MOI had selected VYYAASS Consulting Engineer Ltd for award of the contract for EIA who then submitted a report.

Based on test results obtained as part of the EIA report showing the sea water characteristic at different distances from the shoreline and while representatives indicated that sea water collection point at a distance of 60m from the shoreline is acceptable, whereby the MOI is still waiting for the EIA licence.

Monitoring of Environment for Security in Africa (MESA)

The Monitoring for Environment and Security in Africa (MESA) programme is an EU-funded project under the 10th EDF with a budget of 37M EURO. It is managed by the African Union Commission and will reinforce the framework and expand the long-term cooperation and exchange between European and African stakeholders for the development of operational services based on satellite and *in situ* Earth Observation (EO) data that support environmental management and security in Africa at continental, regional and national levels. The aim of this programme is to ensure continuity of past investments on the use of EO data in Africa and to provide an initial contribution to the "Global Monitoring for Environment and Security" and Africa Initiatives. Beneficiary countries of MESA are 48 ACP countries of five African Regional Economic Communities: CEMAC, ECOWAS, IGAD, IOC and SADC.

The Mauritius Oceanography Institute (MOI) has been entrusted, as was the case during the African Monitoring of Environment for Sustainable Development (AMESD) project, to be the Implementation Centre for the Indian Ocean Commission (IOC) THEMA which consists of IOC member states and neighbouring countries of the Mozambique Canal. MOI will focus on the theme Marine and Coastal Management and deliver the following Information Services:

- **Service 1: Marine Resources Management**

This service will provide oceanographic charts for the detection of potential fishing zones and for monitoring the state of the ocean.

- **Service 2: Monitoring of Coastal Environment**

This service will provide operational marine information through the deployment of wave data buoys and assess the vulnerability of the coastlines of the IOC countries using the Coastal Vulnerability Index.

The IOC Thematic grant to the tune of 1.7 million EURO has been signed between the MOI, the European Union and the African Union Commission on 25th March 2014.

Launching of MESA Project for the IOC Region

The Mauritius Oceanography Institute and the Indian Ocean Commission officially launched the Pan-African Monitoring for Environment and Security in Africa project for the South West Indian Ocean region at the Hennessy Park Hotel in Ebène, Mauritius on Monday 23rd June 2014. Some 60 participants coming from Comoros, Mauritius, Madagascar, Mozambique, Kenya, Reunion Island, Seychelles and Tanzania including high officials from the Ministry of Environment and Sustainable Development, the Ministry of Fisheries and the Mauritius Meteorological Services were also in attendance.

Political and Policy Development Frameworks

The first MESA Regional Steering Committee for the Indian Ocean Commission region was held at the seat of the IOC on the 24th June 2014 in Ebène. This meeting which was chaired by the IOC, gathered the National Focal Persons of the participating states, representatives of the Mauritius Oceanography Institute, the Regional Implementation Centre, as well as the representative of the MESA Technical Assistant Team.

The role of the Regional Steering Committee is to ensure that the programme utilises the region's political institutions and receives appropriate support from the highest levels of national policy and decision makers. Several presentations covering different topics were delivered during the meeting. A set of recommendations and conclusions were formulated at the end of this one-day workshop.

Capacity Building

Strengthening the capacities of the MOI regional technical partners in the processing and analysis of Earth observation ocean data for the management of marine and coastal resources is an important component of the MESA-IOC THEMA. In this respect, the MOI organised a regional Technical Workshop from the 3rd to 7th November 2014 at the MOI in Quatre Bornes, Mauritius.

12 delegates from Comoros, Madagascar, Mauritius, Kenya, Mozambique, Seychelles and Tanzania attended the workshop. The MOI team provided training on how to troubleshoot and repair the AMESD Station and how to use sea surface currents as a new parameter for generating more refined Potential Fishing Zone advisories.

Cooperation between ECOWAS and IOC regions

It is foreseen under MESA to "Improved cross-fertilisation (geographically and thematically) and cooperation, both among regions on the African continent and with European partners, in the interest of synergised, efficient, and integrated information services on a continental scale."

Considering the successful implementation of the marine THEMA by the MOI during AMESD, the Economic Community of West African States (ECOWAS), specifically requested for a similar service during the implementation of MESA.

As part of MESA "cross-fertilisation" efforts, the Mauritius Oceanography Institute has been collaborating with the University of Ghana, the designated ECOWAS Regional Implementation Centre for providing EO services for managing coastal and marine resources in West Africa.

3 MOI staff were invited by the University of Ghana to support the University personnel in adapting AMESD-IOC services to the West Africa region. During the visit from the 19th to 23rd May 2014, the MOI team provided technical support to their counterparts on the AMESD station and the IOC Services. The University of Ghana staff exchanged with MOI methods for generating primary productivity charts and introduced to the MOI team the methodology used for developing coastal vulnerability indices in Ghana and transferable to the IOC. The MOI is pleased to announce that the mission in Ghana was a success.

The MESA-IOC project is managed by a technical team led by Mr. E. Martial and consisting of Messrs. J. I. Mosaheb, V. Ramchandur, B. A. Motah, O. Sadasing, H. Runghen, D. Bissessur, A Rawat, O. Gooroochurn, D. Chuckravanen and Ms. K. Modoosoodun along with the technical assistance provided by Dr. F. Wernerus from the MESA Technical Assistance Team as well as Ms. R. Boyjoonauth, Mrs. N. Mudhoo and Mrs. R. Sobha.

Coral culture and Reef Rehabilitation

Coral reefs are vital for coastal protection, preservation of biodiversity as well as the fisheries and the tourism industries. However, reefs worldwide are at risk from climatic changes and anthropogenic impacts. In Mauritius, its coral reefs are facing numerous environmental challenges. For the past few years, a significant decrease in live coral cover has been registered around the island. In response to this continuous reef degradation, the Mauritius Oceanography Institute (MOI) initiated in 2008, a land- based coral farming project and in 2012 a small scale reef rehabilitation project, during which techniques have been developed for land based culture of corals, culture of corals en masse for reef rehabilitation, and small scale reef rehabilitation

Mass coral culture and small scale reef rehabilitation

In 2012, locally-adapted multi-layered rope nurseries were set up in-situ for mass propagation of selected fast-growing, bleaching-resistant and resilient coral species at Albion (ALB) and Flic en Flac (FEF) in 2012 and in 2013 at Trou aux Biches (TAB) in collaboration with ELI Africa with financial support from the GEF-SGP, implemented by UNDP. In mid-2014, the nursery-reared corals from all three sites were transplanted to selected recipient reef sites on either (i) natural substrates and/or (ii) locally-adapted artificial reef rehabilitation modules (ARRMs) (Figure1). A total of ~6200, ~4000 and ~1000 small nursery-grown coral colonies have been transplanted over an area covering 300m2, 350m2 and 150 m2 at ALB, FEF and TAB respectively.

Figure 1: MOI's locally adapted ARRM at Flic en Flac

The community- based reef rehabilitation project with ELI Africa at TAB ended in September 2014. A final project report was submitted by the MOI to UNDP GEF-SGP in October 2014.

Overall results showed that most species under mass culture at ALB and FEF had a survival rate >50%, whereas it was < 50% at TAB, except for two species. The Pocilloporidae family *(Pocillopora damicornis, P.eydouxi and P.verrucosa)* showed highest survivorship (>70%) while lowest survivorship (<35%) was recorded for Galaxea fascicularis (Figure 2). Of the cultured

Acroporidae corals *(Acropora austera, A.formosa, A.humilis, A.latistella and A.selago)*, *A.formosa* showed the lowest survivorship (45% to 0%), irrespective of sites. With reference to coral growth rates recorded at the three study sites, no significant difference was recorded between nursery-reared corals and transplanted colonies ($p>0.05$). Among *Acroporidae* and *Pocilloporidae* families, *A.austera* (linear growth rate; 27.23 ± 4.44 mm/yr) and *P.verrucosa* (planar growth rate; 1422.78 ± 89.91 mm^2/yr) had the highest growth rates in nurseries. Predation by fish and Drupella snails, and algal overgrowth were the main causes of coral mortality in nurseries and on ARRMs.

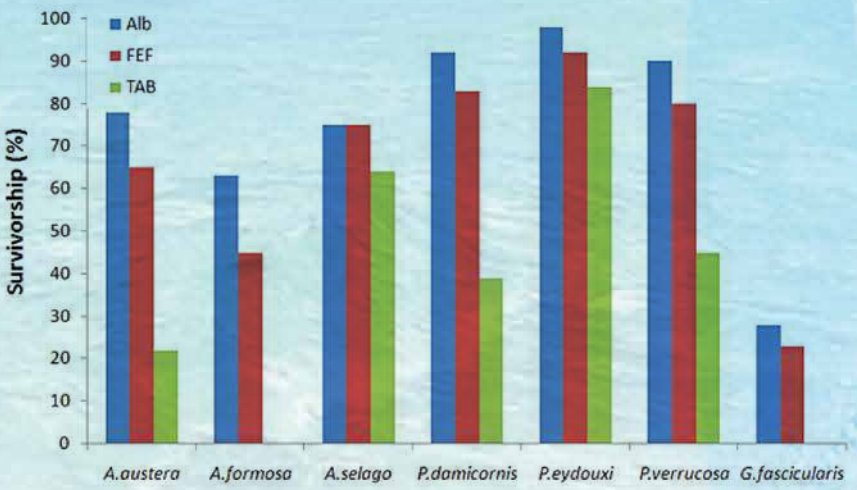


Figure 2: Percentage survivorship for corals under mass culture at Albion (Alb), Flic en Flac (FEF) & Trou aux Biches (TAB) (Data from Aug-13 to May-14) (n=60-90)

Coral reef monitoring

The study of coral species responses to environmental stressors continued through 2014 at fifteen permanent monitoring sites around the island (Figure 3). Data collected at these sites were substrate cover, coral species composition, temperature and Photosynthetic Active Radiation (PAR) (at only one site).This study generates the following long term data:

(1) coral cover and coral species composition

(2) sea water temperature and PAR

Figure 3: Location where permanent monitoring stations have been deployed

Data generated from this study will:

(1) be used in complementarity with other ecological and biological studies to understand vulnerability, degradation and resilience of coral reefs in Mauritius

(2) be fed into the multidisciplinary studies of the MOI for understanding processes and phenomena that drive coastal dynamics

(3) help in identification of suitable sites for implementation of small scale reef rehabilitation projects

(4) enable the identification of species most susceptible to environmental changes for conservation initiatives

(5) give insight into ecological processes that underlie reef resilience

(6) be useful to understand climate change impacts on coral reef ecosystem

This project is being implemented by Dr. R. Moothien Pillay and Mr. S. Bacha Gian

Assessment of Marine Living Resources using DNA (DNA barcoding)

The marine ecosystems are globally impacted by man-induced threats as well as natural phenomena including climate change. As a consequence, marine biodiversity is in decline, with the wide speculation that the rate of species loss will exceed that of species documentation. The marine ecosystem in Mauritius is no exception, as it faces continuous coastal habitat degradation and over-exploitation of its marine living resources.

Initiated in 2010, this project aims at establishing an inventory of commercially important marine species in the waters of Mauritius using a combination of both, traditional taxonomic identification tools and DNA based identification techniques.

Assessment of commercial fish diversity

The commercial fish diversity assessment started in 2010 and has now been completed, except for occasional uncommon/rare fish specimens that are subsequently analysed. During the course

Figure 1: Guide of commercial fish from family Serranidae. Identification was carried out using both morphological features and the DNA barcode sequence of each species.

of the inventory, fish specimens were collected from local markets, fish landing stations and during expeditions to St Brandon and identified based on their morphological characteristics. The biomarker, Cytochrome c Oxidase subunit I (COI) gene, was then used for validating the identity of each species. Overall, 307 specimens were sequenced, edited and analysed. The results have revealed the presence of 186 commercial fish species distributed over 107 genera and 46 families. While 41 of the 186 species have not been previously reported from Mauritius, 3 may be potentially new species. Identification of the potentially new species would require further morphological and genetic investigations. Based on results obtained from this project, the MOI is currently in the process of drafting a series of family wise posters to serve as market fish guides. A template of the market fish guide for the family Serranidae is shown below (Fig.1).

Provision of services

The MOI has also been involved in the provision of services to the Fishing industry for DNA based species identification of frozen fish tissue samples. So far, 108 frozen fish tissue samples have been analysed, with most of the specimens identified to either *Thunnus albacares* (Yellowfin Tuna) and *Katsuwonus pelamis* (Skipjack Tuna).

Assessment of Holothurian diversity (sea cucumbers)

The inventory of sea cucumbers started in 2012 and is ongoing. Until now, 83 specimens of sea cucumbers have been collected. Besides the record of important morphometric data, DNA extractions and spicules examinations have been also conducted on each specimen sampled. However, amplification of the COI genetic marker was successful in only 23 samples. Further work will involve testing COI amplification techniques for sea cucumbers and also sampling of nocturnal sea cucumber groups.

All data generated from the project are uploaded on the online marine diversity and genetic database.
(http://www.mdgdb.com).

This project is being undertaken by Dr. R. Moothien Pillay, Mr. S. Curpen and Dr. D. Dumur.

Biological activities of marine natural substances from Mauritius waters

Fig 1: Fractionation of crude extract from the sponge *Pericharax sp* using MPLC (Medium Pressure Liquid Chromatography)

This project aims at investigating the vast richness of Mauritius Marine Resources for the development of the Mauritian Ocean Economy in the field of discovering new drug leads for the treatment of human diseases such as Cancer, Alzheimer and Diabetes Mellitus. Efforts are now being spurred towards the filing of patents which involved the full characterisation and unveiling of mechanism of action of the bioactive isolates. Along this drive, the studies on biological activities of extracts from marine sponges performed in 2014 have obtained tantalising results as described below.

In 2014, total and selective extractions have been performed on 33 sponges resulting in 109 extracts and we hope to complete the extraction of the remaining sponges at the end of 2015. These extracts will eventually be tested for their biological activities. Additionally, the extracts from certain sponge specimen have shown significant activities on nine human cell lines some extracts have shown the ability to cause cancer cell death at very low concentration, making them potential drug lead. Moreover, the mechanism of action of other extracts, with interesting activity, was investigated and indicated that they have the ability to induce a cell death mechanism in cancer cell. The same extracts also showed potent anti-Alzheimer activity. Eleven (11) compounds (mass ranging from 0.4 to 3.8 mg) were isolated from this sponge species. However, the isolation process has to be repeated so as to get substantial amounts of the isolates, enough for us to afford further biological testing and structural determination.

The antioxidant capacity of compounds has been related to the prevention of several diseases including cancer, coronary heart diseases, inflammatory disorders, neurological degeneration, and aging. The anti-oxidant activity of marine sponges has rarely been studied. We performed this assay on 49 sponges from Mauritius Waters. Indeed, this will definitely contribute to the biological investigation of sponge extracts. To date, 147 sponge extracts obtained from 49 sponges have been tested for their anti-oxidant activity. Furthermore, the total phenolic content

of the extracts was also determined. The results obtained revealed that some of the extracts from marine sponges are promising source of natural anti-oxidants.

We have published two scientific papers in 2014 as follow:

1. Ramanjooloo, A., Cresteil, T., Lebrasse, C., Beedessee, G., Oogarah, P., Van Soest, R. W., & Marie, D. E. (2014). α-Glucosidase inhibitory activity of marine sponges collected in Mauritius waters. Natural product research, 1-5.

2. Govinden-Soulange, J., Marie, D., Kauroo, S., Beesoo, R., & Ramanjooloo, A. (2014). Antibacterial Properties of Marine Sponges from Mauritius Waters. *Tropical Journal of Pharmaceutical Research,* 13 (2), 249-254.

This project is being undertaken by Dr. D. Marie with the assistance of Mr. A. Ramanjooloo, Ms. P. Roy, Ms. P. Oogarah, Ms. C. Lebrasse as well as Dr. Y. Neehaul occasionally.

Assessing the Submarine Groundwater Discharge Flux to Meet Potable Water Demand and Improve Domestic Water Supply in Coastal Regions

Mauritius relies heavily on groundwater as a source of freshwater for domestic usage. Since a considerable part of ground water is lost at sea through submarine groundwater discharge (SGD), the main goal of this project was to investigate the locations of SGD around the island and also quantify the flux of SGD in specific regions of high freshwater demand. Furthermore SGD plays an important role for the sustainability of marine ecosystem as it is a unique source of essential minerals required for the proper growth of marine organisms. Nevertheless, the absence of proper sewage systems and the lack of control of industrial wastes have contributed to the deterioration of SGDs in many countries.

This project is co-funded by the International Atomic Energy Agency (IAEA) and performed in collaboration with the Water Resources Unit and the National Environmental Laboratory. A multidisciplinary approach is adopted with techniques involving the measurement of naturally occurring radioisotopes 222Radon and Radium. The investigation has been divided in two distinct parts: Firstly a multidisciplinary approach was used to identify and confirm the SGD sites around Mauritius and secondly a more detailed investigation of the sites, for example Trou aux Biches, (Figure 1) was done to determine the flux of SGD in this region.

Figure 1: In the lagoon of Trou aux Biches, both distinct (left) and dispersed discharge (right) are observed.

There are three natural proxies that are used to identify SGD; salinity, temperature and 222Radon. The strategy to identify the major SGDs around Mauritius is based on satellite sea surface temperature differential imagery between summer and winter for a period of ten years. The result is a map of Mauritius showing temperature anomalies at thirty seven sites which are suggested to be SGD sites. These sites are being investigated individually to account for

the temperature anomaly and to confirm the presence of groundwater discharge. La Prairie is one example of the sites under investigation shown here in Figure 2; the blue pixels are regions whereby the SST is lower compared to the normal average SST. This site was confirmed to be a SGD site. On completion, this investigation will result in the generation of a map of Mauritius showing all the major SGD sites which could be a tool for the management of fresh water distribution and utilization in Mauritius.

A

B

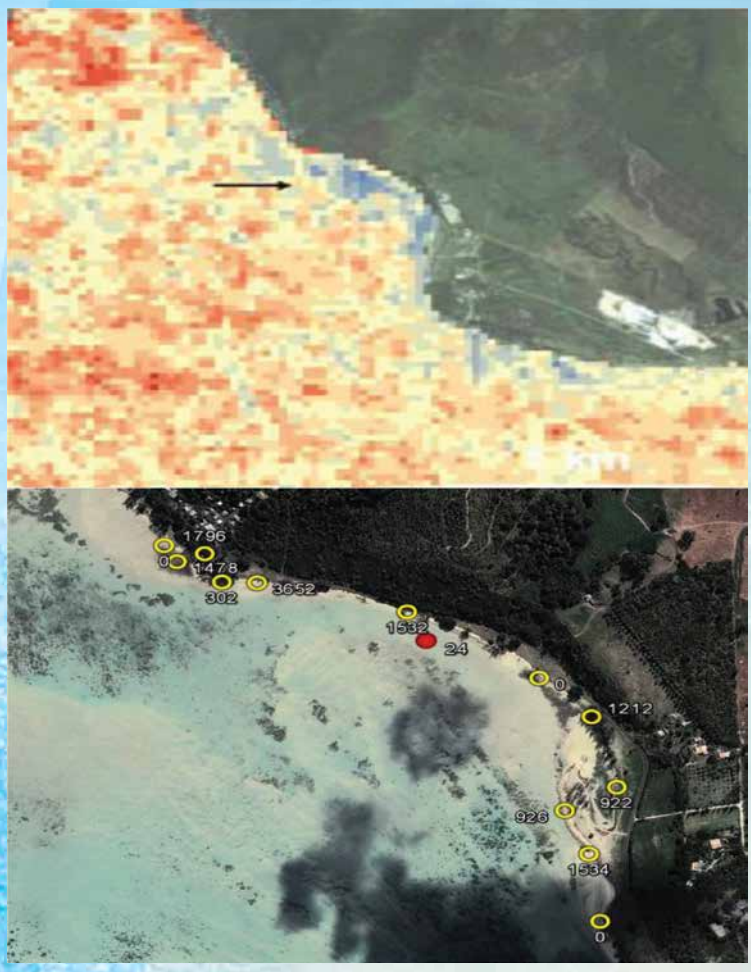


Figure 2: Sea surface temperature differential imagery at La Prairie shows a potential SGD site (A). 222Radon measurement (Bq/m3) seen in B confirmed the presence of SGD.

This project is being undertaken by Dr. D. Marie and Dr. Y. Neehaul.

Study of the Quaternary Geomorphology of Mauritius

A 10m elevation contour map was used to decipher the areas geomorphologically prone to inundation in a worst-case scenario caused by Tsunami and sea-level rise.

The project will enter phase II with more detailed objectives giving emphasis on the past 10,000 years.

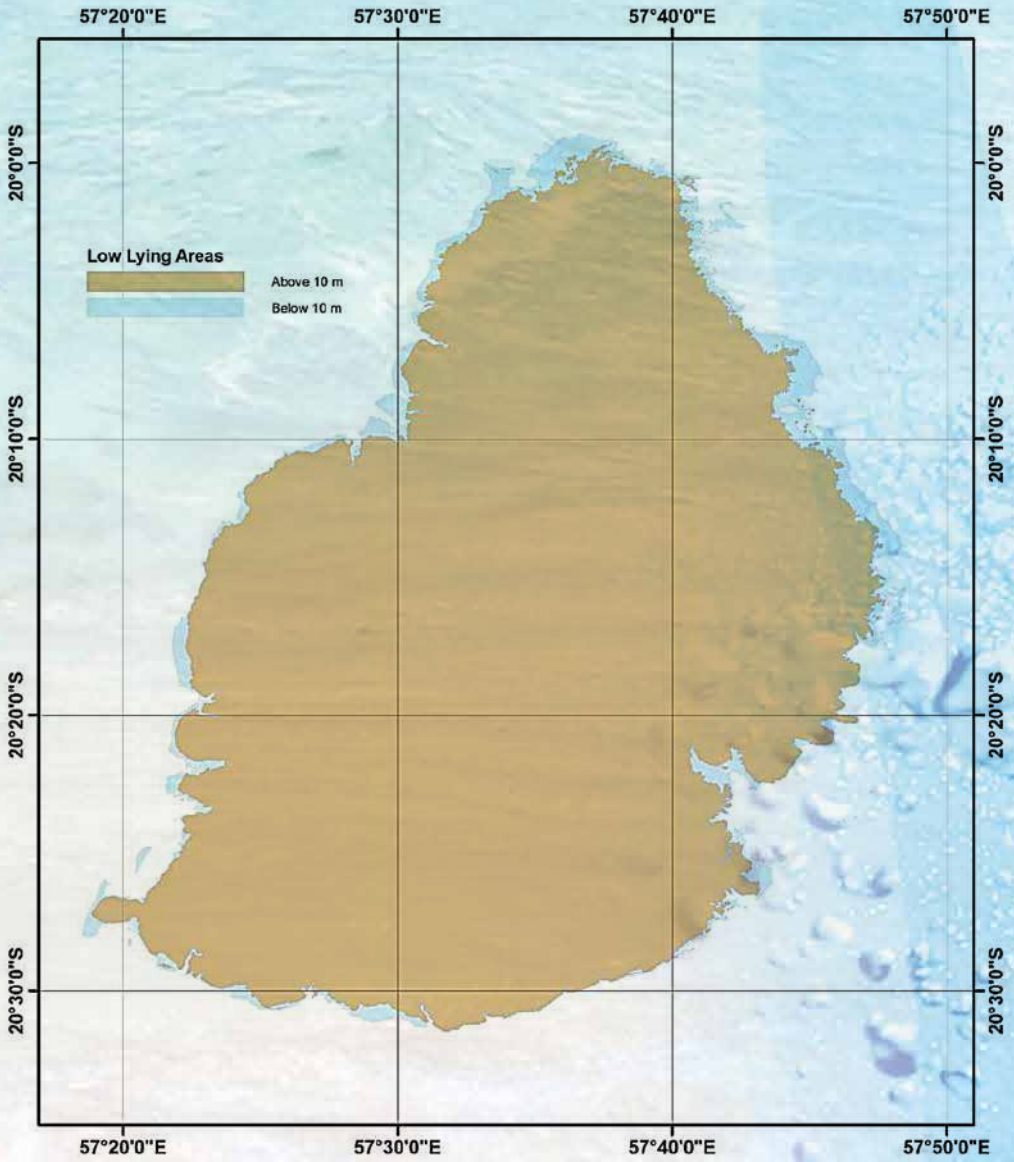


Fig1. Map of Coastal Areas below 10 m elevation

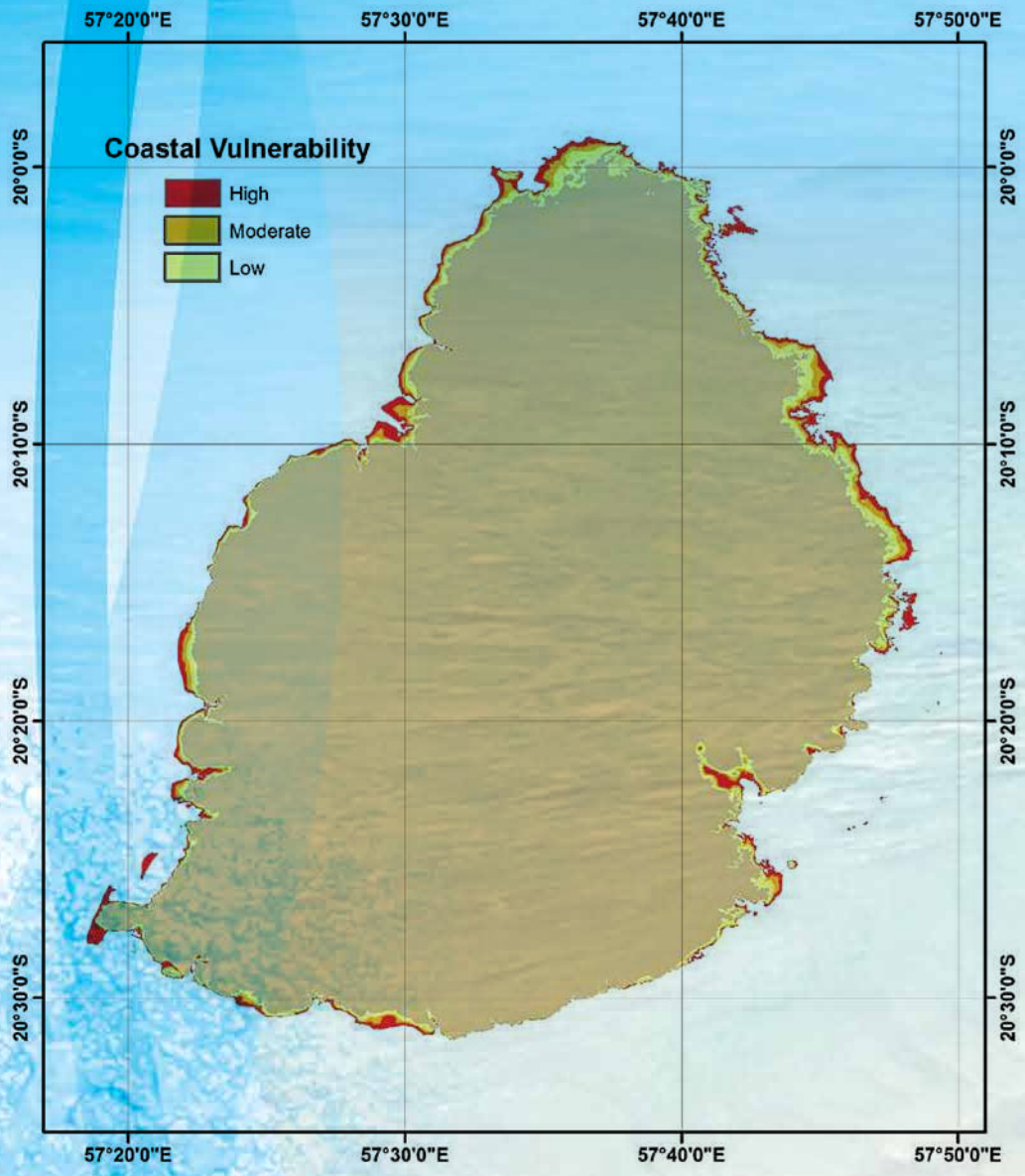


Fig2. Map Coastal vulnerability

Assumptions and limitations:

- The elevation data used in the study is 10 m interval, the contours between 10 m and coast were estimated based on the kriging interpolation.
- The vulnerability map has been prepared based on the holistic approach.
- The basic assumption is that the run-up heights of 2 m can inundate up to 2 meter elevation contour.
- Maximum tsunami run up 0.6 m observed during 1883, it was assumed the 1 meter tsunami run up may be expected
- The NOAA sea level observation for Mean Sea Level Trend for Port Louis, Mauritius is 3.51 +/- 1.15. it is rounded to 5 mm per year. The sea level after 100 years will rise up to 0.5 m.

- Considering the tsunami run up 1 m and future sea level 0.5 meters the tsunami can cause damage up to 1.5 m contour line.
- The data sensitivity may 0.5 meter added
- The total 2 meter is the expected run-up height of tsunami after considering the future implication of sea level rise.
- Coastal areas up to 2 meter are vulnerable for tsunamis in the Mauritius.
- Tsunami model has been performed for the 2004 Indian Ocean Tsunami event but, initial results not showing any significant run-up heights for the Mauritius coast.

Beach erosion and lagoon dynamics

Sandy beaches are the dominant features of most of the world's ice-free coastlines. They are the products of deposition, erosion, and sediment transport. Sand is constantly being moved on and off along the coastline by everyday winds, waves, and currents that shape and reshape coastlines resulting in beach erosion or accretion.

Erosion of the beach is a worldwide phenomenon, which is influenced by natural, physical and morphological processes. The misbalance of the beaches due to erosion or accretion is definitely having an impact around the world as well as in Mauritius.

The Mauritian coastal zone, which stretches over a distance of about 322 km with a lagoon area of 243 km^2 surrounding it, is also experiencing erosion. The coastline is undergoing pronounced morphological changes as a result of natural causes and anthropogenic activities. The degradation of coastal zone is one of the major environmental problems facing the island with coastal erosion as the most acute and pressing one.

The tourism industry, which is one of the major pillars of our economy, is almost entirely coastal-based. Any degradation of the marine environment has a negative impact on this industry, hence the pressing need for proper management of the coastal zone. The coastal zone is an important resource for Mauritius, and with the development of the tourism industry over the past 30 years the preservation of the marine environment was considered secondary. There has been a gradual degradation of the coastal zone due to the consequences of rapid development of the coastal zones, insufficient precautionary measures taken, adding to that the growing effetcs of climate change.

This continuing degradation of our beaches is leading to a rapid change of the coastline. And this has a significant impact on the coastal associated economic activities such as tourism and fishing. To address the phenomena of beach erosion we need to monitor the beach evolution and determine its interaction with the lagoon. How is the beach being eroded? What is the effect of the lagoon currents and waves on the sand input and retreat on the beaches? Where is the sand being washed away (in the lagoon or outside the lagoon)?

In this prospect, the MOI is carrying out a study on the topic at different public beaches around Mauritius to help address these issues. The objectives of the project are to monitor the beach evolution, study the lagoon dynamics, map the lagoon habitats and analyse the beach-lagoon system and its interaction in order to properly understand and follow up the coastal changes for the purposes of maintaining and developing their economic value for a sustainable development in accordance with the economic development of the country.

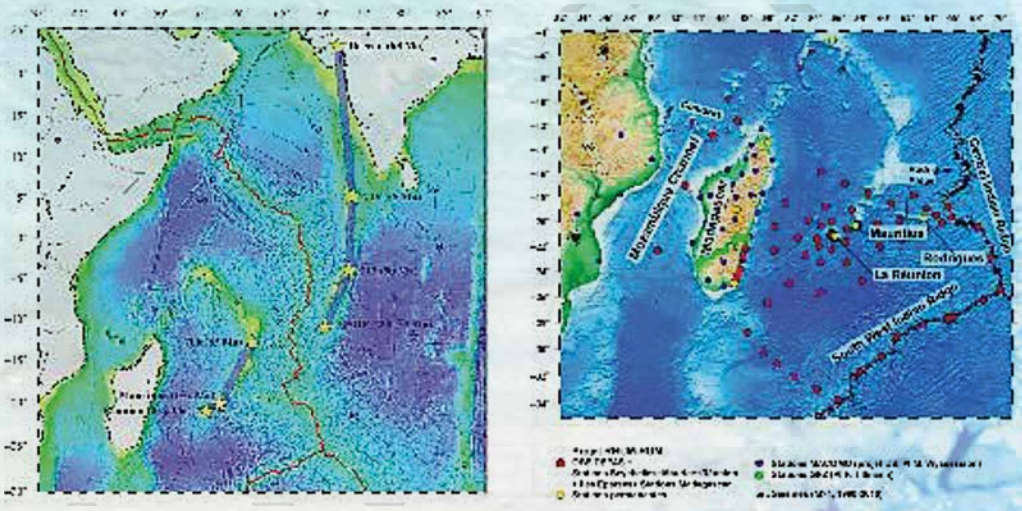
This project is being led by Dr. D. Bissessur with the technical assistance of Messrs. O. Gooroochurn and O.Pasnin.

RHUM-RUM Project

RHUM-RUM is a French-German passive seismic experiment designed to image an oceanic mantle plume from crust to core beneath Réunion Island, and to understand these results in terms of material, heat flow and plume dynamics.

The Réunion hotspot is one of the most active volcanoes in the world, and its track leads unambiguously to the Deccan Traps of India, one of the largest flood basalt provinces on Earth, which erupted around 65 Ma ago (figure 1a). The genesis and the origin of the mantle upwelling and of the hotspot are still very controversial.

The experiment combines observations at sea (cruises RHUM-RUM 2012 and 2013) and on land to obtain a high-resolution image of the structures of the mantle underneath the SW Indian Ocean, and more precisely underneath Réunion hotspot (figure 1b).



Specific research proposals, MOI in collaboration with IPGP, included in RHUM-RUM project are:

- the study of the structure and evolution of Mauritius island
- the synthesis of multibeam bathymetry data around the Mascarene islands
- the synthesis of magnetic data around the Mascarene islands

The team:

- France: Institut de Physique du Globe de Paris, Géosciences Réunion, Observatoire Volcanologique du Piton de la Fournaise, Géosciences Montpellier, Université de Brest, FAST – Orsay, Géosciences Azur, EOPG Strasbourg.
- Germany: Universities of Munich, Frankfurt, Kiel, Bremerhaven, Muenster, Bonn.
- Indian Ocean countries: Mauritius Oceanography Institute, Mauritius; University of Antananarivo, Madagascar, Seychelles Petroleum (SEYPEC), Seychelles.

Staff Training

1. **ODINAFRICA Training Course on Marine Biodiversity Data Management, Belgium, 17th to 21st March 2014 –** ***Messrs. P. Mussai & S. Curpen***

2. **Training Programme "Transforming The Public Sector Through The National Blue Ocean Strategy" from 9th to 27th June 2014 organised by The National Institute Of Public Administration of Malaysia under The Malaysian Technical Cooperation Programme (MTCP) –** ***Mrs. B. Rajahbalee-Cader***

3. **Indian Ocean Rim Association (IORA)-Workshop on establishing a Centre of Excellence (CoE) on Ocean Sciences and Environment for the Indian Ocean Rim countries, Colombo, Sri Lanka from 30th June to 1st July 2014 –** ***Dr. K. Ruby Moothien Pillay***

Participation in International Conferences and Meetings

1. **1st Emerging Knowledge for Local Adaptation Planning and Assessment workshop held at the CSIR, Durban, South Africa from 19-23 May 2014 -** ***Dr. K. Ruby Moothien Pillay***

2. **Report of the "Pre-Climate Outlook Forum" workshop held on 11-15 August 2014 – Nairobi, Kenya –** ***Dr. D. Bissessur & Mr. A. Nicolas***

MESA Activities

1. **Second meeting of the MESA Technical Experts Meeting African Union -Addis Abeba –Ethiopia, 3-7 Feb 2014 – *Mr. J. I. Mosaheb***

2. **Mission in Ghana for collaborative actions under the MESA Project, (University of Ghana, East Legon, Accra, Ghana, 19th – 23rd May 2014) – *Messrs E. Martial, V. Ramchandur & A. Rawat***

3. **3rd Technical Experts Meeting, (Errata Hotel, Accra, Ghana, 2nd - 4th July 2014) – *Mr. E. Martial***

MAURITIUS OCEANOGRAPHY INSTITUTE

Scientific Expeditions

1. **Survey on Raphael Island, Cargados Carajos Archipelago, 15th to 16th May 2014 – *Messrs. O. Pasnin & K. Ramdhony***

2. **SO235 SONNE-OASIS Expedition: Port Louis – Malé, 23 July – 07 August 2014, *Dr. D. Dumur***

Events

World Oceans Day

This year, to mark the celebrations of World Oceans Day 2014 under the theme "Together we have the power to protect the ocean!", the Mauritius Oceanography Institute (MOI) youth, various coastal communities and the general public and interacted and conveyed the message how to protect the ocean and illustrate the importance of oceanography for a small island developing state, like Mauritius.

The oceans, a critical component of the biosphere, which power our climate, are essential to food security as well as the health and survival of all life. It is, thus, up to each one of us to help ensure that our oceans are protected and conserved for future generations. Despite being so vital to us every day, they are all too often overlooked and taken for granted. World Oceans Day provides an opportunity to focus special attention on our world's shared oceans and allows us to celebrate our personal connection to the sea, as well as to raise awareness about the crucial role the ocean plays in our lives and the increasingly critical need for each of us to help conserve its wonders and for the sustainable use of its resources.

The MOI organised a beach clean-up and planting of mangroves at Rivière des Galets on Friday 6th June 2014 by inviting the youth including students from the BPS College as well as from the Faculty of Agriculture, University of Mauritius. A sensitisation campaign was also held at the public beach of St. Felix on Sunday 8th June 2014, whereby displays were set up to show case the importance of oceanography and the activities linked to it.

The objectives were to:-

- sensitise people on how to optimise the use of an ecosystem without damaging it
- create an understanding as well as to promote public awareness of the ocean and the current challenges faced by the community in connection with marine biodiversity;
- to reach out to youngsters to become caretakers of our oceans and to conserve them for our future;
- to apprise the community of the importance of the oceans in relation to food security, health, the survival of all life, climate change, the environment as well as sustainable development

Collaborating partners included the Beach Authority, the University of Mauritius, National Coast Guard, Mauritius Police Force, District Council of Savanne, the Central Electricity Board, the BPS College, Hotel Shanti Maurice, the NGO "Association pour le Développement Durable (ADD)" and St. John Ambulance.

Launching of the "Monitoring for Environment and Security in Africa (MESA)" Project on 23rd June 2014, Hennessy Park Hotel, Ebène

The Mauritius Oceanography Institute (MOI) and the Indian Ocean Commission (IOC) officially launched the Pan-African "Monitoring for Environment and Security in Africa (MESA)" project at the Hennessy Park Hotel in Ebène, Republic of Mauritius on Monday 23rd June 2014. The Minister of Environment and Sustainable Development, the Honourable Mr. Devanand Virahsawmy, the Secretary General of the IOC, Mr. Jean-Claude de l'Estrac, Mrs. Corinne Paya, Project Manager and Representative of the Delegation of the European Union to the Republic of Mauritius, for the Union of the Comoros and the Republic of Seychelles and the Director of MOI, Dr. Mangipudi Venkata Ramana were present at the opening ceremony.

In his opening speech, Mr. Virahsawmy, recalled that climate change is having serious repercussion on the economic competitiveness of Small Islands Developing States (SIDS) and is affecting them on their respective sustainable development pathways. In that context, Mr. Virahsawmy pointed out that the pooling of resources and the exchange of information at regional and sub-regional levels in line with the principles of AMESD-MESA are of utmost importance. "It is crucial for our countries to facilitate access to Africa-wide environmental information derived from Earth observation technologies", he said.

For his part, Mr. de L'Estrac, said that the MESA project forms part of a technological upgrading of sustainable development in Africa, while adding that the MOI and the IOC have been mandated by the African Union Commission (AUC) to steer and monitor marine resources management through Earth satellite data. Through MESA, several countries would be able to collaborate together thus creating a network of centres of excellence with regards to sustainable development.

Dr. M.V. Ramana, Director of the MOI, in his welcoming address mentioned that the overall objective is to help institutions and policy makers of the IOC member states and the neighbouring countries of the Mozambique Canal to make better use of EOD for an improved management of marine and coastal areas. He further stated that he is convinced that cooperation would be promoted within the IOC region and across African countries.

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Mrs. Paya emphasized on the willingness of the European Union (EU) to support Africa and Indian Ocean countries. She added that there is a need for regional organisations to maintain a strong involvement in the oversight and decision-making processes as well as to ensure that mechanisms are put in place for future sustainability in their respective regions.

Besides introducing the project to all key stakeholders, the meeting gave an overview of the services and products proposed under the MESA-COI-MOI thematic action and also provided opportunities to meet with the different regional partners. Themes on the agenda included an overview of the MESA programme, Marine and Coastal Management THEMA, improved tools for detection of potential fishing zones, introduction to Integrated Coastal Zone Management, roles and responsibilities of participating institutions, and coastline change survey by remote sensing.

Some 60 participants attended the workshop including high officials from the Ministry of Environment and Sustainable Development and the Mauritius Meteorological Services as well as a representative of the Ministry of Fisheries.

Participating countries included Comoros, Mauritius, Madagascar, Mozambique, Kenya, Reunion Island, Seychelles and Tanzania.

REPORT OF THE DIRECTOR OF AUDIT TO THE BOARD OF THE MAURITIUS OCEANOGRAPHY INSTITUTE

Report on the financial statements

I have audited the accompanying financial statements of the Mauritius Oceanography Institute, which comprise the statement of the financial position as at 31 December 2014, and the statement of financial performance, statement of changes in net assets/equity and the statement of cash flow for the year then ended, and a summary of significant accounting policies and other explanatory notes.

Management's responsibility for the financial statements

Management is responsible for the preparation and fair presentation of these financial statement in accordance with International Public Sector Accounting Standards and in compliance with the Statutory Bodies (Accounts and Audit) Act, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud and error.

Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with International Standards of Supreme Audit Institutions. Those standards require that I comply with the ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements.The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessment, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Opinion

In my opinion, the financial statements give a true and fair view of the financial position of the Mauritius Oceanography Institute as at 31 December 2014, and of its financial performance and its cash flows for the year ended in accordance with International Public Sector Accounting Standards.

Report on Other Legal and Regulatory Requirements

Management's Responsibility for compliance

In addition to the responsibility for the preparation and presentation of the financial statements described above management is also responsible for ensuring that the activities, financial transactions and information reflected in the financial statements are in compliance with the authorities which govern them.

Auditor's responsibility

In addition to the responsibility express an opinion on the financial statements described above, my responsibility includes expressing an opinion on whether the activities, financial transactions and information reflected in the financial statements are, in all material respects, in compliance with the authorities which govern them.

I believe that the audit service I have obtained is sufficient and appropriate to provide a basis for my opinion.

Opinion on Compliance

Public Procurement Act

The Institute is responsible for the planning and conduct of its procurement. It is also responsible for defining and choosing the appropriate method of procurement and contract type in accordance with the provisions of the Act and relevant Regulations. My responsibility is to report on whether the provisions of Part V of the Act regarding the Bidding Process have been complied with.

Opinion

In my opinion, the provisions of Part V of the Act have been complied with as far as it appears from my examination of the relevant records.

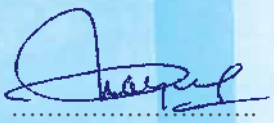
K.C TSE YUET CHEONG (Mrs.)
Director of Audit

National Audit Office
Level 14,
Air Mauritius Office
Port Louis

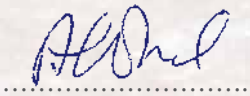
MAURITIUS OCEANOGRAPHY INSTITUTE

STATEMENT OF FINANCIAL POSITION
AS AT 31 DECEMBER 2014

	Notes	Year ended 31 December 2014.	Year ended 31 December 2013. Restated
ASSETS		**Rs**	**Rs**
Current Assets			
Cash and cash equivalents	10	19,192,894	16,615,141
Trade and other receivables	11	510,468	296,124
Other current assets - car loan		812,714	877,000
Payment on Account - construction of building	12	47,884,926	5,836,920
		68,401,002	23,625,185
Non-current assets			
Property, plant and equipment	13	14,378,680	16,248,050
Intangible assets	14	395,011	395,011
Other - car loan	15	1,831,799	2,358,322
		16,605,490	19,001,383
Total assets		85,006,492	42,626,568
LIABILITIES			
Current liabilities			
Government Grant		2,700,568	4,247,960
Payables	16	221,898	436,410
Employee benefits	17	704,354	627,745
Projects		16,674,072	15,368,806
Short-term provision - car loan		812,714	877,000
		21,113,606	21,557,921
Non-current liabilities			
Long-term provision-car loan		1,831,799	2,358,322
Donation from AMESD project		4,645,307	6,422,412
Employee benefits		7,522,594	3,527,069
		13,999,700	12,307,803
Total liabilities		35,113,306	33,865,724
Net Assets		49,893,186	8,760,844
NET ASSETS/EQUITY			
General Fund		49,893,186	8,760,844
Total net assets/equity		49,893,186	8,760,844



Mr R H Prayag
Chairman



Mr A Kokil
Board member

STATEMENT OF FINANCIAL PERFORMANCE

FOR THE YEAR ENDED 31 DECEMBER 2014

		Year ended 31 December 2014.	Year ended 31 December 2013. Restated
REVENUE	**Notes**	**Rs**	**Rs**
Income	**18**	84,877,769	52,229,683
Research income		14,317,020	18,885,183
		99,194,789	71,114,866
EXPENDITURE			
Research Work	**19**	14,512,175	18,885,183
Salaries and Allowances	**20**	31,259,689	25,091,194
Office and Administrative	**21**	5,294,773	5,746,006
Legal and Professional fees	**22**	139,100	147,000
Training and Seminars	**23**	337,369	754,413
Depreciation		6,519,341	7,117,796
Total expenses		58,062,447	57,741,592
SURPLUS FOR THE PERIOD	**26**	41,132,342	13,373,274

MAURITIUS OCEANOGRAPHY INSTITUTE

Statement of Changes in Net Assets/Equity
for the Year Ended 31 December 2014

		Restated
	Rs	**Rs**
Balance at 1 January 2014	8,760,844	(4,612,430)
Surplus/Deficit for the period	41,132,342	13,373,274
Balance as at 31 December 2014	49,893,186	8,760,844

Due to a change in Accounting Standards, from IAS 20 to IPSAS 23, reserve has increased considerably for year end 31.12.14 as all amount received as capital grant is recognized in the income statement.

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Statement of Reconciliation of Actual Amounts and Financial Statements

for the year ended 31 December 2014

	Actual paid-cash Rs	As per FS Rs	Difference reconciled Rs	Remarks
Salaries/Other Staff Related cost	25,010,261.06	28,336,968.98	- 3,326,707.92	Vacation provision & other adjustments
Other Charges - Recurrent	-			
Travelling and Transport	2,226,824.40	2,150,178.45	76,645.95	Accruals
Training of Staff	46,000.00	46,000.00	-	
Uniforms	66,920.00	66,920.00	-	
Staff Welfare	83,706.20	83,706.20	-	
Other Goods & Services	-			
Office Expenses & Incidentals	131,594.34	84,166.00	47,428.34	Including Cleaning & Bank charges
Telephone, etc.	492,273.80	461,544.09	30,729.71	Accruals, pcalls
Maintenance & Running of Vehicles	542,690.41	560,077.00	- 17,386.59	Prepayment
Office Equipment & Furniture	223,060.40	223,060.40	-	
IT Equipment & Software	148,251.60	148,251.60	-	
Rent of Building	2,310,000.00	2,310,000.00	-	
Maintenance of Office Equipment	40,545.10	40,545.10	-	
Electricity & Water	948,727.57	953,197.47	- 4,469.90	Accruals
Documentation	76,471.27	76,512.74	- 41.47	Prepayment
Printing, Postages & Stationery	220,618.48	208,022.23	12,596.25	
Insurance	171,800.05	170,141.38	1,658.67	Prepayment
Security	16,668.00	16,668.00	-	
Linkages & Overseas Mission	252,738.26	168,084.10	84,654.16	Adj MASMA project
Advertising & Publicity fees	125,128.00	125,128.00	-	
Board & Committees	613,779.50	621,916.25	- 8,136.75	Adj PAYE
Legal & Professional	142,560.00	139,100.00	3,460.00	Adj MASMA project
Conference, Workshop & Seminars	123,285.13	123,285.13	-	
Hospitality	64,275.95	66,951.00	- 2,675.05	
NCG	33,639.55	21,008.12	12,631.43	Accruals
	34,111,819.07			

MAURITIUS OCEANOGRAPHY INSTITUTE

CASH FLOW STATEMENT

FOR THE YEAR ENDED 31 DECEMBER 2014

	Year ended 31 December 2014 Rs	Year ended 31 December 2013 Restated Rs
Cash flows from Operating activities		
Surplus/(Deficit)	41,132,342	13,373,274
Non-cash movements		
Depreciation	6,519,341	7,117,796
Impairment Loss		
(Decrease)/Increase in payables	(214,512)	23,716
Increase/(Decrease) in provisions relating to employee costs	4,072,134	(859,633)
(Increase)/Decrease in receivables	(214,344)	734,026
Research work	(14,512,175)	(18,885,183)
Interest Income	(415,611)	(538,198)
Net cash flow from operating activities	36,367,174	965,798
Cash flows from Investing activities		
Purchase of property plant and equipment	(4,649,971)	(7,002,323)
Intangible Asset	-	(245,784)
Interest Income	415,611	538,198
Payment for construction of MOI building	(42,048,006)	(5,836,920)
Net cash used in investing activities	(46,282,366)	(12,546,829)
Cash flows from financing activities		
Grant from Government of Mauritius for Capital Expenditure	12,492,945	9,821,766
Car Loan received from ministry	650,000	550,000
Car Loan paid to Staff	(650,000)	(550,000)
Car Loan reimbursed by staff	1,240,809	877,000
Car Loan refunded to Ministry	(1,240,809)	(877,000)
Net cash used in Financing Activities	12,492,945	9,821,766
Increase/Decrease in cash and cash equivalent	2,577,753	(1,759,265)
Cash and Cash Equivalents at beginning of period	16,615,141	18,374,406
Cash and Cash Equivalents at end of period	19,192,894	16,615,141

MAURITIUS OCEANOGRAPHY INSTITUTE

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2014

1 REPORTING ENTITY

At 31 December 2014, the Mauritius Oceanography Institute (MOI), was a parastatal body under the Prime Minister's Office, advises Government on the formulation and implementation of policies and in respect to oceanography. The Institute also undertakes and coordinates research and programmes development in that field.

The financial statements have been prepared in a spirit of adherence to the good governance of principles of accountability and transparency.
As from January 2015, the Mauritius Oceanography Institute is now under the ageis of the new Ministry for Ocean Economy, Marine Resources, Fisheries, Shipping and Outer Islands.

2 Basis of preparation

The financial statements of MOI have been prepared in accordance with the International Public Sector Accounting Standards (IPSASs) issued by the International Public Sector Accounting Board (IPSASB) which is a Board of the International Federation of Accountants Committee (IFAC).

Where an IPSAS does not address a particular issue, the appropriate International Financial Reporting Standards (IFRSs) and International Accounting Standards (IASs) of the International

Accounting Standards Board (IASB) are applied.

The financial statements have been prepared on a going-concern basis and the accounting policies have been applied consistently throughout the period. They have been prepared on the historical cost basis, except for the revaluation of certain properties and financial instruments.

The preparation of financial statements in conformity with IPSAS and generally accepted accounting practices requires the use of estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period.

3 Adoption of IPSAS

There is no impact in the opening balances resulting from the adoption of IPSAS

4 Measurement Base

The accounting principles recognized as appropriate for the measurement and reporting of the financial performance, cash flows, and financial position on an accrual basis using historical cost are followed in the preparation of the financial statements.

5 Revenue Recognition

(a) Income

Income is measured at the fair value of the consideration received.

(b) Government Grant

The revenue necessary to finance the expenditure of MOI is derived from the Ministry of Finance under the Prime Minister's Office vote for the year ended 31 December 2014.

Government grant consist of Recurrent grant and capital grant stated in the statement of financial performance under Revenue income

(c) Employee Entitlements

Employee entitlements to salaries, pension costs, and other benefits are recognized when they are earned. Employees are allowed to accumulate sick leaves and vacation leave as at 31 December 2014.

Provision has been made for both sick leave and vacation leave

A provision is made for the estimated liability for passage benefits. The passage benefits for each staff are valued at year end and is included as long term payables.

(d) Retirement Benefit Obligation

Defined Benefit Plan

Provisions for retirement benefits for the entity are made in accordance with the Statutory Bodies Pension Act 1978 as amended and in accordance with the IPSAS 25 (Employee Benefits)

The MOI assets are managed by the State Insurance Company of Mauritius Ltd (SICOM Ltd). The cost of providing the benefit is determined in accordance with the actuarial valuation.

Define Contribution scheme

As per PRB 2013, a Defined contribution scheme has been recommended for which all staff employed in the year 2013 have to contribute 6% and the employer MOI 12% of gross salary. This sum is accounted separately from the defined benefit plan

6 Property, plant and equipment

Property, Plant and Equipment are stated at cost or valuation, net of accumulated depreciation
This estimated useful lives of plant and equipment are as follows:

Depreciation is the systematic allocation of funds representing the use of an asset over its useful life.

The depreciation charged for each item and for each period shall be recognised in the Statement of Financial Performance for the period.

Depreciation is provided on the straight line basis so as to write off the depreciable value of the assets over their expected useful economic lives.

The annual rates of depreciation used for the purpose are as follows:

	No. of years
Equipment (Scientific)	**5**
Furniture and fittings	**10**
Office Equipment	**6-7**
Computer Equipment	**4**
Motor Vehicle	**5**
Container	**10**

7 Provisions

A provision is recognised when there is a present obligation (legal or constructive) as a result of probable that a past event, and it is an outflow of resources embodying economic benefits will be required to settle the obligation. And a reliable estimate can be made of the amount of the obligation.
Provisions are reviewed at each balance sheet date and adjusted to reflect the current best estimate.

8 Comparative Figures

Current paid figures are for one year period ended 31 December 2014. The prior year figures are for the year period ended 31 December 2013. The statement of Financial Performance, Statement of Financial Position and Cash Flow statement are comparable.

IPSAS 23 is being applied and current figures for 31 December 2013 has been restated.

9 Reclassifications

Donation from AMESD project has been re-classified under Non-Current liabilities.
Payment on Account for the construction of Building has been classified under Current Assets

10 Cash & Cash equivalents

	2014 Rs	2013 Rs
Bank	19,185,894	16,608,141
Cash	7,000	7,000
	19,192,894	16,615,141

11 Trade and other receivables

	2014 Rs	2013 Rs
Prepayments	420,468	296,124
Debtor	90,000	-
	510,468	296,124

12 Payment on Account - Construction of MOI Building

3 Acres of land have been vested under the PMO for the construction of the MOI building at Albion.
The contract for construction was awarded to LAXMANBHAI & CO. (MAURITIUS) LTD in July 2014.
The period for construction is for 1 year. Payment is incurred as per claims received from the contractor.
Total sum spent for the year ended 31 December 2014 is Rs 42,048,007 of which Rs 36,080,155 was paid to main contractor LAXMANBHAI & CO. (MAURITIUS) LTD.

Since there is no derived benefit at 31.12.14, it is being accounted in Current Assets.

13 Property, Plant and Equipment

	Scientific Equipment	Furniture & Fittings	Office Equipment	Computer Equipment	Motor Vehicle	Container	TOTAL
Cost	**Rs**	**Rs**	**Rs**	**Rs**	**Rs**	**Rs**	**Rs**
Balance at 1 January 2014							
MOI ASSET	28,147,006	2,950,301	2,426,695	7,285,770	2,708,439	279,797	43,798,008
Donation from AMESD	7,824,573	75,163	17,700	3,335,674	1,010,100		12,263,210
Additions	2,223,181	99,458	38,847	2,288,485	-	-	4,649,971
Disposal/Scrap		(227,287)					(227,287)
As at 31 December 2014	38,194,760	2,897,635	2,483,242	12,909,929	3,718,539	279,797	60,483,902
Accumulated Dep'n At 1 January 2014							
MOI Assets	21,026,510	1,932,889	1,952,812	6,556,120	2,200,923	153,889	33,823,143
Donation from AMESD	2,420,251	26,870	5,310	3,335,574	202,020	-	5,990,025
Charge for the period	4,716,384	210,142	140,981	914,576	509,278	27,980	6,519,341
Disposal/Scrap		(227,287)					(227,287)
As at 31 December 2014	28,163,145	1,942,614	2,099,103	10,806,270	2,912,221	181,869	46,105,222
Carrying amount at 31 December 2014.							
MOI Assets	10,031,615	955,021	384,139	2,103,659	806,318	97,928	14,378,680
31 December 2013.	12,524,818	1,065,705	486,273	729,750	1,315,596	125,908	16,248,050

Depreciation amount has been restated for the year 31.12.13 to include depreciation figure for assets from AMESD.An amount of Rs 227,287 has been scrapped from Furniture, being assets fully depreciated already written off

14 Intangible Assets

Amount accounted under Intangible Assets comprised of cost of software purchased for research purpose and software for computers as well as software from AMESD project.

As per IPSAS 31, no amortization has been done as the finite useful life of the software cannot be determined.

15 Long and Short Term Receivables - staff car loan

(Car loans bear interest at the rate of 7.5%)	2014	2013
As per PRB 2013 interest is at 4.65%	Rs	Rs
Amount due at 31 December 2014	2,644,513	3,235,322
Amount falling due within 1 year	(812,714)	(877,000)
Amount falling due more than 1 year	1,831,799	2,358,322

16 Payables

	2014	2013
	Rs	Rs
Creditors	1,418	127,988
Accruals	220,480	308,422
	221,898	436,410

17 Employee Benefits

	2014		2013
	Rs		Rs
Short term			
Provision for sick leave	404,354		377,745
Passage Benefit	300,000		250,000
	704,354	76,609	627,745
Long term			
Provision for Passage Benefits	1,223,896		1,054,014
Provision for Sick leave	4,090,849		3,716,421
Retirement Benefits obligations	(2,163,427)		(1,243,366)
Provision for vacation leave	4,371,276		
	7,522,594	3,995,525	3,527,069

As per PRB 2013 report recommendation, the opening balance has been adjusted by the provision for the year 2013

18 Income

	2014 Rs	2013 Restated Rs
Recurrent Grant	34,500,000	32,600,000
Other income	405,403	215,626
Interest	415,611	538,198
Capital grant	49,779,814	19,000,000
Less:		
Recurrent Grant used to finance purchase NCA	(223,060)	(124,141)
	84,877,769	52,229,683

With the adoption of IPSAS 23, the income for year 2013 has been restated

19 Research work

	2014 **Rs**	**2013** **Rs**
CLCS	4,193,200	2,352,295
Other capital expenses	2,122,290	535,452
MASMA	224,690	-
AMESD	2,285,732	2,427,209
Ballast	696,525	2,884,609
Bioprospecting	1,145,618	4,169,971
Coral farming	335,200	1,219,386
Bathymetric survey	47,079	437,167
Pearl Culture	54,444	765,025
ASCLME	31,040	214,797
Geology	256,254	54,402
DNA Barcoding	871,766	505,959
Spirulina	2,045,772	2,495,724
Lagoon and Beach erosion	202,565	475,326
Tsunami modelling	-	347,861
	14,512,175	18,885,183

20 Salaries and allowances

	2014 **Rs**	**2013** **Rs**
Salaries	22,065,680	19,804,145
Other staff related cost	6,271,289	2,385,051
Travel/Subsistence	2,150,178	2,336,530
Board Meeting fees & others	621,916	459,079
Staff welfare	150,626	106,389
	31,259,689	25,091,194

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21 Office and Administrative

	2014 Rs	2013 Rs
Advertising	125,128	80,710
Documentation	76,513	75,726
Rent and rates	2,310,000	2,292,500
Security	16,668	25,773
Telephone	461,544	507,524
Postage	28,688	38,457
Stationery	158,634	177,738
Insurance	170,141	170,571
Other Office Expenses	84,166	55,007
Hospitality	66,951	52,328
Electricity and water	953,197	848,517
Printing	20,700	156,294
Repairs and maintenance	40,545	86,002
Cleaning expenses	37,903	34,005
Vehicle Running Cost	560,077	870,629
IT Software and expenses	148,252	82,813
NCG allowance	21,008	176,436
Bank charges	14,658	14,976
	5,294,773	5,746,006

22 Legal and Professional fees

	2014 Rs	2013 Rs
Legal	42,000	72,000
Audit fees	75,000	75,000
Other Professional fees	22,100	
	139,100	147,000

23 Training and Seminar

	2014 Rs	2013 Rs
Staff training	46,000	83,500
Mission Overseas	168,084	488,192
Conference/Seminar	123,285	182,720
	337,369	754,412

24 European Union Funded Project

The African Monitoring of the Environment for Sustainable Development (AMESD) program aims at extending the operational use of Earth observation technologies and data to environmental and climate monitoring applications in order to provide African countries with the necessary resources to manage their environment more effectively and to ensure long-term sustainable development in the region.

It has received funding from the European Union's European Development Fund and is being implemented by the African Union Commission, with international technical assistance and the support of five Regional Implementation Centres, EUMETSAT and the European Commission Joint Research Centre.

In the year 2013 assets were donated to the MOI at fair value.

In March 2014, a new contract was signed with the European Union and the African Union Commission for the continuation of the AMESD project but now called the Monitoring of the Environment and Security in Africa (MESA). In April 2014 an amount of Euros 397,818.00 was received.

The MESA accounts are being prepared separately as per EU regulations EDF 10 and will be audited by a private owned company.

25 Related Party transactions

No related party transactions to be disclosed

26 Surplus/Reserves

Due to a change in Accounting Standards, from IAS 20 to IPSAS 23, reserve has increased considerably for year end 31.12.14 as all amount received as capital grant is recognised in the income statement.
Whereas for year end 31.12.13, there was large deficit by applying IPSAS.

The surplus reserve has been used for the payment to contractors for the construction of the new building at Albion. The treatment has been diclcosed as payment on account under current assets in the statement of Financial position note 12.

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