

Annual Report 2019 - 2020



Kerala State Biodiversity Board



ANNUAL REPORT 2019 - 2020

Published by :

Kerala State Biodiversity Board

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Pictures - Kollam Asramam, Kerala Biodiversity Heritage Site

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PRELUDE

It is of great pleasure that during the reporting period (2019-20) various programmes and activities had been carried out in various sectors of the whole State. As a result of these activities, appreciable progress had been achieved in the sectors such as conservation, sustainable utilization and access and benefit sharing of the biological resources. The concise and detailed report of these activities is summarized in the report.

The Kerala State Biodiversity Board received the honor as the first State Biodiversity Board that had completed BMC formation in all the three tier system of LSGs and preparation of People's Biodiversity Registers (PBR) in the entire local bodies at grass root level. The official declaration and inauguration of the first Biodiversity Heritage Site was done by Hon'ble Chief Minister Shri. **Pinarayi Vijayan** on June 5th 2019 as part of world environment day celebrations. In addition to these, the declaration of 10 Local Biodiversity Heritage Sites (LBHS), implementation of Model BMC projects and numerous activities in various local bodies of Kerala have been successfully conducted.

It is a great honour for our works that the digitalization of the PBRs (e-PBR) through the software developed by KSBB with the support of NIC Kerala had been appreciated by National Biodiversity Authority (NBA) and they are under the process of modifying this software for their usage at national level. The projects submitted as part of Rebuild Kerala Initiative (RKI) has been approved and the process for implementation of these projects are under going. The projects for rejuvenation of biodiversity in flood and rain affected areas has been initiated. The preparation of red data book of rare and endangered species of plants is under final stages. The Detailed Project Report for the conservation of sacred groves in Kerala is under progress. In addition to these, agro biodiversity conservation, riverine biodiversity conservation, and works funded by UNDP, FAO, NMPB, NBA are ongoing. KSBB conducted training programmes about the importance of Biodiversity conservation, the Biodiversity Act and Rules and responsibilities to Munsiff Magistrate trainees, Police Officers and all the Range Forest Officers in Kerala. It is expected that the activities of biodiversity board can be more effectively implemented in the next level by these awareness programmes.

Expert Members of the Biodiversity committee from Nepal had visited Kerala State Biodiversity Board to understand the various activities and appreciated our achievements.

Officials from NBA and members of PBR Monitoring Committee visited Kerala State Biodiversity Board on 5th March 2020, evaluated the various activities of the Board and appreciated our achievements.

I would like to express my sincere thanks to all the officers of Environment and other line Department for their immense support.

Chairman
Kerala State Biodiversity Board

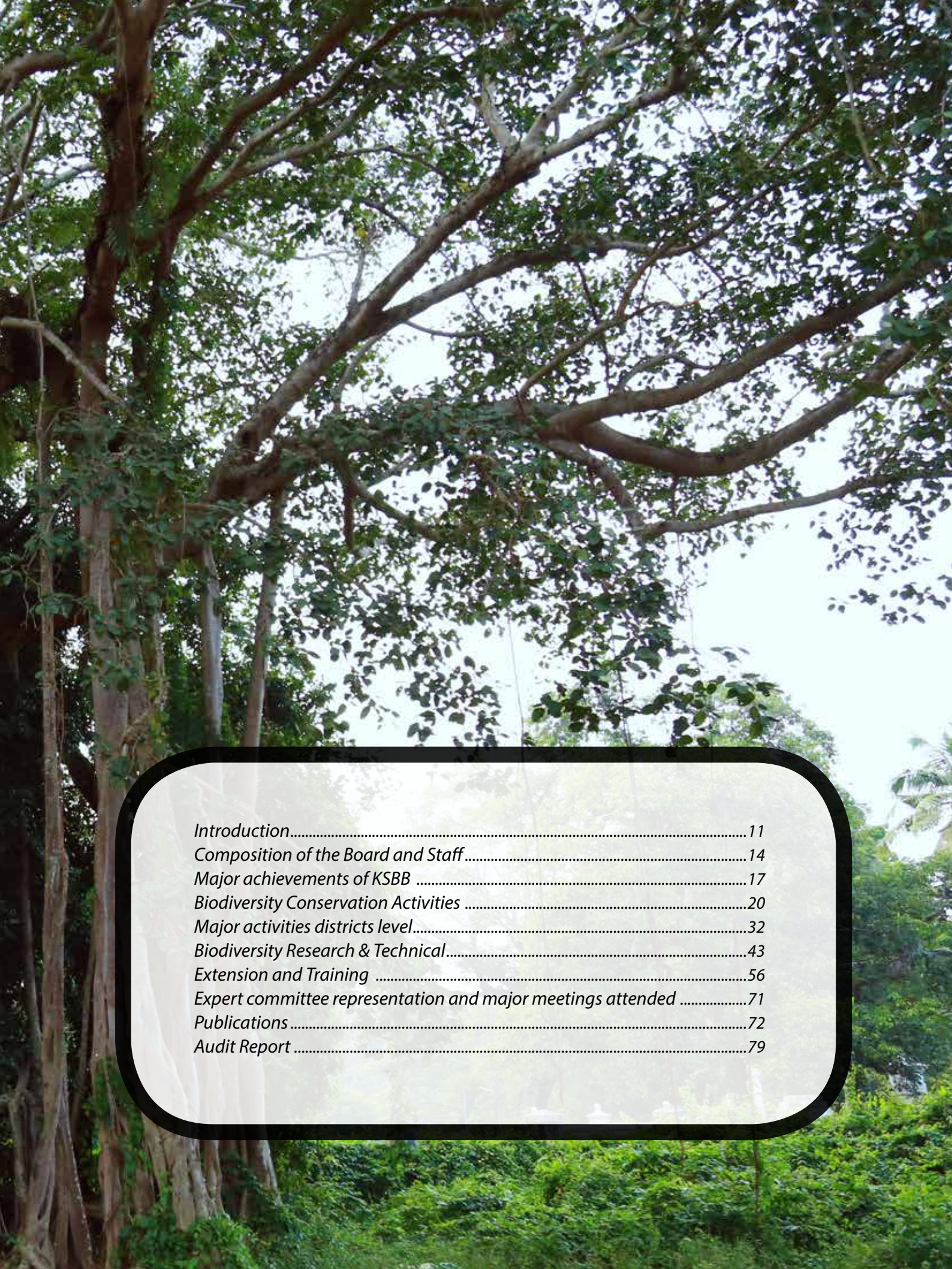
FOREWORD

Kerala State Biodiversity Board had completed numerous activities in 2019-2020 and initiated many new endeavors to start numerous district level and state level biodiversity activities in various sectors. The overall and integrated plans of these various activities are mainly focused on the conservation, sustainable utilization of biodiversity and equitable sharing of the benefits arising from them. The integration of various line departments in these activities is also initiated. These include, Local Self Government Department (LSGD), Forest Department, Haritha Kerala Mission, Agricultural Department, Research Centres, Universities, Mahatama Gandhi National Rural Employment Guarantee Scheme (MNREGS), etc. The various biodiversity activities of the KSBB is implemented with the mutual support of these line departments.

Numerous extension and training programmes had been conducted in 2019 -2020. I express my special thanks to the support provided by Board members, KSBB Chairman and Dr. Usha Titus IAS and all the officers of Environment Department for their immense support. Also I would like to thank all the line departments for their support and cooperation in the implementation of the various activities of the Board. Also I would like to express my thanks to the staff of the Board for successfully carrying out the various activities of the Board in the State.

Dr.V. Balakrishnan
Member Secretary
Kerala State Biodiversity Board





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1. Introduction

1.1 Background

Kerala State Biodiversity Board (KSBB) is an autonomous body of the State Government and comes under the Kerala State Environment Department. With the Head Quarters at Thiruvananthapuram the Board functions as per the provisions of the Biological Diversity Act 2002, Rules 2004 and Kerala State Biological Diversity Rules 2008. The KSBB is dedicated for conservation and sustainable utilisation of bio resources of the State and fair and equitable sharing of benefits. The Board is headed by a Chairman, Member Secretary and by a team of expert officials, leading the Board in all its vibrant activities.

1.2. The Biological Diversity Act, 2002

The Act was promulgated to meet the objectives of UN-Convention on Biological Diversity (CBD). The Act provides a legal framework for conservation of biological diversity of the country, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources. The Biological Diversity Act 2002 envisages a decentralized biodiversity management with Biodiversity Management Committees (BMCs) at local level, State Biodiversity Boards at State Level and National Biodiversity Authority (NBA) at National level.

In accordance with the provisions of Act of 2002 the State Biodiversity Board (KSBB) was established in 2005 and the Kerala Biological Diversity Rules was framed in 2008.

1.3. The National Biodiversity Authority (NBA)

The National Biodiversity Authority (NBA) was set up in the year 2003 with its headquarters in Chennai. The NBA is a statutory, autonomous body which provides advisory function for the Government of India.

1.4. Constitution of Kerala State Biodiversity Board (KSBB)

The Board was constituted in February 2005 vide GO (Ms) No. 1/2005/STED dated 01 June 2005 in accordance with the provisions under section 22-25 of the Biological Diversity Act 2002. Initially Board was housed under Kerala State Council for Science Technology and Environment (KSCSTE).

Later on in February 2006, when the new Environment Department was formed in Kerala [vide order GO (Ms) No. 10/2006/GAD dated 6.1.2006], the KSBB was transferred to the Environment Department [vide order GO (Ms) No.64/2006/GAD dated 16.2.2006]. In exercise of the power conferred by section 63 of the Biological Diversity Act, 2002 the Government of Kerala, formulated the Kerala Biological Diversity Rules 2008 vide GO(P) No. 1/2008/Envt. dated 10th June 2008, Rule 12 of the said Rules specifies the function of the State Biodiversity Board .

1.5 Functions of KSBB

The major function of the State Biodiversity Board is to advise the State Government on any guidelines issued by the Central Government on matters relating to the conservation of biodiversity. SBB also advocates for sustainable

use of biological resources and equitable sharing of the benefits arising out of the utilisation of these.

Board has the authority to grant approvals on requests for commercial utilisation or bio-survey and bio-utilisation of any biological resource by Indian citizens. The Board also perform functions necessary to carry out the provisions of Biological Diversity Act or as prescribed by the State Government.

The functions, objectives and strategies of the Kerala State Biodiversity Board reflect on the recitals to the Biological Diversity Act 2002 under which the Board is constituted, viz:

“WHEREAS India is rich in biological diversity and associated traditional and contemporary knowledge system relating thereto;

AND WHEREAS India is a party to the United Nations Convention on Biological Diversity signed at Rio de Jenerio on the fifth day June 1992; AND WHEREAS the said convention came into form on the 19th December 1993;

AND WHEREAS the said convention reaffirm the sovereign rights of the State over their biological resources;

AND WHEREAS the said convention has the main objective of conservation of biological diversity, sustainable use of its components, fair and equitable sharing of the benefits arising and of utilisation of genetic resources;

AND WHEREAS it is necessary to provide for conservation, sustainable utilisation and equitable sharing of benefits arising and of utilisation of genetic resources and also to give effect to the convention.

Also Rule 12 of the Kerala State Biodiversity Rules 2008 lays down 31 important functions to be performed by the State Biodiversity Board without prejudice to the generality of the provision of the Biological Diversity Act.

(i) Lay down the procedure and guidelines to govern the activities under section 23 of the (i)

Biological Diversity Act 2002;

(ii) Advise the State Government, subject to any guidelines issued by the Central Government, on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of the benefits arising out of the utilisation of biological resources;

(iii) Provide technical assistance and guidance to various departments of the Government;

(iv) Regulate by granting of approvals or otherwise requests for commercial utilisation or bio-survey and bio-utilisation of any biological resource by Indian nationals;

(v) Facilitate updation and implementation of State Biodiversity Strategy and Action Plan;

(vi) Commission studies and sponsor investigation and research;

(vii) Bio-conservation and preservation of unknown potential of every gene in every species of ecosystem;

(viii) Engage consultants for specific periods, not exceeding three years and with a monetary ceiling of Rs. 10 lakhs (Rupees Ten lakhs only) per consultancy, for providing technical assistance to the Board in the effective discharge of its functions, provided that if it is necessary and expedient to engage any consultant beyond three years the Board shall seek prior approval of Government for such engagement;

(ix) Collect, compile and publish technical and statistical data, manuals, codes and guides relating to conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resource and knowledge;

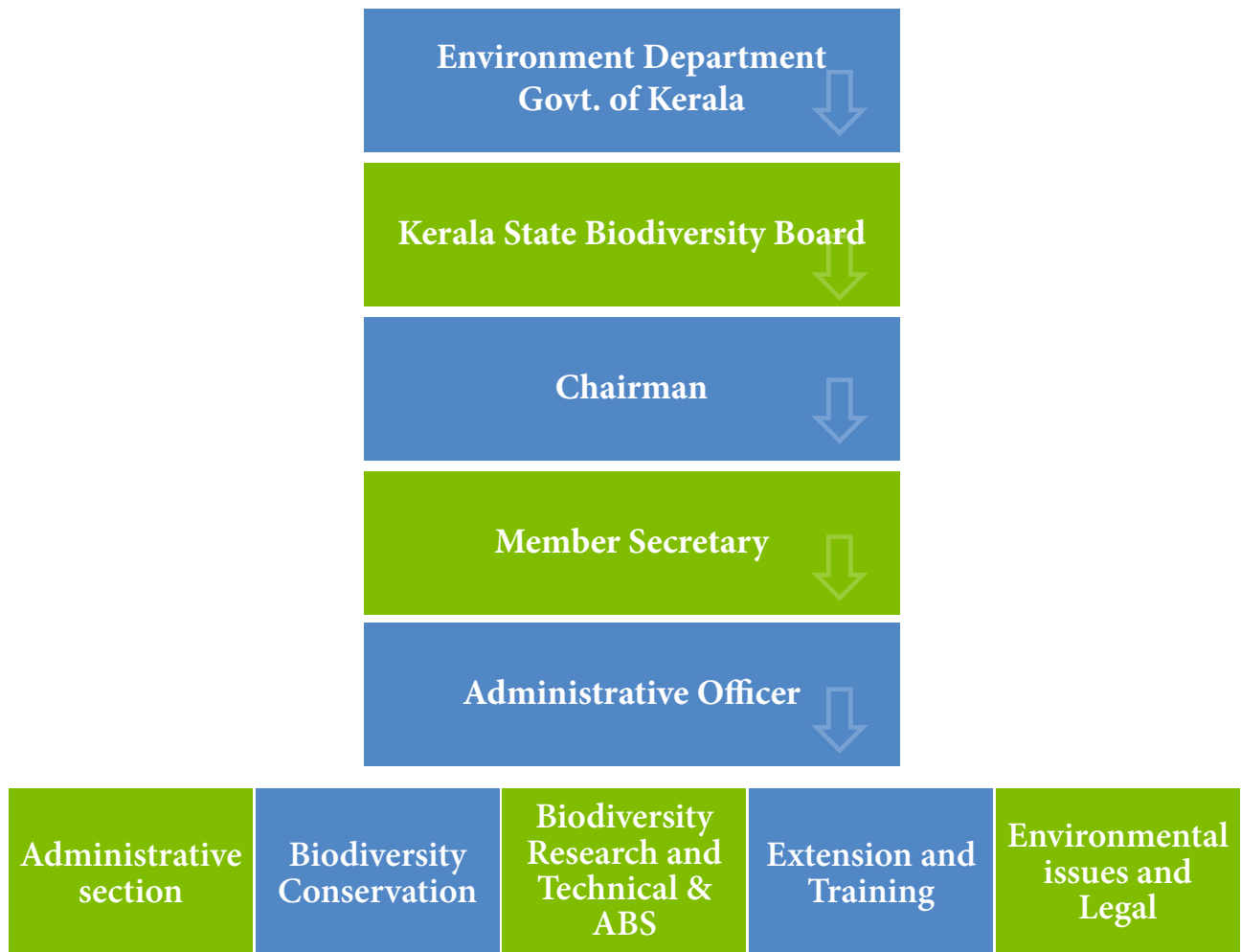
(x) Inventorisation, cataloguing of biodiversity, monitoring the rate of depletion, awareness creation in public, decision makers and planners and initiating scientific, administrative, legal and socio-economic measures for the protection of biodiversity;

- (xi) Compile a complete database on the biodiversity resources in the State;
- (xii) Development of state wide strategy for implementing biodiversity programmes
- (xiii) Identify the natural habitat of useful biological communities by enlisting the services of the locally available experts;
- (xiv) Preparation of an exhaustive inventory of the species available in the natural habitat of useful biological communities and take steps to preserve them;
- (xv) Take steps to build up database and to create information and documentation system for biological resources and associated traditional knowledge through biodiversity registers and electronic database, to ensure effective management, promotions and sustainable uses;
- (xvi) To devise methods to ensure protection of rights including intellectual property rights over biological resources and associated knowledge including systems of maintaining confidentiality of such information as appropriate, including the protection of the information recorded in People's Biodiversity Register;
- (xvii) Ensure that biodiversity and biodiversity-dependent livelihoods are integrated into all sectors of planning and management, and at all levels of planning from local to State, to enable such sectors and administrative levels to contribute effectively for conservation and sustainable use;
- (xviii) Plan and organize training programmes for personnel engaged or likely to be engaged for programmes in the conservation of biological biodiversity and sustainable use of its components;
- (xix) Organize through mass media a comprehensive programme regarding conservation of biodiversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resource and knowledge;
- (xx) Setting up sufficient infrastructure and strengthening technology base in biochemistry and biotechnology including molecular systematic;
- (xxi) Preparation of annual budget of the Board incorporating its own receipts as also devolution from the Central and State Government and National Biodiversity Authority;
- (xxii) Recommend creation of posts to the Government for the effective discharge of functions by the board and to create such posts;
- (xxiii) Approve the method of recruitment to such posts, which shall be done only with the prior approval of the Government of Kerala;
- (xxiv) Fix the terms and conditions of services of the employee (including salary and allowances, leave etc.) with prior approval of Government of Kerala;
- (xxv) Co-ordinate the activities of the Biodiversity Management Committees;
- (xxvi) Give directions to Biodiversity Management Committees for the effective implementation of the Act and to facilitate their meaningful participation in all measures relating to conservation, sustainable use and equitable benefit sharing;
- (xxvii) Report to the Government and the National Biodiversity Authority about the functioning of the Board and implementation of the Act;
- (xxviii) Recommend, prescribe or modify collection fee of biological resources from time to time;
- (xxix) Sanction grant-in-aid and grants to the Biodiversity Management Committee for the specific purpose;
- (xxx) Undertake physical inspection of any area within its jurisdiction in connection with the implementation of the Act;
- (xxxi) Do such other functions as may be directed by the Government from time to time.



2. Composition Of The Board And Staff

2.1 Organization structure



2.2. Details of Board members

The Board was reconstituted vide order No.GO (Ms) No.4/2018/Env. dated 27.07.2018.

SL.No	Name and Designation	Post
1.	Chairman Dr. S.C. Joshi IFS (Retd.)	Joined on 18.09.2017 - continuing
2.	The Executive Vice President, Kerala State Council for Science, Technology and Environment, SasthraBhavan, Pattom,Thiruvanahtapuram	Ex-official Members
3.	The Principal Secretary to Govt., Forest and Wildlife Department, Government Secretariat, Thiruvananthapuram	"
4.	The Principal Secretary to Govt., Fisheries Department, Government Secretariat, Thiruvananthapuram	"
5.	The Principal Secretary to Govt., Environment Department, Government Secretariat, Thiruvananthapuram	"
6.	The Agriculture Production Commissioner, Government Secretariat, Thiruvananthapuram	"
7.	Dr. K. Satheeshkumar Principal Scientist & Head (Retd.), Biotechnology, JNTBGRI, Palode	Non-official Members
8.	Sri. K.V. Govindan, Member, D.P.C. Kannur Madhavi Nilayam, Chuzhali P.O., Kannur-670142	"
9.	Dr. T.S. Swapna Associate Professor, Department of Botany,University of Kerala,Karyavattom Campus, Thiruvananthapuram	"
10.	Sri. A.K. Dharni IFS Principal Chief Conservator of Forest (Forest Management), Kerala Forest Department, Thiruvananthapuram	"
11.	Dr. K.T. Chandramohan Department of Botany, Govt. Brennan College, Thalassery, Kannur.	"

Member Secretary

Dr.V. Balakrishnan
Member Secretary From 01.11.2018 – continuing

2.3. Staff Strength of the Board

2.3.1. Permanent staff (On deputation)

SL No	Designation	Sanctioned strength	Working
Sanctioned staff on deputation			
1	Member Secretary	1	1
2	Administrative Officer	1	1
3	Finance Officer	1	1
4	Principal Scientific Officer	2	1
5	Scientific Officer	1	1
6	Technical Assistant	1	0
7	Assistant cum Cashier	1	1
8	Data Entry Operator	1	1
9	Confidential Assistant	1	1
10	Helper	1	0
11	Part time sweeper (permanent)	1	1

2.3.2. Temporary Staff

1	Technical Staff	9
2	Supporting staff	11
3	District Coordinators	14
4	Project fellows	35
5	Staff funded by NBA	4
6	Staff funded by UNDP-GEF	4
7	Consultant	1

2.4. Board meetings conducted during 2019-20

During the reporting period two board meetings were conducted as follows

- 50th Board meeting was held during 19.06.2019 at Govt. Guest House, Thycaud, Thiruvananthapuram
- 51st Board meeting was held during 13.01.2020 at the Chamber of Principal Secretary Environment, Govt. Secretariat, Thiruvananthapuram



3. MAJOR ACHIEVEMENTS OF KSBB

1. Biodiversity Conservation

1. BMC constituted at all levels of Panchayati Raj Institutions i.e, Panchayats, Municipalities and Corporations and at Block and District level.
2. Peoples Biodiversity Register preparation initiated during 2009, was completed in all Panchayats, Municipalities and Corporations of Kerala during the reporting period.
3. Asramom Mangroves, Kollam on the banks of Ashatamudi Lake, the First Biodiversity Heritage Site of Kerala was declared on June 5th 2019 by Hon'ble Chief Minister of Kerala, Sri. Pinarayi Vijayan. A five-year Management Plan for the same was prepared with budget and linkages with schemes of line departments and will be implemented by BMC along with Kollam corporation
4. 28 model BMCs were supported financially and technically for implementing locally specific biodiversity conservation projects with the support of concerned local bodies
5. Biodiversity conservation areas at different locations in Kerala focusing on different themes as conservation of sacred groves, mangroves, riparian vegetation, Rare, Endangered and Threatened plants, etc. is ongoing. During this period three projects Conservation of Sacred Grove at Kollam with Community Participation, Biodiversity Garden at Ezhome, Kannur and Riverine Biodiversity Rejuvenation, Maranallur, Thiruvananthapuram were taken up and is ongoing.
6. 4 local BHS and 6 Biodiversity heritage trees has been declared by the respective BMCs in different districts of Kerala
7. The software for PBR digitization developed by KSBB in association with NIC was adopted by National Biodiversity Authority for arriving at a National Framework for ePBR at national level and digitization of PBR is ongoing at LSG level.
8. KSBB district level officials are coordinating with the various activities of LSG/ BMC and other line departments and has undertaken extensive field visits for empowering BMCs to function as Environmental watch groups.

2. Biodiversity research and technical

1. Project on “Strengthening Agriculture and Allied Sector Contribution to India’s National Biodiversity Action Plan (NBAP) 2008 and National Biodiversity Targets (NBTS) 2014” under FAO’s Technical Cooperation Programme (TCP) was completed successfully and findings presented at National level workshop. The study identified researchable issues that may be taken up in future, which will essentially contribute to the mainstreaming of agrobiodiversity in the state and the major policy gaps. As part of the project training modules for BMC with specific

- focus on Agrobiodiversity was developed and implemented at local level at Alappuzha.
2. National Medicinal Plant Board (NMPB) project on “Resource Augmentation, Sustainable harvesting and value addition of Medicinal plants resources through Biodiversity Management Committee (BMC’s)” is currently being implemented at Thirunelli, Poothadi, Noolpuzha, Thavinjal and Pozhuthana Gramapanchayat of Wayanad district.
 3. Ministry of Environment, Forest and Climate Change, Government of Kerala and United Nations Development Programme with the support from the Global Environment Facility is implementing a project India High Range Mountain Landscape Project for developing an effective multiple use management framework for conserving biodiversity in the mountain landscape of the Western Ghats. KSBB is conducting two studies for analyzing the land use changes and impact on Biodiversity in the project area and documentation of flora, fauna and ecosystem diversity in 11 selected Grama Panchayats in the three Districts of Idukki, Ernakulum and Thrissur.
 4. Project on “Strengthening Local Self Governments to integrate Biodiversity Conservation in the local development plans” funded by NBA is being implemented by MSSRF. The major outcomes are
 - Capacity building of 10 BMC for developing local action plan
 - Four BMC selected in second phase for developing Local Strategies and action plan
 - Issue identified in 4 BMCs and action being taken by BMCs
 5. Three new project proposal for Riverine Biodiversity Rejuvenation through BMCs, Conservation of Agro biodiversity through BMCs, and study on database of traded bioresources of Kerala has been awarded to KSBB as part of Rebuild Kerala Initiative of Government of Kerala.
 6. Red data book of Kerala incorporating threatened species of Kerala both flora and fauna and their status is being prepared in collaboration with JNTBGRI, ZSI and CMFRI.
 7. Project on developing Propagation protocols on endangered plants listed under MoEF notification is ongoing. The major achievements during this period include:
 - *In situ* restoration of 2 species at Agasthyamala, Idukki WLS and Kuttiyamvayal reserve Forests, Wayanad.
 - Isolation and characterization of symbiotic fungus from *P. druryii* and utilization in restoration is under progress .
 - Survey and population study of *D. arayalpathra*, *A. pauciflora*, *G. inberti*, *H. bourdillonii* and *H. uniuga*, collection of seeds from different populations for their propagation is progressing
 8. Kerala State Biodiversity Board is an approved research centre under Kerala University. The Board is supporting 10 doctoral fellows who are conducting research on various aspects of biodiversity.
 9. During the reporting period KSBB submitted several reports to Government including Paristhithi Samithi. The major three studies conducted during this period included Impact of Interlinking of Rivers on Biodiversity submitted to Niyamasabha Paristhithi Samithi, Biodiversity study at Neyyambayam, Environment Poisoning from Pineapple farms in Kerala: A Preliminary Study as per orders of Hon’ble High Court of Kerala.
 10. Range officers of Kerala Forest Department were designated as Biodiversity nodal officer (vide GO No 19/2019 F & WLD dated 16.01.2019) for enforcing Biological Diversity Act and for strengthening BMCs to function as Environmental watch groups.
 11. The Police department vide Executive directive No 2/2020/PHQ dated 03/02/2020 has authorized that if any police officers have reasonable grounds to believe that an offence has been committed under the provisions of the Act they shall verify the facts by spot inspection and inform the concerned forest officers to take necessary action.

12. The Kerala State Government by G.O(Rt No.7/2020/Envnt dated18/01/2020 has issued an order for the establishment, administration, utilization and auditing of Kerala Biodiversity Fund. The fund is meant for conservation of biological diversity,fair and equitable sharing of the benefits arising out of the use of biological resources and as sociated knowledge
13. Kerala State Government by G.O 5/2020 /Envnt dated 03/03/2020 has empowered BMC to notify locally important biodiversity rich area/ ecosystems/ trees as Locally Important Biodiversity Heritage Areas after conductinga preliminary survey with the help of TSG.
14. Operational guidelines for processing of applications for Access to Biological resourcesreceived under Section 3 and Section 6 and as mandated by Section 41 of the Biological Diversity Act 2002 issued.
15. Operational guidelines for processing of applications for Access to Tribal knowledge issued.

4. Extension and training

1. The state of art Biodiversity Museumwhich was opened to public by KSBB,although in the initial stages of inception saw visitors from 290 schools and 10 colleges and has also attracted attention at national level.
2. As part of Communication, Education and Public Awareness programs commemorative days as World Environment Day 2019, Wildlife Week Celebration 2019 and National Bird Day 2020 were celebrated in a befitting manner.
3. A basic orientation training on various regulatory provisions under the Act and its field level implementation to Range Forest Officersof All territorial / Wildlife / Flying squad DFOs and RFOs under Southern CircleKollam, ABP Circle Thiruvananthapuram, and Northern Circle Kannur, Eastern CirclePalakkad and Wildlife Circle Palakkad was conducted in two batches. Training programswere conducted to Munsiff Magistrate trainees about the importance of Biodiversity conservation and the Biodiversity Act and Rules and to Police Officers on Biodiversity Act & Rules, Climate change & Biodiversity, Forest laws & Biodiversity Conservation and Threats to Medicinal plants
4. As part of IBD 2019 in all the 14 districts of Kerala an innovative one day camp “A DAY WITH LOCAL GENOME SAVIORS” a fun learning experience for youth andchildren to introduce them to the link between diverse food basket and health wasconducted. In each district a custodian farmer maintaining diversity of Agriculturalcrops under different thematic areas as Spice, Cereals, Fruit crops etc were selectedand about 25 students in the age group of 10-18 were invited to get hands onexperience of farming.
5. The extension wing of KSBB participated in exhibitions and various outreach events to spread awareness about biodiversity.
6. Biodiversity Awards 2018 consisting of Plaque, certificate and cash award. under 10 different categories were awarded to biodiversity conservers at grassroot level and organizations.
7. The 12th Children Biodiversity Congress (CBC) with the theme “Climate change and Agrobiodiversity” was conducted at State and district level and saw enthusiastic participation from young crusaders of biodiversity from all over the state.



4. Biodiversity Conservation Activities:

Major achievements:

- Completion of PBR in all the 1034 local bodies at grass root level viz., 941 Grama Panchayats, 87 Municipalities and 6 Corporations
- Formation of BMC's in all the three tier systems in Kerala
- Initiated the data entry of e-PBR in BMC's
- Identified and supported 28 Model BMC's in this year
- Implementation of three theme based biodiversity conservation areas
- Declaration of First biodiversity heritage site of Kerala – Kollam Asramam
- Declaration of 4 Local Biodiversity Heritage Sites and 6 Biodiversity Heritage Trees (Local BHS) in Kerala.

4.1. Preparation of People's Biodiversity Register (PBR)

The PBR is a comprehensive document on the biodiversity of the locality along with associated traditional knowledge prepared by BMCs with technical support of KSBB and Technical Support Groups (TSG). In pursuance of the Order of Hon'ble National Green Tribunal in the matter of O.A. 347/2016 dated 09.08.2019 for the completion of PBR preparation as per the provisions of the Biological Diversity Act 2002, KSBB took all efforts for expediting the process of PBR documentation in the remaining local bodies with the support of Local Self Government department. Thus during the reporting period of

2019-20, a total of 75 PBRs has been prepared and the process of PBR preparation in the entire 1034 local bodies at grass root level viz., 941 Grama Panchayats, 87 Municipalities and 6 Corporations has been completed. District wise details of total number of PBRs documented in each district are furnished in the Table 3A:

Details of PBRs periodical with state

Sl. No	District	Total no. of PBRs documented altogether
1	Trivandrum	73 GPs + 4M + 1C
2	Kollam	68 GPs+ 4M+ 1C
3	Pathanamthitta	53 GPs +4M
4	Alappuzha	72 GPs + 6M
5	Kottayam	71 GPs + 6M
6	Idukki	52 GPs + 2M
7	Ernakulam	82 GPs + 13M + 1C
8	Thrissur	86 GPs + 7M + 1C
9	Palakkad	88 GPs + 7M
10	Malappuram	94 GPs + 12M
11	Kozhikode	70 GPs + 7M+1C
12	Wayanad	23 GPs + 3M
13	Kannur	71 GPs + 9M + 1C
14	Kasaragod	38 GPs + 3M
	Total	941 GPs+ 87 M+ 6 C

(GP – GramaPanchayat, M – Municipality, C – Corporation)

In continuation with the Order passed by Hon'ble NGT, Principal Bench, New Delhi on 09.08.2019 in the matter of O.A. 347/2016 for the completion of PBR preparation, KSBB had taken following steps for the compliance of the Order :

- Two review meetings were held through video conferencing with the Secretaries of concerned local bodies in association with GramaPanchayat & Urban Directorates on 18.09.2019 and 15.10.2019 for reviewing the progress of PBR preparation.
- In accordance with the direction of Hon'ble NGT, the Chief Secretary of Kerala had convened a meeting on 28.10.2019 with Principal Secretaries of Environment and Local Self Government Departments (LSGD), Chairman and Member Secretary of KSBB, Senior officials of Panchayat and Urban Directorate and Rural Development Commissionerate. As per the direction of Chief Secretary, proper administrative support has been given to all the local bodies concerned through LSGD for the compliance of the Order

Similarly, in accordance with the Order of Hon'ble NGT, both Ministry of Environment, Forest and Climate Change (MoEFCC) and National Biodiversity Authority (NBA) together had held a series of meetings with all State Biodiversity Boards and UTs for reviewing the progress on compliance of the Order with regard to the completion of BMC constitution and PBR preparation since September 2019. The meetings held in this series are as follows:

- » First review meeting was held on 30.09.2019 at MoEFCC, New Delhi, which was attended by both the Chairman and Member Secretary of KSBB.
- » Second Review Meeting was held on 17.10.2019 at MoEFCC, New Delhi, which was attended by the Chairman of KSBB.
- » Third review meeting was held on 27-28th November 2019 at Chennai, the Member Secretary of KSBB attended.
- » Fourth review meeting was held on 19.12.2019 through Video Conferencing (VC) hosted and coordinated by National Informatics Centre (NIC). The Member Secretary and concerned officials of KSBB attended.

- » Fifth review meeting was held on 22.01.2020 through Video Conference in coordination with NIC at Chennai, the Member Secretary and concerned officials of KSBB attended the meeting.

4.2. Constitution of Biodiversity Management Committees (BMCs) in Block and District Panchayats of Kerala:

In pursuance of the Order of Hon'ble NGT, Principal Bench, New Delhi, NBA directed to constitute BMCs in all local bodies of the State including the three tiers of Panchayati Raj system. Accordingly KSBB initiated constitution of BMCs in the remaining upper two tiers of Panchayati Raj systems in the State viz., Block Panchayats and District Panchayats. Principal Secretary of LSGD also gave special direction to all the 152 Block Panchayats and 14 District Panchayats for constituting BMCs in their jurisdiction by the end of December 2019. For expediting the process of BMC constitution in Block and District Panchayats and also for providing necessary guidelines in this regard, KSBB held video conferencing with all the 152 Block Panchayat Secretaries on 09-12-2019 in association with Rural Development Commissionerate. Similarly KSBB directly held Video Conference with all the 14 District Panchayat Secretaries on 18.12.2019. Thus, by constituting BMCs in the Block and District Panchayats, BMC constitution has been completed in all the 1200 local bodies of Kerala viz., 941 Grama Panchayats, 152 Block Panchayats, 14 District Panchayats, 87 Municipalities and 6 Corporations.

4.3. Strengthening of BMCs :

1. Model BMC programme:

Biodiversity Management Committees (BMC) has been constituted in all the local bodies of Kerala as per Section 41 of Biological Diversity Act 2002 and Rule 20 of Kerala Biological Diversity Rules 2008. The BMCs are mandated with conservation of biodiversity in their respective jurisdiction and documenting of biodiversity and associated knowledge in People's Biodiversity Register. In

Kerala, BMC has been empowered to function as Environmental Watch Group vide Govt of Kerala Order No 04/13/ Env't dated 13.05.2013. By the said order it was directed that the grass root level community environmental protection will be the primary responsibility of the BMC of respective Panchayat. The respective BMC will be responsible to inform the concerned authorities for taking immediate action against all activities violating environmental rules, acts, notifications, as also environmental depletion, general public health problems and circumstances which leads to/ or may lead to threat of human life.

During the 13th five year plan it was aimed to strengthen the BMC's through capacity development and policy support to sustainably

manage the natural resources at local level. As part of this KSBB had started a project to develop as many BMC's as models which can be replicated during the subsequent years. During 2017-18 twenty BMC's were selected and during the reporting period, 28 model BMC's were selected (two from each district) and they are being empowered and provided financial support for focused projects. KSBB allotted Rupees Five lakh to each of selected 28 BMC's for implementing locally specific biodiversity conservation projects with the support of concerned local bodies, and as first installment Rs. 3 lakh has been provided to each BMC's. The list of various projects which are being implemented in each of the selected 28 BMC's are furnished in the Table 3B:

BMC/ Local body & District selected for various project 2019 - 2020

Sl. No.	Name of BMC/ Local body & District	Project details
1	Kalliyoor Grama Panchayat, Thiruvananthapuram	<ul style="list-style-type: none"> • Bio fencing around the Vellayani Lake • Planting of Bamboo, <i>Pandanus</i>, etc. along the bank of Kannukulichal • Planting of traditional fruit plants along the bank of Vellayani Lake • Restoration of heronry (for local and migratory birds) at Kireedampalam
2	Kattakkada Grama Panchayat, Thiruvananthapuram	<ul style="list-style-type: none"> • Bio fencing of Kulathummal canal (22 km stretch) • Medicinal Plant's Garden (Oottukuzhi Ayurveda Hospital) • Establishment of a public centre for developing planting materials for traditional tubers
3	Thekkumbhagom Grama Panchayat, Kollam	Mangrove planting along the banks of Ashtamudi Lake
4	Munroe thuruthu Grama Panchayat, Kollam	Conservation of Mangroves
5	Ayiroor Grama Panchayat, Pathanamthitta	<ul style="list-style-type: none"> • Planting of Aattuvanchi (<i>Homonoia riparia</i>) along the banks of Pampa River • Conservation of Sacred groves • Establishment of Medicinal Plant Garden

6	Kozhenchery Grama Panchayat, Pathanamthitta	<ul style="list-style-type: none"> • Conservation of Ponds and Canals (Kolathra pond and Potholi canal) • Conservation of various Sacred groves • Conservation of 400 year old Karimbana (<i>Borassus flabellifer</i>) tree
7	Karuvatta Grama Panchayat, Alappuzha	<ul style="list-style-type: none"> • Development of Propagation Centre for the conservation and promotion of traditional and climate resilient varieties of fruits, tubers, leafy vegetables, vegetables, spices and medicinal plants
8	Veeyapuram Grama Panchayat, Alappuzha	<ul style="list-style-type: none"> • Conservation of Sacred groves, ponds and medicinal plants • 'Thenurum Thenvarikka' programme (Jack fruit tree conservation programme)
9	Ayarkunnam Grama Panchayat, Kottayam	<ul style="list-style-type: none"> • Conservation of Aattuvanchi (<i>Homonoia riparia</i>) along the banks of Meenachil River
10	Njeezhur Grama Panchayat, Kottayam	<ul style="list-style-type: none"> • Conservation of traditional varieties of Jack fruit and mangoes and conservation of medicinal plants
11	Thodupuzha Municipality, Idukki	<ul style="list-style-type: none"> • Planting of fruit trees and shady plants in public places • Conservation of traditional varieties of crops and breeds • Conservation of sacred groves, ponds and marshes • Promotion of organic farming • Conservation of abandoned quarries
12	Mariyapuram Grama Panchayat, Idukki	<ul style="list-style-type: none"> • Harithapuram park –Eco restoration and conservation of Periyar River bank severely damaged due to flood
13	Kadamakkudy Grama Panchayat, Ernakulam	<ul style="list-style-type: none"> • Conservation of traditional varieties of Pokkali rice
14	Njarakkal Grama Panchayat, Ernakulam	<ul style="list-style-type: none"> • Conservation of traditional varieties of Pokkali rice
15	Kodakara Grama Panchayat, Thrissur	<ul style="list-style-type: none"> • Conservation of Sacred Groves in the Panchayat

16	Edathiruthi Grama Panchayat, Thrissur	<ul style="list-style-type: none"> Eco restoration of Canolly Canal along 15 Km stretch
17	Nemmara Grama Panchayat, Palakkad	<ul style="list-style-type: none"> Conservation and Promoting cultivation of indigenous rice varieties of Palakkadan Matta
18	Vellinezhi Grama Panchayat, Palakkad	<ul style="list-style-type: none"> Conservation of sacred groves Nakshatravanam, butterfly park Nattupoonthottam, Medicinal garden Augmentation of sacred groves, Conservation of River Conservation of heronries Planting of Karimbana, date palms Conservation of traditional knowledge Conservation of local variety of cow, hen (Arupathamkozhi)
19	Ponnani Municipality, Malappuram	<ul style="list-style-type: none"> Biodiversity park near Naithalloor Pookkayilpadam
20	Oorngattiri Grama Panchayat, Malappuram	<ul style="list-style-type: none"> Biodiversity park at Odakkayam Govt. UP School
21	Perumanna Grama Panchayat, Kozhikode	<ul style="list-style-type: none"> Biodiversity park at Govt. E.M.S.H.S.S. School (in 50 cent barren land)
22	Kottur Grama Panchayat, Kozhikode	<ul style="list-style-type: none"> Conservation of river bank Establishment of Biodiversity park Biodiversity gardens (50 units)
23	Mananthavadi Municipality, Wayanad	<ul style="list-style-type: none"> Biodiversity conservation and Eco restoration after flood Enriching riparian vegetation Planting bamboos in landslide affected areas
24	Panamaram Grama Panchayat, Wayanad	<ul style="list-style-type: none"> Conservation of Panamaram Heronry
25	Kurumathur Grama Panchayat, Kannur	<ul style="list-style-type: none"> Aranyakam – Afforestation and conservation Afforestation along river bank Propagation and planting of traditional fruit plants Medicinal plant garden in schools Planting Pandanus along canal banks Afforestation of mangroves along river bank Carbon Neutral Panchayat

26	Kuthuparambu Municipality, Kannur	<ul style="list-style-type: none"> • Conservation of trees and climbers • Butterfly garden • Planting medicinal plants • Bio fencing • Protection of honeybees
27	Kinanoor-Karinthalam Grama Panchayat, Kasaragod	<ul style="list-style-type: none"> • Conservation of fruit trees and crops • Establishment of a model farm for traditional breeds of cattle • Conservation of Pallam, natural aquifers • Augmentation and conservation of sacred groves
28	Neeleswaram Municipality, Kasaragod	<ul style="list-style-type: none"> • Conservation of Pallam, natural aquifers • Planting local fruit trees along road side • Afforestation of Bamboo and mangroves along river bank • Establishment of biodiversity park at Kacherikadavu

4.4. Theme based biodiversity conservation areas:

The proposed project envisages setting up of biodiversity conservation areas at different locations in Kerala focusing on different themes as conservation of sacred groves, mangroves, riparian vegetation, Rare, Endangered and Threatened plants, etc. Under this scheme three projects are implemented with the support of concerned BMCs.

- a. **Conservation of Sacred Grove at Kollam with Community Participation:**-Sacred Groves are very distinct ecosystems in Kerala and unique in biological diversity. The vegetation in the undisturbed groves is luxuriant and with multi layered trees mixed with shrubs, lianas and herbs. Sacred groves act as an abode for many rare, endemic, endangered species and economically important plants of fruit bearing and medicinal properties, birds, reptiles especially snakes and a number of rare and endemic fauna. Eco restoration and conservation of sacred groves will be taken up under this component in a participatory manner through joining hands with the local bodies/BMC and other community stakeholders.

Poredom Sree Mahadeva temple sacred grove located at Ward No.1 of Chadayamangalam Grama Panchayat in Chadayamangalam Legislative Constituency was chosen for the project. The Sacred grove is situated in 3 acres and has a pond of about 60 cents of area. The study revealed the presence of more than 100 species of flora including six species which are rare and critically endangered. The Sacred grove is facing severe anthropogenic pressure resulting in the damage of the pristine ecosystem. The project is awarded to Jawaharlal Nehru Tropical Botanical Garden and Research Institute (JNTBGRI), Thiruvananthapuram. As first installment Rs. 4 lakh has been provided to the agency. The key objectives of the project include:

- » Develop a participatory model for sustainable management of sacred groves in the State
- » Eco-restoration of the Sacred grove and pond into a rich local biodiversity repository with the participation of BMC/ Local Self Government and Stakeholders
- » Restoration of Sacred grove and Pond for the sustainability of entire ecosystem.

b. Biodiversity Garden at Ezhome, Kannur:-The project will be supporting development of a Biodiversity Educational Centre in a 2.5 acres land of the Govt. Higher Secondary School, Kottila of Ezhome Grama Panchayat. This component will include.

- Bio fencing and development of a medicinal plant garden and butterfly park at GHSS, Kottila thereby developing the park as an educational hub for neighbouring institutions.
- All species would be labelled properly
- Development of a nursery and an eco-friendly Interpretation Centre
- Development of a Walkway for the visitors

The project would be implemented by BMC of Ezhome panchayat and Biodiversity club members of GHSS, Kottila with the support of an implementation cum Monitoring Committee comprising of President-Ezhome Grama panchayat, Principal, GHSS, Kottila, District Co-ordinator of KSBB. A total amount of Rs. 9 lakh has been sanctioned and as first installment, Rs. 3 lakh has been provided to the BMC.

c. Riverine Biodiversity Rejuvenation, Maranallur, Thiruvananthapuram:- The project will be implemented through the BMC of the Maranallur Grama Panchayat and consists of two components viz., Conservation of Neyyar Riverine Ecosystem and Establishment of a Biodiversity Garden near the premises of abandoned quarry ponds at Kukkirippara hill region. KSBB sanctioned a total budget of Rs. 6 lakh for the project and an amount of Rs. 3 lakh has been provided to the BMC as first installment. The key objectives under two components of the project include:

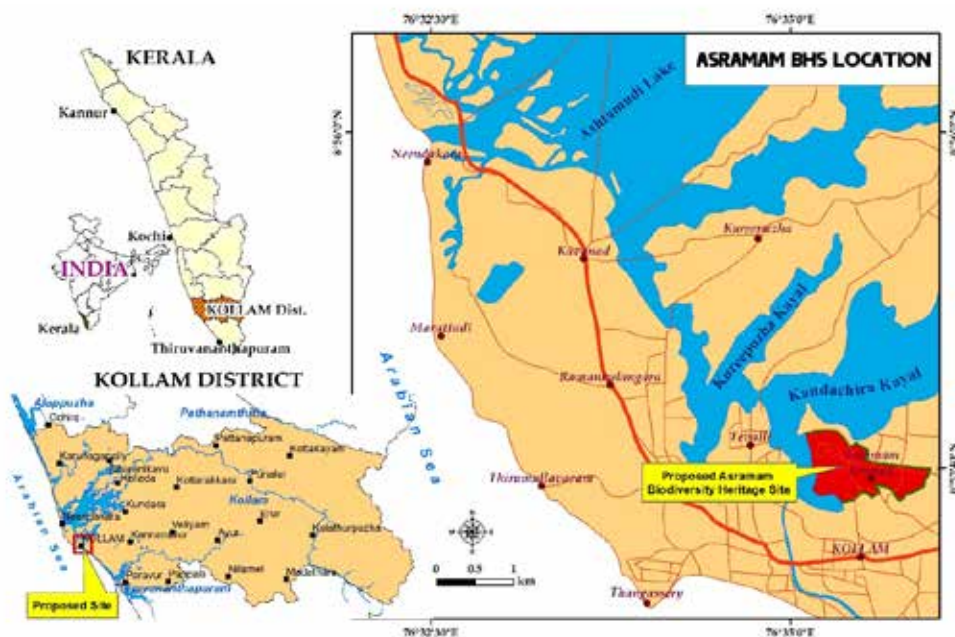
1. Conservation of Neyyar Riverine Ecosystem

- Biodiversity conservation and rejuvenation of Riverine ecosystem
- Reducing river pollution
- Promoting usage of bamboo and reeds from the Riverine ecosystem for traditional livelihoods

2. Establishment of Biodiversity Garden

- Biodiversity conservation and rejuvenation of endemic fruit trees
- Creation of environmental awareness
- Reducing pollution and increasing recreational and aesthetic value

4.5. First Biodiversity Heritage Site of Kerala – Kollam Asramam:



Government of Kerala has issued notification, G.O. (P) No. 1/2019/Envnt on 3rd June 2019, declaring the biodiversity rich areas of Asramam region except Asramam Maidanam falling under the jurisdiction of Kollam East Village and Kollam Corporation as Asramam Biodiversity Heritage Site. This was announced by Hon'ble Chief Minister Shri. Pinarayi Vijayan on June 5th 2019, World Environment Day.

The Asramam BHS is coming under the jurisdiction of Kollam east Village and the area demarcated falls within the survey Block No. 67, 160, 161 and 162 (Ashtamudi Lake). This Area falls within the geographical coordinates 76° 34'46"-76° 35'50" E Longitude and 8° 53' 27"-8°53'58"N Latitude. With the help of Field Measurement Book (FMB) details of Block No. 160, 161 and 162 GPS (Global Positioning System) delineation of the BHS and the details are as follows.

Survey details of Asramam BHS

Sl. No	Block No.	Survey No.	Area (Hectars)	Description
1	160	1	13.81 Ha.	Port Department, Govt. of India
		2		Govt. of Kerala
		3		Police Department, Govt. of Kerala
		4		Irrigation Department. Govt. of Kerala
		5		Govt. of Kerala
		6		Road, Govt. of Kerala
		7		State Government land (Unclaimed)- YathriNivas
		8		Central Government (Unclaimed) – Port Department
		9		State Government land (Unclaimed land)- Part abandoned and part for Harbour Development Authority
2	161	1	16.92 Ha.	State Government land (Unclaimed)- Guest House Quarters
		2		1.Government land (Unclaimed)–Adventure park. 2.Guest House 3.Guest House Annex 4.Children's Park 5.Coffee Shop
3	162	1	28.25	AsramamKayal
Total area			57.53 Ha. (142.16 Acres)	

Details of meetings conducted for management plan:

Stakeholder consultations were held on 22.07.2017, 29.10.2019, 23.11.2019, 07.12.2019

Management plan was prepared with budget and linkages with schemes of line departments after detailed consultation.

4.6. Local Biodiversity Heritage Sites (Local BHS):

This is a new initiative undertaken by KSBB for promoting conservation and management of locally specific biodiversity rich areas/ ecosystems/trees by BMCs. BMC's has been empowered to declare such area as local BHS by passing a resolution as per the provisions of the BD Act, Section 41, with the prior consent of the Board, after conducting thorough study regarding the biological importance of the proposed site/ tree with the support of district level Technical Support Group. So far, 9 such sites/ trees were declared by BMC's as local BHS/biodiversity heritage trees and the resolution of the same has been submitted to KSBB. 'Pannivelichira', a wetland ecosystem in Mallappuzhasseri Grama Panchayat in Pathanamthitta district is the first Local BHS and a two hundred year old cashew nut tree in the area of Pandalam Thekkekara Panchayat in Pathanamthitta district is the first Local Biodiversity Heritage Tree declared in the State.

The State level Steering Committee on biodiversity had recommended declaration of Biodiversity rich areas as local BHS by BMC's through a resolution for the purpose of conservation without causing restrictions on legitimate use by the stakeholders and local community. Accordingly, the Government had given permission to BMC's for declaring locally specific biodiversity rich areas or trees as local biodiversity heritage sites/ trees vide G.O.(MS) No.05/2020/Env. dated 03.03.2020.

Local Biodiversity Heritage Sites (Local BHS)

Sl. No.	Name of BMC & District	Name of Local BHS/ Tree	Date of Resolution passing
1	Mallappuzhasseri Grama Panchayat, Pathanamthitta	'Pannivelichira' – a wetland ecosystem	26.10.2019
2	Pandalam Thekkekara Grama Panchayat, Pathanamthitta	A two hundred year old cashew nut tree in the 5 th ward of panchayat	16.10.2019
3	Pandalam Municipality, Pathanamthitta	16 number of trees (heronries) seen in the town area of the municipality	12.11.2019
4	Anchuthengu Grama Panchayat, Thiruvananthapuram	Two Chempaka trees seen in 2nd ward of panchayat (about 250 year old)	05.12.2019
5	Chirayinkeezhu Grama Panchayat, Thiruvananthapuram	'Nattumavu' (150 year old) seen in 5 th ward of panchayat	07.12.2019
6	Mudakkal Grama Panchayat, Thiruvananthapuram	'Kadalkandam' – a biodiversity rich wetland area & a two hundred year old tree – 'Poovanam' as local biodiversity heritage tree.	11.12.2019
7	Ayarkunnam Grama Panchayat, Kottayam	A two hundred year old 'Nattumavu' tree, a keystone species seen along the bank of Meenachil River	12.12.2019
8	Alakkode Grama Panchayat, Kannur	'Eeyyabharanithuruthu' – a biodiversity rich island area in the Kuppampuzha	27.12.2019
9	Pallikkal Grama Panchayat, Pathanamthitta	'Arattuchira' - a wetland ecosystem	03.01.2020

4.8. Review meetings

1. **Video conference with District Coordinators and Project Fellows:** - As part of regular monitoring of progress of various activities at district level, video conferences were held with District Co-ordinators and Project Fellows at least once in every month. During the reporting period 9 such video conferences were conducted on 02.04.2019, 04.05.2019, 12.06.2019, 18.07.2019, 18.09.2019, 05.10.2019, 07.11.2019, 18.12.2019 and 23.01.2020. On 4th February 2020, a review meeting for District Coordinators has been held at KSBB head quarter, Thiruvananthapuram.



2. **Video Conference with Technical Support Group (TSG):**- Two review meetings were held during the reporting period with TSG members and District level Resource persons on 07.11.2019 and 18.12.2019.



3. **Video Conference with Model BMCs:**- As part of reviewing the progress of various projects undertaken by selected BMCs under the Model BMC plan scheme of KSBB for the period of 2016-17, 2017-18 and 2019-20, two video conferences were held with concerned BMCs on 23.10.2019 & 23.01.2020.



4.9. Appraisal visit of National level PBR Monitoring Committee:-

The Principal Bench of the Hon'ble National Green Tribunal vide Order dated 9th August 2019 in O.A. No. 347 of 2016 had issued instructions to constitute a monitoring committee to oversee the quality of PBRs on sample basis by evolving a suitable mechanism. Accordingly vide Office Memorandum No. NBA/15/30/2019/SBB/NGT dated 20.01.2020, the National Biodiversity Authority (NBA) has constituted National level PBR Monitoring Committee. As part of developing methodology of monitoring the PBRs, the NBA in coordination with KSBB had organized the second level meeting of the PBR Monitoring Committee at Thiruvananthapuram during 5th and 6th March 2020 at Hotel Mascot, Thiruvananthapuram. A team of 16 members including NBA Chairman and Secretary participated in the two days programme. As part of the appraisal visit of the Committee, KSBB had issued a compendium on various procedures adopted by the Board for the constitution of BMCs and preparation of PBRs ever since its inception. During the first day of visit i.e. on 5th March, the team visited KSBB headquarters and inception with staff members and visited two BMCs in the district and had interactions with members of council of local body, BMC members and officials regarding BMC activities and PBR preparation. The committee visited Thiruvananthapuram Corporation- an urban BMC and also visited Maranallur Grama Panchayat a rural BMC.



4.10. NBA visit to Biodiversity Museum

A team comprising 17 members from NBA had visited Kerala Biodiversity museum on 5th March 2020. The team was lead by the chairperson, NBA, Chennai.



Appraisal visit of National level PBR Monitoring Committee

4.11. Visit of Nepal Delegates to KSBB Head quarters:

A team from the Nepal Biodiversity Board visited KSBB and interacted with the team, gathered relevant informations. They also visited Mr Appukuttan Kani vaidyar and discussed about the traditional treatment modalities which was appreciated by the team.



Visit of Nepal delegates to KSBB headquarters

4.12. PBR Digitisation (e-PBR Preparation)

As the preliminary step of e-PBR preparation of the state, technical training had been given to District Coordinators, Project fellows of KSBB and Technical Assistants of 1034 local bodies on BIOMIS software. The user names and passwords have been provided to each local body. A training tutorial video was created and distributed to respective members/ local body for more clarification. Out of 1034 local bodies of the state a total of 411 local bodies had started the entry of PBR data in BIOMIS software during the reporting period

e-PBR data entry status of each district		
Name of the district	Total Number of BMCs	BMCs started entry
Thiruvananthapuram	78	13
Kollam	73	16
Pathanamthitta	57	57
Alappuzha	78	16
Kottayam	77	16
Idukki	54	50
Ernakulam	96	48
Thrissur	94	10
Palakkad	95	41
Malappuram	106	31
Kozhikode	78	47
Wayanad	26	6
Kannur	81	33
Kasaragod	41	27

As part of developing a national framework for PBR and for rescoping of e-PBR pilot project a meeting was held on 6th and 7th February 2020 at the State unit of NIC, Thiruvananthapuram. During the meeting the necessity of aligning the e-PBR pilot project in time with the proposed National framework was flagged.



5. Major activities at districts level :

5.1 Details of BMC meetings conducted in different districts of Kerala

BMC meetings held in Thiruvananthapuram district

Sl. No	Name of BMC	Date of meeting
1	Kalliyoor	19-09-2019
2	Kattakkada	24-09-2019
3	Varkkala	26-09-2019
4	Kuttichal	30-09-2019
5	Maranalloor	01-10-2019
6	Perumkadavila	03-10-2019
7	Kalliyoor	10-10-2019
8	Maranalloor	16-10-2019
9	Athiyanoor	16-10-2019
10	Kuttichal	18-10-2019
11	Vithura	19-10-2019
12	Kattakkada	22-10-2019
13	Vellarada	25-10-2019
14	Karakulam	26-10-2019
15	Kollayil	01-11-2019
16	Pulimathu	28-11-2019
17	Balaramapuram	30-11-2019
18	Anchuthengu	05-12-2019
19	Kizhuvilam	05-12-2019
20	Maranalloor	06-12-2019
21	Kadakkaavoor	07-12-2019
22	Chirayinkeezhu	07-12-2019
23	Anchuthengu	10-12-2019
24	Chirayinkeezhu	10-12-2019
25	Vamanapuram	10-12-2019
26	Mudakkal	11-12-2019
27	Vakkom	13-12-2019
28	Vilappil	18-12-2019
29	Varkkala	19-12-2019
30	Trivandrum corporation	20-12-2019
31	Maranalloor	24-02-2020
32	Vellanadu Block	24-02-2020
33	Trivandrum corporation	25-02-2020
34	Anadu	26-02-2020
35	Varkala	27-02-2020
36	Trivandrum corporation	05-03-2020
37	Kattakada	17-03-2020
38	Karavaram	23-03-2020
39	Kattakkada	04-11-2019
40	Edava	11-11-2019
41	Chirayinkeezhu	11-11-2019
42	Perumkadavila	12-11-2019
43	Karakulam	14-11-2019
44	Kallikkadu	16-11-2019
45	Varkkala	18-11-2019
46	Kattakkada	21-11-2019
47	Vellarada	22-11-2019
48	Athiyanoor	23-11-2019
49	Kutichal	25-11-2019
50	Mudakkal	26-11-2019
51	Kallikkadu	26-11-2019
52	Manikkal	26-11-2019
53	Pazhayakunnummel	28-11-2019
54	Kattakkada	23-12-2019
55	Pangode	04-01-2020
56	Kuttichal	10-01-2020

57	Kalliyoor	14-01-2020
58	Maranalloor	18-01-2020
59	Ottasekharamangalam	24-01-2020
60	Pothencode	27-01-2020
61	Aruvikkara	28-01-2020
62	Karavaram	30-01-2020
63	Poovachal	05-02-2020
64	Pangode	10-02-2020
65	Maranalloor	12-02-2020
66	Trivandrum corporation	18-02-2020

67	Kattakkada	22-02-2020
68	Parassala Block	22-02-2020
69	Anadu	28-02-2020
70	Maranalloor	28-02-2020
71	Trivandrum corporation	01-03-2020
72	Poovar	02-03-2020
73	Maranalloor	03-03-2020
74	Maranalloor	05-03-2020
75	Kuttichal	19-03-2020



2. Kollam district:

BMC meetings held in Kollam district

Sl. No	Name of BMC	Date of meeting
1	Karunagappally Municipality	10.06.19
2	Alappad Grama Panchayat	18.10.19
3	Thekkumbhagum Grama Panchayat	28.10.19
4	Kulakkada Grama Panchayat	06.12.19
5	Neduvathoor Grama Panchayat	06.12.19
6	Thazhava Grama Panchayat.	09.12.19
7	Sooranad Grama Panchayat	11.12.19
8	Adichanallor Grama Panchayat.	19.12.19
9	Sooranad North Grama Panchayat	20.12.19
10	Alappad Grama Panchayat	20.01.20
11	Thekkumbhagum Grama Panchayat	20.01.20



3. Pathanamthitta district :

BMC meetings held in Pathanamthitta district

Sl. No	Name of BMC	No. of BMC meetings convened
1	Konni Block	1
2	Adoor Municipality	3
3	Pandalam Municipality	3
4	Thiruvalla Municipality	1
5	Mallappuzhassery Grama Panchayat	8
6	Kozhencherry Grama Panchayat	2
7	Pramadom Grama Panchayat	1
8	Kulanada Grama Panchayat	2
9	Thumbamon Grama Panchayat	1
10	Aranmula Grama Panchayat	1
11	Chenneerkara Grama Panchayat	1
12	Pallickal Grama Panchayat	4
13	Kottangal Grama Panchayat	1
14	Ayiroor Grama Panchayat	2
15	Kottangal Grama Panchayat	3
16	Eraviperoor Grama Panchayat	1



Various programs conducted by BMCs in Pathanamthitta district related to environment

4. Alappuzha district:

BMC meetings held in Alappuzha district

Sl. No	Name of BMC	Date of meeting
1	Muhamma	26/9/2019 & 28/2/2019
2	Karuvatta Model BMC	14/10/2019 & 25/2/2019
3	Veeyapuram Model BMC	05/11/2019
4	Kuthiyathodu	06/11/2019
5	Kavalam	13/11/2019
6	Ramankary	14/11/2019

7	Thakazhi	15/11/2019
8	Thykkattussery	16/11/2019
9	Kainakary	21/11/2019
10	Pallippadu	26/11/2019
11	Kandalloor	28/11/2019
12	Neelamperoor	30/11/2019
13	Puliyur	05/12/2019
14	Cherthala south	15/1/2020
15	Thrikkunnappuzha	27/1/2020 & 24/2/2020
16	Cheruthana	29/1/2020
17	Aryadu	5/3/2020



Various programs conducted by BMCs in Alappuzha district related to environment

5. Kottayam district:

BMC meetings held in Kottayam district

Sl. No	Name of BMC	Date of meeting
1	Ramapuram	20/06/2019
2	Ayarkunnam	29/07/2018
3	Changanassery Municipality	02/08/2019
4	Payippad	06/09/2019
5	Kumarakom	18/10/2019
6	Thiruvarpur	18/10/2019
7	Ayarkunnam	22/10/2019
8	Kaduthuruthy	23/10/2019
9	Changanassery Municipality	29/10/2019
10	Ramapuram	02/11/2019
11	Kadaplamattam	18/11/2019

12	Kaduthuruthy	21/11/2019
13	Changanassery Municipality	25/11/2019
14	Ramapuram	27/11/2019
15	Kooroppada	30/11/2019
16	Kangazha	11/12/2019
17	Ayarkunnam	12/12/2019
18	Aymanam	13/12/2019
19	Chirakkadavu	16/01/2020
20	Njeezhoor	07/02/2020
21	Madappally Block Panchayath	15/02/2020
22	Ayarkunnam	25/02/2020
23	Poonjar Thekkekkara	06/03/2020
24	Ramapuram	09/03/2020

6. Idukki district

BMC meetings held in Idukki district

Sl. No	Name of BMC	No. of meetings held
1	Purappuzha	5
2	Manakkad	4
3	Velliyamattom	5
4	Alakode	1
5	Edavetty	2
6	Thodupuzha municipality	4
7	Karimannoor	2
8	Udumbannoor	2
9	Kodikkulam	2
10	Karimkunnam	1
11	Arakkulam	2
12	Kudayathoor	1
13	Muttom	2
14	Chakkupallam	2
15	Peruvanthanam	2
16	Elappara	2
17	Peermade	3
18	Upputhara	2
19	Ayyappancoil	3
20	Kumily	2
21	Vandiperiyar	2
22	Udumbanchala	2
23	Pambadumpara	2
24	Marayoor	2
25	Kanthalloor	1
26	Munnar	3
27	Mankulam	2
28	Vattavada	1
29	Chinnakkanal	2
30	Senapathy	1
31	Marayoor	2
32	Rajakkad	1
33	Rajakumari	1
34	Vannappuram	3
35	Idukki, kanjikkuzhi	2
36	Vazhathope	1
37	Mariyapuram	5
38	Kamakshi	1
39	Kanjayar	1
40	Erattayar	2
41	Vathikudi	1
42	Konnathadi	4
43	Vellathooval	2
44	Pallivasal	2
45	Adimaly	3
46	Karunapuram	1
47	Nedumkandom	1
48	Kattappana block panchayat	1
49	Thodupuzha block panchayat	1

In Idukki district, KSBB field staffs coordinated with Forest department in taking legal action against 5 persons for attempting to smuggle *Cyathea crinita* (a tree fern) from Mathap in Munnar



Biodiversity Heritage Museum at Velliyamattom Grama panchayath

7. Ernakulam district:

BMC meetings held in Ernakulam district

Sl. No	Name of BMC	Date of meeting
1	Njarakkal	27/09/2019
2	Poothrikka	04/10/2019
3	Kadammakkudy	14/10/2019
4	Avoly	25/10/2019
5	Kuttampuzha	26/10/2019
6	Cheranelloor	28/10/ 2019
7	Poothrikka	04/11/2019
8	Karumalloor	08/11/2019

9	Ayyampuzha	11/11/2019
10	Kuttampuzha	13/11/2019
11	Parakkadav	15/11/2019
12	Piravom Municipality	21/11/2019
13	Chendamangalam	22/11/2019
14	Thiruvaniyoor	29/11/2019
15	Choornikkara	06/12/2019
16	Aluva Municipality	11/12/2019
17	Poothrikka	04/01/2020
18	Rayamangalam	20/01/2020
19	Kalloorkkadu	11/02/2020

8. Thrissur district:

BMC meetings held in Thrissur district

Sl. No	Name of BMC	Date of meeting
1	Kolazy	2/9/2019
2	Kodakara	16/9/2019
3	Elavally	20/9/2019
4	Thrissur corporation	24/9/2020
5	Irinjalakuda	3/10/2019

6	Ellavally	13/10/2019
7	Madakathara	24/10/2019
8	Mulankunnathukavu	28/10/2019
9	Thrissur Corporation	30/11/2019
10	Annamanad	5/12/2019
11	Vellangalur	16/12/2019



Publishing Biodiversity register of Elavally grama panchayath Thrissur district

In Thrissur district, Pavaratty BMC was actively involved conducting an enquiry in to the mass death of indigenous fishes at a pond named ponnankulam at Pavaratty GP. On the basis of the suggestions of TSG member, Pollution Control Board and Fisheries Department were contacted by BMC's and was requested to submit detailed study. As per the study, Pollution Control Board and Fisheries Department reported that sudden depletion in oxygen level in pond due to rise in temperature led to fish death.

9. Palakkad District:



Kerala Science Congress 2020, Palakkad

BMC meetings held in Palakkad district

Sl. No	Name of BMC
1	Kulukallur
2	Lakkidiperur
3	Sreekrishnapuram
4	Thachanattukara
5	Thirumittacode
6	Vellinezhi
7	Anaganadi
8	Anakkara
9	Elappully
10	Kannadi
11	Kappur
12	Karimba
13	Keralassery

14	Kizhakkenchery
15	Kongad
16	Kongad
17	Koppam
18	Kumaramputhur
19	Mankkara
20	Mannarkkad municipality
21	Muthuthala
22	Nagalassery
23	Ongallur
24	Palakkad municipality
25	Shornur municipality
26	Vadakkenchery
27	Vilayur
28	Parali

10. Malappuram district :

BMC meetings held in Malappuram district

Sl. No	Name of BMC	Date of meeting
1	Pothukallu	28.8.2019
2	Malappuram Municipality	21.8.2019
3	Malappuram Municipality	22.8.2019
4	Malappuram Municipality	27.8.2019
5	Malappuram Municipality	29.8.2019
6	Oorngattiri	31.10.2019
7	Malappuram Municipality	31.10.2019
8	Oorngattiri	1.11.2019
9	Aliparamba	2.11.2019
10	Ponnani Municipality	15.11.2019
11	Tirur Municipality	15.11.2019
12	Perintalmanna Municipality	24.11.2019

13	Kannamangalam	28.11.2019
14	Ponnani Municipality	5.12.2019
15	Tirurangadi Municipality	27.12.2019
16	Malappuram Block	27.12.2019
17	Manjeri Municipality	30.12.2019
18	Perumpadappu Block	30.12.2019
19	Nilambur Municipality	24.1.2020
20	Nilambur Municipality	26.1.2020
21	Malappuram District Panchayat	31.1.2020
22	Tirurangadi Block	20.2.2020
23	Malappuram Municipality	2.3.2020
24	Ponnani Municipality	5.3.2020
25	Ponani Block	7.3.2020



Children's Biodiversity Congress conducted at Malappuram district

11. Kozhikode District:

BMC meetings held in Kozhikode district

Sl. No	Name of BMC	Date of meeting
1	Thamarasseri	October 2019
2	Kuruvattoor	October 2019
3	Olavanna	October 2019
4	Feroke Municipality	October 2019
5	Kodiyathur	November 2019
6	Vanimel	November 2019
7	Naduvannur	November 2019
8	Kattippara	November 2019
9	Narikkuni	November 2019
10	Azhiyur	November 2019
11	Thiruvambady	November 2019
12	Madavoor	November 2019

13	Koodaranhi	November 2019
14	Thalakkulathoor	November 2019
15	Thamarassery	November 2019
16	Omasseri	November 2019
17	Kakkoor	November 2019
18	Kattippara	November 2019
19	Kodenchery	November 2019
20	Kizhakkoth	November 2019
21	Chelannur	November 2019
22	Koodaranhi	December, 2019
23	Kakkodi	December, 2019
24	Nanminda	December, 2019
25	Mavoor	December, 2019
26	Olavanna	December, 2019
27	Peruvayal	December, 2019



Various programs conducted by BMCs in Kozhikode district related to environment

12. Wayanad District:

BMC meetings held in Wayanad district

- In Wayanad district, Thavinjal BMC and Vythiri BMC passed resolutions and banned cutting and sale of Ochlandrae which is being cleared extensively and taken to Kottiyam temple as part of temple festival

- Thirunelly BMC passed resolutions and banned any type of human interference in Ondayangadi Forest Plantation.
- Pulpally BMC banned planting *Senna spectabilis*.

Sl. No	Name of BMC
1	Mullankolli
2	Pulpally
3	Noolpuzha
4	Nenmeni
5	Poothadi
6	Ambalavayal
7	Muttill
8	Meenangadi

9	Vythiri
10	Pozhuthana
11	Padinjarathara
12	Thirunelly
13	Thondarnadu
14	Thavinjal
15	Mananthavady
16	Panamaram
17	Edavaka

13. Kannur District:

BMC meetings held in Kannur district

Sl. No	Name of BMC	No. of meetings held
1	Payyannur MP	04/09/2019
2	Chirakkal GP	06/09/2019
3	Kolayad GP	07/09/2019
4	Kurumathur GP	09/09/2019-
5	Anthur MP	17/09/2019
6	Kolayad GP	30/10/2019
7	Chengalayi GP	31/10/2019
8	Payyannur MP	01/11/2019
9	Valapattanam GP	04/11/2019
10	Pappinissery GP	22/11/2019
11	Mattannur MP	23/11/2019

12	New Mahe GP	02/12/2019
13	Madayi GP	03/12/2019
14	Pariyaram GP	10/12/2019
15	Alakkode GP	16/12/2019
16	Eramam-kuttur GP	13/01/2020
17	Muzhakunnu GP	16/01/2020
18	Kolachery GP	18/01/2020
19	Kolayad GP	21/01/2020
20	Cheruthazham GP	24/01/2020
21	Naduvil GP	25/01/2020
22	Kolachery GP	04/02/2020
23	Kurumathur GP	20/02/2020
24	Alakkode GP	06/03/2020
25	Kolachery GP	09/03/2020



Publishing Biodiversity Register



Visit of BMC members in local BHS at Eyambharanithuruthu

- » **Kidoor quarry issue (Kumbala GP):** Based on a letter received from Kasaragod district collector, a technical study was conducted on the status of bird life in the vicinity of a proposed granite quarry/mine by M/s Devatharu Agro-venture Pvt. Ltd. in the Kidoor village of Kumbala GP where the first bird village (pakshigramam) is being established by a team comprising of RFO Kasaragod, TSG members, BMC members and KSBB Kasaragod Staffs. The report was submitted to District collector, KSBB HQ, and Kumbala BMC for further actions.
- » **Tower issue (Pilicode GP):** A Janakeeyaprathirodhasamithi of Pilicode GP had given a complaint against the establishment of a mobile tower in the village to KSBB. A study regarding this issue was conducted by a team comprising of RFO Kanhangad, Zoological Survey of India, TSG member, BMC members and KSBB Kasaragod staffs and the report was submitted to HQ and Pilicode BMC.



6. Biodiversity Research & Technical

Major achievements

1. Impact assessment study of flood and natural disasters on Biodiversity with support of 28 institutes completed
2. Ecosystem valuation of the Kadalundi-Vallikkunnu with the support of CMFRI completed
3. Preparation of Red data book of Kerala is on-going with the support of Jawaharlal Nehru Tropical Botanical Research Institute (JNTBGRI), Zoological Survey of India (ZSI) and Central Marine Fisheries Research Institute (CMFRI)
4. Conservation of Sacred groves- work is on-going with the support of Malabar Botanical Garden
5. Project on Propagation protocols on endangered plants listed under MoEF notification is on-going with the support of JNTBGRI
6. Rebuild Kerala Initiative (RKI) projects - work initiated
7. Biodiversity study of Neyyambkayam completed

6.1. Biodiversity Studies:

1. Impact of flood and natural disasters on Biodiversity

During 2018-19 KSBB had conducted Impact Assessment of floods on Biodiversity in 187 LSGs by BMC. Such an assessment with the active involvement of State-District-BMC mechanisms through intensive trainings and survey is the first of its kind initiative in the country. Various PRA tools were used to generate the data on impact of livelihood, biodiversity loss, landscape devastation, and the wash away of floral and faunal components. The highlights of the program were:

- Training for 187 BMCs was provided wherein hands on training for conducting field survey and focal group discussions were provided
- 635 volunteers trained in Biodiversity survey techniques
- 13 district level meetings under chairmanship of District Panchayat President conducted
- 374 BMC meetings conducted
- 3 State level core committee meetings conducted

The study concluded that 771 different landscapes including riverine, forest, plantations and agricultural fields were affected. About 287 varieties of agricultural crops, 1053 Flora and 695 Fauna were affected. As a follow-up to this study, areas requiring attention was prioritized and 28 studies related to assessment of impact of floods/ landslides on Biodiversity and ecosystem with special

emphasis on Riverine rejuvenation were awarded to R & D institutions and Universities in Kerala. (Annexure)Each of the institution submitted their study reports to BMC of the respective locality.

The studies covered the following aspects:

1. Impact of natural disasters on Terrestrial ecosystem in high ranges of Kerala Wayanad, Palghat (Palghat gap area, Nellimpathy, Attapady), Idukki and Thrissur (Athirapally)
2. Impact of flood on riverine vegetation of Pamba, Periyar, Chalakudy, Bharatapuzha, Kallai, Chaliyar, Achenkovil, Manimala, Korapuzha and Kuttiyadi river
3. Impact of floods on Mangrove ecosystem of Mangalavanam, Pathiramanal, Pallipparam, and Perumbalam
4. Impact of landslides and floods on Tribal livelihood in Attapady and Athirapally
5. Impact of flood on Agriculture- Alapuzha (Kuttanad) and Wayanad
6. Impact of flood on Soil biota of Pamba, Periyar and Chalakudy
7. Spread of Invasive species due to flood

Based on this KSBB prepared a report “ A concise report on Biodiversity loss due to 2018 flood in Kerala”which is the outcome of the detailed investigations, and discussions with various stakeholders and experts. It is anticipated that the findings and recommendations of the study would serve as a document for developing an ecosystem based restoration for Kerala State in order to build resilience to such catastrophic events in the future.

The key findings and recommendations of this study are detailed below:

- The natural and anthropogenic drivers responsible for 2018 floods in Kerala and to the resultant impact on Biodiversity include (1) high-intensity rainfall in short period (2) deforestation and blockage of natural streams (3) reclamation of wetlands due to urbanization (4) unscientific developmental activities in ecologically sensitive areas (5) promotion of invasive/ exotic species etc.
- The studies in Attapady, Palghat gap region and Wayanad point out that slope and elevation are major triggering factors of landslides. Lithology also influence land stability. The landslides, land subsidence or mudslips happened in inclined planes where the slopes were between 22 – 28°, mainly in forest fringes where there is disruption of slope continuity by way of any type of construction such as Quarrying in vulnerable areas, resort, road, bridges etc. Activities like deforestation, unscientific cultivation practices, urbanization, land reclamation etc. influence the incidence of landslides. Areas with sparse vegetation are more prone to landslide in contrast to densely vegetated areas. Agriculture in steep slope increases the susceptibility of landslide. Slopes above 45° did not record much landslide event, since they are mostly barren rock surfaces. The other major parameters that influence the landslides are the presence of charnokite/charnokite gneiss, highly dissected structural hills and valleys, and Barren/waste land. In Athirapally the roads along the hilly terrain with slope ratio 1:3.2 were the actual impact locations of the landslides.
- It was recommended that the steep cutting or the straight running streams and streams falling from steep terrains with more than 70 % catchment above with degraded natural vegetation in the hill terrain shall be notified as ‘Vulnerable zones’ of landslides and making residential zones downstream to such areas should be avoided. Soil-stripping by landslides largely reduces the productivity of forests. The hills and hill slope shall maintain at least 30 % natural vegetation or mixed cropping including diverse natural tree growth. Clearing of the natural vegetation at the top of the hills shall be banned and ecorestoration of natural vegetation shall be promoted in hill

tops and bioengineering techniques can be adopted to stabilize and recover the landslide affected and susceptible areas. Microlevel landslide hazard zonation map of all LSGs in a 1:2500 scale (2.5 m spatial resolution) needs to be prepared which will help in spatial planning for avoiding unsustainable and non-resilient developmental activities. A ground survey should be done to understand the hazard susceptibility zones in each LSGs and efforts to record events of all land movements, particularly in very high and high hazard zones should be undertaken. This will help BMCs and LSGs while taking decisions on developmental activities.

- Systematic updation of PBRs on grid basis need to be done so that it can be used as a ready reference for natural resource and land use change for preparing Landscape level Local Action Plan for Biodiversity (LBSAP).
- Excess drying up of ground vegetation and Increase in forest fire during February – March 2019 was noted when compared to last year, and this may be due to the change in drainage regime along with the increase in summer temperature
- Based on detailed consultations with various experts' criteria was developed for prioritizing the flood/landslide affected riparian areas for intervention by local bodies/ BMCs at various stages. The major factors considered are: i) Physical impact of the flood/ landslide to the riparian areas, ii) Distribution of species with conservation importance, iii) Distribution and spread of invasive species and iv) Riparian land use classes.
- Proper management of waterways across the roads was also one of the issues flagged. i.e the dimension of the Chappath or Culverts shall be made assessing the order, slope and water level in the extreme monsoon.
- Areas were prioritized for recovery measures at Periyar, Pamba, Bharathapuzha and Chalakudy river. Riparian vegetation for recovery process were prioritized. Clearing the weeds and obstructions in the flood escaping routes of Pampa river Varattar, Uttathra Palliyar, Illimalathode, Kuttanperoor river, Arithod Kolara river is recommended. A river basin- watershed level approach for development planning and approval from LSGs/River Basin advisory body is necessary.
- Declaration of the Riparian forest areas along with river stretches into Community protected area eg : the unique low elevation riparian forests in the Athirapilly Grama Panchayath and the nesting sites of Hornbill protected by Kadar indigenous community are some of the other recommendations.
- Out of the 545 plants identified as having high conservation value in river banks, 334 are found medicinally used in various traditional systems like Ayurveda, Siddha, Unani, Homeopathy, Folk, Tibetan, Chinese etc. and also in Modern medicine and Veterinary medicine. The medicinal plants diversity is high in Periyar (215 species), followed by Pampa (185 species), Chalakudy (165 species) and lowest in Bharathapuzha (154 species). The study also identified 214 species with various local importance and is found to be beneficial in checking river bank erosion, stabilizing banks, and controlling floods etc. The diversity of plants having high local importance is highest in Chalakudy (137 species), followed by Periyar (135), Pampa (123) and lowest in Bharathapuzha (51 species). 31 plants out of the 214 locally important species are in the IUCN threatened list (3 CR, 12 EN and 16 VU category) and 89 of them are endemic (5 Kerala, 45 Southern Western Gats, 25 Western Gats, 10 Peninsular India and 2 India endemic).
- In general, considering the percentage of species affected and the number of species dried off and uprooted/washed out, the impact is highest in Pampa followed by Periyar and Chalakudy. In the endemic category 47 out of the 197 species were affected. The highest number is in Chalakudy River with 29 species followed by Periyar (25), and Pampa (23) and least in Bharathapuzha with

12 species.

- The study has developed a criterion for identification of species for future River bank afforestation programs and prioritized number of species suitable for various locations depending upon the bank condition, utility etc. and this can be used for various river bank afforestation programs. The parameters considered for this are: IUCN Red Listed Species, Endemic Plants, Medicinal value of species, Local Importance of the species and Plants mostly growing very close to or inside the River. In Manimla River bank protection can be enhanced with the native species like *Pandanus furcatus*, *Talipariti tiliaceum*, *Thespesia populnea*, *Ochlandra sp.*, *Ficus exasperata*, *Ochreinauclea missionis*. The guard vegetation may be strengthened with endemic species *Hydnocarpus macrocarpa*, *Humboldtia decurrens*, *Vateria indica*, *Hopea erosa*, *Cinnamomum perrottetii*. The species like *Talipariti tiliaceum*, *Thespesia populnea*, *Ochlandra sp.*, *Ficus exasperata*, *Ochreinauclea missionis* are found resistant against the flood due to the webbing of the stilt roots, while the *Bambusa vulgaris* reed due to adventitious root system fail to be a good barrier against the flood, instead it can cause blocking the water flow.
- In Kuttanad the study points out an increasing trend in salinity, year after year in the Vembanad lake and Kuttanad region during post monsoon months, partly due to the environmental effects of the hydrological modifications at Cochin bar mouth as part of the Vallarpadam Container Terminal Project, and poor inflow from river systems during post monsoon months-probably induced by climate variability. The study indicates that the area under varshakrishi in Alapuzha and Kottayam is increasing lately and over 45 % of the land area under rice is put to use for varshakrishi in Kuttanad. Although it is recommended to limit the varshakrishi to not more than 30% this is not generally followed reducing the space of flood waters and augmenting the severity of floods. The incursion of saline water to upstream regions of Thanneermukkom barrage during 2018 prior to the flood indicate that despite closure of the barrage saline incursion beyond permissible levels can only be attributed to extreme reduction of water level. The situation calls for efforts for maintaining a minimum seaward environmental flow in the wetland by storage of water in the flood plains. The suggestion to utilize the uncultivated Padasekharam in Kuttanad seasonally as water storage structures during rainy season assumes relevance in the context of climate change related water stress. Polders can be used as seasonal flood water storage systems, and fish reproduction protection zones for endemic fishes. The physical obstruction of barrage has led to alteration of upstream and downstream migration of giant river pawn and prawns with poor swimming ability was washed downstream in flash floods.
- The loss of canopy cover promoted the profuse growth of several invasive and weedy taxa that thrives in bright sunlight. The primary colonizers are invaders with high ecological amplitude like *Mikania*, *Lantana* etc. The landslides resulted in gap formation, which causes changes in microenvironment and community dynamics. Larger gaps raise the probability of taking over of shade in tolerant species and the spread of invasive species. Studies have shown that much of the climax species found in the Western Ghats are having recalcitrant seeds. Adding to this since some slides are close to forest margins, there is an increased chance of establishment of invasive species and spreading to forest areas.
- The catastrophic floods in August 2018 resulted in the first-ever records of several additional alien species from natural waters, revealing the existence of an unregulated, unscientific, mostly illegal and thriving aquaculture and aquarium fisheries sector based on alien species, especially along the riverine floodplains. These included large-bodied and high-risk species such as the *Arapaima* (*Arapaima gigas*) and *Alligator gar* (*Atractosteus spatula*), top predators capable of feeding on a range of organisms and a serious threat to the endemic fish diversity of the WG region. A total of 134 invasive plant species were identified and documented from 17 villages of Karthikappally

Taluk, Alapuzha. Of these 27 plant species (Terrestrial and Wetland) were found to totally invade the whole agricultural fields replacing the crops while others showed only partial invasion. An Invasive species Management Plan should be developed by the local bodies and BMCs which can include identification of priority areas, and control measures using the workforce from MNREGS. The plan shall assign a priority score to each invasive species based on its potential impact, current distribution, the value of the habitat it invades, and the difficulty of its control.

- Identification of appropriate sites for mangrove cultivation can be done based on soil stability, flooding regime, elevation, extent of pollution. The density of crabs and gastropods as “indicator species” in Mangalvanam Birds Sanctuary are reduced significantly and should be monitored. The indicator species (fishes, crabs and molluscs) were drastically reduced in Kadamakkudy also. Temporary ‘flooded mangrove nursery’ can be established in low intertidal areas, which are regularly flooded by tidal waters. This kind of nursery will provide seedlings for one or two-year planting projects, and requires less effort in terms of setup and maintenance.

2. Ecosystem valuation –Kadalundi Vallikunnu Community Reserve

The Kadalundi-Vallikunnu Community Reserve is the first community reserve of the State of Kerala. The project “Valuation of Marine and Coastal ecosystem in Kadalundi Vallikunnu Community Reserve” has documented the present status of biodiversity of area including Mangroves, Mangrove associates, Molluscs, Birds, Fishes, Crabs, Shrimps, Phytoplanktons and Zooplanktons. The major threat to the estuary identified was the presence of invasive species especially a brackish water mussel native of Central and South America. Sand bar formation, Pollution etc is other major issues identified and the project also highlights the management options for the area. The estimated total economic value of the reserve is Rs 56.11 million and average net revenue by fishing is Rs 3.00 crore.

3. Preparation of red data book and assessment of threatened species of Kerala

KSBB during the reporting period has initiated a project for listing comprehensive details of floral and faunal species under various threatened categories of IUCN, Scheduled species, and other notifications/ legislations in Kerala with the support of Jawaharlal Nehru Tropical Botanical Research Institute (JNTBGRI), Zoological Survey of India (ZSI) and Central Marine Fisheries Research Institute (CMFRI). The main Objectives are:

- a. Preparation of Red data book (Marine flora and fauna/ Flora including aquatic species/ Fauna including fresh water fauna) falling under different categories of protection listed under IUCN and various other national and international regulations
- b. Developing a priority list of species for conservation and local action and species to be notified under section 38 of BD Act
- c. Suggest recommendations for sustainable management measures for commercially important species under differed categories as Total ban, regulated ban, seasonal ban etc. based on prioritization index.

4. Conservation of Sacred Groves :

Preparation of Detailed Project Report for the conservation of sacred groves with action plan, time line, responsible agencies, sources of funds etc. under the project on Enhancing Coastal and Ocean Resources Efficiency (ENCORE) of National Centre for Sustainable Coastal Management, MOEF funded by World Bank is ongoing with support of Malabar Botanical Garden. The major Objectives are:

- Inventory of Sacred groves in 113 panchayats in the 9 coastal district with area, location and ownership details
- Biodiversity documentation of sacred groves and associated traditional knowledge
- The status of Sacred groves, prioritization of areas based on Plant diversity Index and occurrence of Rare and endangered plants
- Development of a restoration plan with community participation

5. Propagation protocols on endangered plants listed under MoEF notification :

The Board has entered into a long term collaboration with JNTBGRI for germplasm conservation (both *in-situ* and *ex-situ*) of endangered plants notified as per Section 38 of Biological Diversity Act 2002. The major work undertaken during the reporting period includes:

- *Paphiopedilum druryi* planted in 10 locations at Agasthyamala in groups of 7-20 plants. 36.8% of seedlings of *P. druryi* survived after one year of planting at Agasthyamala. .
- Restoration of *Vanda thwaitesii* was done in Idukki WLS and Kuttiyamvayal reserve forest of Wayanad. 73.9 % survival was observed in Idukki.
- Isolation and characterization of symbiotic fungus from *P. druryi* and utilization in restoration is under progress.
- Survey and population study of *Decalepis arayalpathra*, *Axinaea pauciflora*, *Garcinia imberti*, *Humboldtia bourdillonii*. Prain and *H. uniuga* - Documentation of populations, collection of seeds from different populations for their propagation is progressing.
- Projected population in the whole study area in 9 localities of *D. arayalpathra* is 20,884 adults and 6,732 saplings

6. Rebuild Kerala Initiative Projects

1. Conservation of Agrobiodiversity

The homesteads of Kerala are described as centres of tropical biodiversity similar to tropical forest ecosystem and they are one of the most productive units of land. Home gardens maintained by custodian farmers are not only important sources of food, fodder, medicines, spices, herbs and, flowers, but are also important for the *in situ* conservation of a wide range of farmers varieties, landraces and wild crop relatives. The Rapid impact assessment study carried out by KSBB points out the continuous loss of diversity of Agricultural crops earlier used by farmers and it was recommended that an Agro ecological approach to the agricultural sector with climate-resilient locally adapted cropping pattern may be promoted and thrust given to on farm conservation and conservation in Community gene banks. Hence, a project for on farm conservation of Agrobiodiversity through Custodian farmers is initiated through Rebuild Kerala Initiative in eight districts of Kerala.

2. Riverine Biodiversity Rejuvenation

The studies conducted post 2018 floods suggested that recovery strategies should be site specific, eco-friendly and based on a landscape and ecosystem approach for disaster risk reduction based on the concept of “Room for River”. The impact on riparian vegetation in Pamba, Periyar, Chalakudy and Bharatapuzha was studied and altogether in the four rivers 12% of areas is in very high priority and needs immediate intervention. There are 39% area for second stage intervention, 32 % for long term intervention and remaining 17% requires not much intervention. The areas for immediate intervention are highest in Periyar, Pampa, Bharatapuzha and Chalakudy. A Riverine biodiversity rejuvenation project in selected flood affected panchayats of Pamba river is initiated through Rebuild

Kerala Initiative to conserve the natural flora of the area, ecosystem restoration of the river banks to provide a green space for academic, research and recreational purposes.

3. Database of Tradable/Commercially Potential Bioresources and their Economic Valuation in Kerala

Kerala is a biodiversity rich state and many economically important plant and marine species are found in Kerala. The main challenges facing Kerala in the implementation of the ABS provisions of the Act and regulation of unsustainable harvesting of bioresources is the fact that the state had inadequate information on biological resources, their actual and potential economic value, and the potential for their use. The project funded as part of RKI aims to document the information on traded bio-resources in the 14 districts of Kerala and aim to put in place an institutional framework for implementation of ABS in Kerala and regulation of unsustainable harvesting of bioresources.

6.2. Externally funded projects

1. High Range Mountain Landscape Project

Ministry of Environment, Forest and Climate Change, Government of Kerala and United Nations Development Programme with the support from the Global Environment Facility is implementing a project India High Range Mountain Landscape Project for developing an effective multiple use management framework for conserving biodiversity in the mountain landscape of the Western Ghats. KSBB is conducting two studies for analyzing the land use changes and impact on Biodiversity in the project area and documentation of flora, fauna and ecosystem diversity in 11 selected Grama Panchayats in the three Districts of Idukki, Ernakulam and Thrissur.

Key outputs :

1. Major gap identified in the lower group of plants, fauna and biodiversity of forest areas. Lack of standardized methodology for data collection is a major issue identified.
 2. Two State level workshops and three consultative meetings with experts/ consultants were held for developing a PBR updation methodology
 3. Classes, awareness programmes and interactive sessions were conducted for Panchayat officials and BMCs in 10 panchayats. Focal Group Discussions with knowledge providers conducted in 10 panchayats. Visited 15 tribal settlements during the field work and documented the key issues
 4. Data of 95 Algal species, 194 species of Lichens, 202 species of Bryophytes, 1148 medicinal plants, 6 species of wild edible fruits and 17 selected tradable bio-resources in the study area are compiled .
 5. Seven sectors were prioritized for analyzing land use changes and the required maps procured and preparation of GIS maps to analyze the land use change is ongoing. Impact of various sectors, as Plantations & Horticulture, Animal Husbandry, Tourism, and Transportation on land use was studied
 6. Biodiversity survey at Mankulam Grama Panchayat completed. The survey at Mankulam documented 50 species of birds, 30 species of butterflies and 20 species of odonates.
 7. Documented 4 case studies and 3 best practices in Mankulam which can serve as a model to other panchayats.
2. **National Medicinal Plant Board (NMPB) project** on 'Resource Augmentation, Sustainable harvesting and value addition of Medicinal plants resources through Biodiversity Management Committee (BMC's)', Wayanad district, Kerala State.

This project is currently being implemented at Thirunelli, Poothadi, Noolpuzha, Thavinjal and Pozhuthana Gramapanchayat of Wayanad district. It is a model project implemented through BMCs of 5 Gramapanchayat (GPs) at grass root level. The project is now in the final stage and some of the notable achievements of the project includes,

- Organized seminars/workshops exclusively for the target groups and prepared a working plan for the effective implementation of the project. A handout was published for the benefit of the target group.
- Produced more than 50,000 saplings of various medicinal plants and planted in 2 hectare lands available in 5 GPs as envisaged in the project.
- Completed the construction of warehouse and drying yard in 5GPs and effective steps have been taken to utilize these infrastructure facilities for storage purpose of medicinal plants followed by marketing directly to the Ayurvedic Medicine manufactures through buy back arrangements to avoid the exploitation of middleman.
- On experimental basis, machinery and equipments have been installed at Thirunelli GP and is ready for operation. These facilities are meant for semi processing like chopping and powdering of dried medicinal plants.
- As a part of value addition programme, trainers training programme was conducted thrice involving the selected target groups like Kudumbasree, self-help groups, farmers tribal healers, VSS, EDC etc. to produce 6 Home Remedies that are useful in primary health care of the people.
- A hand book was published exclusively for introducing good collection, processing and storage practice among the target group. An exclusive training programme in field is already initiated.
- After the review of the project, and works so far carried out, it is identified that the functioning of the BMCs has to be strengthened and in view of this, a Medicinal plant trust have been registered in each GPs under the patronship of BMCs. The ultimate objective of the Trust formation is to ensure the sustainability.

3. FAO supported project on ‘Strengthening Agriculture and Allied Sector Contributions to India’s National Biodiversity Action Plan (NBAP) 2008 and National Biodiversity Targets (NBTs)’

The Ministry of Environment, Forest and Climate Change (MoEF&CC) and the National Biodiversity Authority (NBA) with the Food and Agriculture Organization (FAO) of the United Nations, implemented a project titled “Strengthening Agriculture and Allied Sector Contribution to India’s National Biodiversity Action Plan (NBAP) 2008 and National Biodiversity Targets (NBTS) 2014” under FAO’s Technical Cooperation Programme (TCP). The project was implemented in the states of Punjab, Kerala and Mizoram through 2017-2019. The Final National Workshop for the FAO-supported project was held on 16th December 2019 at New Delhi. In this concluding workshop the FAO team and state partners presented key outputs of the project. The project with technical assistance of KSBB was implemented by CDS and KILA in Kerala. As part of project a comprehensive review of agriculture and allied sectors commitments at state and local levels to agrobiodiversity conservation and reporting as per the NBAP 2014 was conducted. A need to develop mechanisms that address improved production and productivity through the practice of agroecological farming systems and implementing mechanisms that promote sustainable agriculture at the grassroot level are the main issues flagged. The project also served to enhance capacity of stakeholders mainly BMCs engaged in the conservation and use of Agrobiodiversity at Alappuzha. A training module for BMC for Conservation of Agrobiodiversity was also developed as part of this

4. NBA funded project on “Strengthening Local Self Governments to integrate Biodiversity Conservation in the local development plans through participatory community action” :

The project aims to build awareness on BD act in Wayanad and documenting the process of formation of new BMCs and is being implemented by M S Swaminathan Research Foundation (MSSRF). The prime interest of this project is to empower the local self governments to take decisions on biodiversity governance through awareness building on existing legislative frame works in India and to integrate that in the local development planning through participatory community action. The approved objectives have been successfully achieved

6.3. Major reports submitted:

1. Environment Poisoning from Pineapple farms in Kerala: A Preliminary Study:

The Hon'ble High court of Kerala in an order dated 5th January 2018 had suo moto impleaded Kerala State Biodiversity Board (KSBB) as an additional respondent in the writ petitions WP (C) No 34602, 37983, 38441 of 2017. KSBB was directed to file an affidavit answering the contentions that the pesticides, weedicides and hormones used for cultivation of Pineapple detrimentally affect the life and health of public. A study on “Environment Poisoning from Pineapple farms in Kerala: A Preliminary Study” were conducted in Pathanamthitta, Kottayam and Idukki through Tropical Institute of Ecological Science, Thrissur and report submitted to the Hon'ble High Court. The Kerala State Organic farming Policy strategies and Action Plan brought out by KSBB had recommended to Phase out Chemical Pesticides and Fertilizers from the farming sector and to Regulate the sale and use of pesticide through necessary legislations, enforcing a prescription based system ensuring that pesticides are sold only on a case-to-case basis after obtaining prescription from the Agriculture Officer. The report submitted by Board specifically pointed out the obligations of the Government to bring in stringent stipulations and guidelines to control excessive usage of pesticides in Pineapple farms. The Hon'ble High Court has given directions to Government to take into consideration the recommendations of KSBB and take necessary action.

2. Biodiversity study at Neyyarkayam

Chandragiripuzha, one of the longest and biggest rivers of Kasargode district is a perennial river with surplus water throughout the year. The river supports diverse fish species and 52 species have been reported from here. Unsustainable utilization of water and sand mining has led to drying up of pools at Neyyarkayam at Bovikkanam. The study commissioned by Kerala State Biodiversity Board provided an in depth insight into the recently observed mass mortality of fish here and suggests mitigating measures with the support of Local Self Government and local community. It shows that water management should be based on a participatory approach, involving users, planners and policymakers at all levels.

3. Inland Waterways- Impact of Interlinking of Rivers on Biodiversity: Report to Niyamasabha Paristhithi Samithi

The proposed length of project of Inland waterway from Mahe to Valapattanam is 51 km with 60 m right of way. Of this about 26 km is the river portion falling in Mahe river, Eranjoli river, Dharmadom/ Anjarakandy river and Valapattanam river and the remaining 25 km is the missing link where artificial canal is to be constructed to connect these rivers. The proposed canal will be 40 m wide and service roads are proposed on either sides. The proposed depth will be 1.5m in Phase-I and 2.2 m in Phase-II so as to enable large scale movements of the cargo vessels through the waterway. The report submitted by KSBB suggests conducting a comprehensive EIA with 16 parameters to be included.

6.4 Biodiversity research

KSBB is an approved research centre under Kerala University. The Board is supporting 10 doctoral fellows for conducting research on various aspects of biodiversity. The topics are as follows:

1. Phytochemistry and pharmacology of Ethnomedicinal plants used by Malai Pandaram tribes of Southern Western Ghats
2. Radiometric characterization of native flowers in Kerala
3. A study on the biology of earthworms in the selected areas of Kottayam
4. Diversity and abundance of Hymenopteran parasitoids and pests of rice with special reference to farming practices in Kerala
5. Micropropagation of *Vernonia anthelmintica* and Characterization of Anti-diabetic Compound from its *In vitro* culture
6. Biodiversity assessment and Biomonitoring of Bharathapuzha, Kerala
7. Taxonomy and Diversity of Theridiidae (Araneae) in Kerala.
8. Taxonomy, Systematic & conservation of Nemacheilid loaches (Teleostei: Nemacheilidae) of S W Ghats
9. Taxonomy & molecular Phylogenetics of Wrasses (Labrida) and Puffer fishes (*Tetraodontidae*) of Kerala
10. A comparative study of mixed Sp. bird flocks in a natural forest habitat & selected human modified landscapes in Wayanad

In addition to these, during the reporting period four internships were awarded. Two interns conducted study on Nature of works and size of funds used under MNREGS which led to conservation of biodiversity in selected panchayats in Trivandrum districts. Two interns worked on issues of water pollution in the water body adjacent to Kerala Biodiversity Museum at Vallakkadavu.

6.5 Access and Benefit Sharing

During the reporting period five application in Form I for the commercial utilization of bio resources in Kerala was received from NBA and approval was accorded for one. Six applications were received for research by Indian nationals on Section 38 notified species/ traditional knowledge of tribal communities and approval was granted for five.

6.6 Handling of various environmental issues of the State

As per Govt. Order No. G.O.(Rt)No.19/2019/F&WLD dated 16.01.2019 the Range Forest Officers of the State are designated as the Authorized Officers to enforce the regulatory provisions of the Biodiversity Act, 2002. They shall inform and guide the Biodiversity Management Committee about various violation of BD act in their jurisdiction and also book cases for it under the provisions of section 61(a) of Biological Diversity Act.

KSBB had received complaints from different parts of the State and took appropriate action with the help of concerned Range Forest Officers. A total of 16 complaints were received so far from different Districts, and each one of these environmental and biodiversity issues were studied in detail by a team headed by the concerned Range Forest Officer. The study team comprises a group of Technical expert (KSBB have District-wise Technical Support Group (TSG) for helping BMC's for various Biodiversity Related matters), BMC members and the KSBB staffs.

6.7 Legal cases:

Six court cases relating to ABS are pending in High Court of Kerala. The petitioners are industries commercially utilizing bioresources and the petition is given in response to the order send by KSBB directing all companies commercially utilizing bioresources to comply with provisions of Section 7 of Biological Diversity Act 2002 and Rule 16 of Kerala Biological Diversity Rules 2008

KSBB is respondent to various high court cases related to the submission of Kasthurirangan report on behalf of the Kerala Government to the Central ministry. During the year 2019, 8 cases were registered in Kerala High Court considering KSBB as one of the respondent.

Government orders received:

1. Executive directive to Police officers to hand over cases of violation of BD Act.

The Police department vide Executive directive No 2/2020 /PHQ dated 03/02/2020 has authorized that if any police officers have reasonable grounds to believe that an offence has been committed under the provisions of the Act they shall verify the facts by spot inspection and inform the concerned forest officers to take necessary action. The offences under this Act are cognizable and non-bailable and no court shall take action on any offence except on a complaint made by Authorized officer.

2. G.O regarding Kerala Biodiversity Fund laws.

The Kerala State Government by G.O (Rt No.7/2020/Envnt dated 18/01/2020 has issued an order for the establishment, administration, utilization and auditing of Kerala Biodiversity Fund. The fund is meant for conservation of biological diversity, fair and equitable sharing of the benefits arising out of the use of biological resources and associated knowledge.

3. Locally Important Biodiversity Heritage Areas

Kerala State Government by G.O 5/2020/Envnt dated 03/03/2020 has empowered BMC to notify locally important biodiversity rich area/ ecosystems/ trees as Locally Important Biodiversity Heritage Areas after conducting a preliminary survey with the help of TSG. Any violations of such orders will attract Section 24/ (2) n of Biological Diversity Act 2002. BMC can take action for conservation of such areas as per Section 37 and Rule 19 of the Kerala Biological Diversity rules

4. Operational guidelines for processing of applications for Access to Biological resources received under Section 3 and Section 6 and as mandated by Section 41 of the Biological Diversity Act 2002

As per Section 41 (2) the National Biodiversity Authority and State Biodiversity Board shall consult the Biodiversity Management Committee while taking any decision relating to use of biological resources and knowledge associated with them occurring within the territorial jurisdiction of the BMC. These guidelines approved by the Sub Committee on 25.06.2019 following the 50th Board meeting held on 19.06.2019 aim to provide clarity with respect to processing of applications referred to by National Biodiversity Authority under Section 3 of the Biological Diversity Act 2002 in Form I, and under Section 6 in Form III by KSBB

5. Operational guidelines for processing of applications for Access to Tribal knowledge

The operational guidelines aim to ensure that the regulatory activities of SBBs are compliant with the provisions of the Biological Diversity Act 2002 and the Biological Diversity Rules 2004. These

guidelines approved by the Sub Committee on 25.06.2019 following the 50th Board meeting held on 19.06.2019 aim to provide clarity with respect to processing of applications by applicants for accessing ethnobotanical knowledge relating to tribal communities

6.8 Expert committee meetings held:

1. State level steering committee for biodiversity:

For Mainstreaming Biodiversity in policies and programs of line departments State level Steering Committee for Biodiversity (vide G.O 60/2018/Envtd dated 11/05/2018) with Secretaries of Environment, Local Self Government Department, Water resources, Agriculture, Forest, Fisheries, Tourism, Animal Husbandry, Department of Environment and Climate Change and Chairman KSBB were constituted. During the reporting period two meeting were held on 28.10.2019 and 21.05.2020 chaired by Chief Secretary to Government of Kerala. The major decisions taken included regarding Accreditation of Kudumbasree for undertaking Biodiversity conservation for BMC, Compliance of Public sector industries and industries commercially utilizing biodiversity to Access and Benefit Sharing provisions of Biological Diversity Act .

2. Thematic Expert committees meetings:

Seven Thematic Expert Committees on various subjects were constituted to provide direction and to suggest recommendations in order to implement various provisions of the BD Act in Kerala. During the reporting period the following expert committee meetings were held:

1. ABS Expert Committee meeting on legal issues for implementation of ABS in State and IPR issues and also to discuss and prepare comments on revised Guidelines on ABS prepared by MoEF&CC was held on 15.05.2019 at Govt. Guest House, Thycaud.
2. Expert committee meeting held on 15.05.2019 at Govt. Guest House, Thycaud for discussing the following: (1) Developing state list of species to be restricted for commercial utilization Methodology and enforcement mechanism, (2) Methodology for developing database of traded bioresources, (3) Identification of Biodiversity rich sites & (4) Code of conduct of Biodiversity to be followed by line departments
3. A Consultative workshop on Agrobiodiversity was held on June 5th. The workshop inaugurated by Hon'ble Minister for Agriculture Shri V. S. Sunil Kumar and served to develop methodology and criteria for identification of custodian farmers, and nature of support including financial, technical or policy required for strengthening custodian farmers.



Consultative workshop on Agrobiodiversity

4. Expert committee meeting was held on 14.10.2019 regarding applications for access to

bioresources received from non Indian citizen in Form I through NBA, and Kerala Biological Diversity Rule 2008 Amendment.

5. Technical Sanction committee meeting for Red data book of Threatened species of Kerala was held on 03/01/2020 to scrutinize the projects received and to provide suitable recommendations
6. Technical sanction committee for Conservation of Sacred Groves of Kerala on 03/01/2020 to scrutinize the projects received and to provide suitable recommendations.
7. Expert committee meeting to provide suitable recommendations to the projects sanctioned through RKI was held on 12/02/2020
8. The State level Thematic expert committee meetings funded by National Biodiversity Authority was held on February 17th at Govt Guest House, Trivandrum. The meet was inaugurated by Dr.Usha Titus IAS, Principal Secretary, Department of Environment, Government of Kerala. Dr. Usha Titus explained about the key functions of the Thematic committee and the important role they have in guiding the Board in various issues. The discussions were held in five groups and the key topics discussed included
 - » Management Plan for Asramom Biodiversity Heritage Site and Criteria for identification of Locally important Biodiversity Heritage sites
 - » Guidelines for identification of Custodian framers and Methodology for Agrobiodiversity mapping
 - » Methodology to be adopted for PBR updation
 - » Riparian Biodiversity rejuvenation
 - » Guidelines for levy of collection fees by BMC and Guidelines for inclusion of green cess in compensatory afforestation plans

The Chair of the individual committees presented the key points in the prescribed format. The meeting was concluded by Mr. KV Govindan, Board Member who responded to the major recommendation presented by the committees and the way forward for conservation of biodiversity.



Consultative Workshop for Developing Standardized Protocol for Biodiversity Survey' held on November 21st & 22nd, 2019 at Sasthrabhavan, TVM



Consultative Workshop- Expert Committee Meeting held at Govt. Guest House, Thycaud, Thiruvananthapuram on 17/02/2020



7. Extension and Training

Major activities:

- International Day for Biological Diversity 2019
- World Environment Day 2019
- Wildlife Week Celebration 2019
- National Bird Day 2020
- Awareness Programmes
- Biodiversity Exhibitions
- Biodiversity Museum
- Biodiversity Awards 2018
- Biodiversity Club
- Children's Biodiversity Congress

7.1. Notable commemorative days observed

1. International Day for Biological Diversity 2019

Kerala State Biodiversity Board with support of National Biodiversity Authority celebrated International Biological Diversity Day 2019 with the focal theme “Our Biodiversity, Our Food, Our Health” in a befitting manner both at the District level and State level involving Custodian farmers, Biodiversity Management Committees, Technical Support Groups, Youth and Children.

Key highlights

- ✓ A Day with Local Genome Savors - District level
- ✓ Custodian farmers and their role in Biodiversity conservation”- Consultative workshop at State level
- ✓ Green Images 2019- Photography contest

Conservation and greater use of local varieties, organic farming and revival of agro ecosystems will be most effective in ensuring integrated food security at the local level. This can be achieved only if the message is communicated to the younger generation. Hence the district level programs focused on this key aspect. In all the 14 districts of Kerala an innovative camp A DAY WITH LOCAL GENOME SAVIORS a fun learning experience for youth and children to introduce them to the link between diverse food basket and health was conducted. Custodian farmers maintaining diversity of Agricultural crops under different thematic areas as Spice, Cereals, Fruit crops etc were selected in each district and about 25 students from each district, in the age group of 10-18 were given hands on experience of farming.

The camp included interactive sessions wherein they were familiarized with the concept of Agrobiodiversity, importance of maintaining diversity in fields, eg. community seed bank and were exposed to hands on training on Mushroom cultivation, composting, bee keeping and identification of traditionally cultivated and wild relatives of crops, etc. They were also introduced to various native and indigenous breeds and varieties, their nutritional value and medicinal value. The participants also learnt of the necessity of maintaining diversity of food basket by preparing and consuming local and nutritious traditional food items.

At the state level a photography contest was conducted with focal theme

- Our Biodiversity, Our Food, Our Health
- Agriculture Biodiversity of Kerala

More than 100 entries were received. The concluding session of the program was conducted at State level on June 5th and included a consultative workshop on “Custodian farmers and their role in Biodiversity conservation”. The workshop aims to identify the Custodian farmers of Kerala, documenting the best practices and developing a road map for conserving the Agrobiodiversity of Kerala.

International Day for Biological Diversity Celebration- Snapshots





രജവരവയ്യ നിരംഗങ്ങൾ

കേരള ബഹുതല B.Sc. Forum
 കേരള ബഹുതല B.Sc. Forum
 കേരള ബഹുതല B.Sc. Forum



**വിത്തിന്റെ കാവലാളിനൊപ്പം
 ജൈവ വൈവിധ്യ ദിനാചരണം**

കേരള ബഹുതല B.Sc. Forum
 കേരള ബഹുതല B.Sc. Forum



ആരംഭിച്ചതിനു വിദ്യാർത്ഥികൾ

കേരള ബഹുതല B.Sc. Forum
 കേരള ബഹുതല B.Sc. Forum

Pre-schools await grassroots change

കേരള ബഹുതല B.Sc. Forum
 കേരള ബഹുതല B.Sc. Forum

ജൈവവൈവിധ്യ ദിനം ആചരിച്ചു

കേരള ബഹുതല B.Sc. Forum
 കേരള ബഹുതല B.Sc. Forum

Farming lessons for life from Gangadharan's farm



Students of Mar Thoma Girls Higher Secondary School at O R Gangadharan's farm as part of World biodiversity day celebration

EXPRESS NEWS SERVICE @vivaar
 AS part of observing World Biodiversity Day, over 20 students of Mar Thoma Girls Higher Secondary School paid a visit to the farming lands of veteran farmer O R Gangadharan on Wednesday.
 While some eagerly inquired about the kind of crops being cultivated in Gangadharan's land, some were surprised at the kind of varieties available under a single crop.
 "Some students were aware of the different kinds of plants that could be cultivated, while some weren't. Most of them know about yam that we buy from vegetable shops, but had never seen the source it came from," shared Sharmila V, District coordinator of Kerala Biodiversity Board, who led the visit.
 Along with inputs about vegetable farming and paddy fields, students were also introduced to poultry farming and aquaculture. "They were also introduced to various kinds of plants, its local names and medicinal values," added Sharmila.
 Although some students are active members of various nature clubs in school, it was a unique experience for all. Gangadharan also shared his life experience with students.

A digital amateur photography contest ‘Green Images 2019’ was organized for two categories; (1) age group 10 years to 18 years (2) age group 18 years and above, with the themes “Our Biodiversity, Our Food, Our Health” and “Agriculture Biodiversity of Kerala”. The contest received enormous response from amateur photographers including children and was given wide publicity through social media networks. ‘Green Images 2019’ showcased mainly on the Agrobiodiversity of Kerala.



Inauguration of the International day for Biological Diversity 2019



The prize distributions for photography contest winners by Hon'ble Minister for Agriculture, Adv.V. S. Sunil Kumar.



Release of KSBS 2019 report

The State level programme of International day for Biological Diversity 2019 was celebrated on June 5th 2019 at PWD Rest House Auditorium, Thycaud, Thiruvanthapuram. Minister for Agriculture, Adv.V. S. Sunil Kumar inaugurated the function. The Introductory Speech was delivered by Dr.S.C.Joshi IFS (Retd.), Chairman, Kerala State Biodiversity Board.

This was followed by a State level consultative workshop on the theme “Custodian farmers and their role in Agrobiodiversity conservation”, which was attended by 75 invitees of Scientific community,

Agricultural Genome saviours and convenors of selected Biodiversity Management Committees

2. World Environment Day 2019

Hon'ble Chief Minister of Kerala Shri. Pinarayi Vijayan inaugurated the State-level World Environment Day celebrations at a function held at Vanasree Auditorium at the Forest department headquarters on June 5th at 3 pm.



The celebrations were organized jointly by Kerala State Biodiversity Board, Kerala Forest Department and Department of Environment and Climate Change. For promoting biodiversity in the state 12 individuals/organisations were given the State Biodiversity Awards for the year 2018. Hon'ble Chief Minister distributed the awards during this function and also declared the first Biodiversity Heritage Site in the state, Asramam, Kollam.



Kerala State Biodiversity Award 2018

3. Wildlife Week Celebration 2019

Every year wildlife week is celebrated in the month of October from October 1st to October 7th in India. The main motto behind celebration is to preserve the wildlife in India and make common people aware of it. As part of the Biodiversity awareness activities of Biodiversity Museum, a quiz competition was conducted to school students in connection with the celebration of Wild life week. Shri. Sivakumar A K, Senior Education Officer of WWF-India led the quiz competition.



Quiz Programme

4. National Bird Day 2020

The 'National Bird Day' is celebrated to give emphasis on the critical issues for the protection and survival of birds. As part of the Biodiversity awareness activities of Biodiversity Museum, one day programme with 'gifted children' from different schools of Thiruvananthapuram was conducted on January 5th. This included field visit to a bird area in Thiruvananthapuram, the Punchakari part of the Vellayani Lake. Fifty students along with Deputy Director of Education Thiruvananthapuram, Teachers, Administrative officer KSBB, and staffs of KSBB participated in the programme.



7.2. Awareness Programmes

1. Training Programme to Range Forest Officers

All territorial and wild range forest officers in the State are designated as authorized officers to enforce regulatory provisions of the Biological Diversity Act 2002 as per the Government order G.O(Rt). No.19/2019/F&WLD, dated 16.01.2019. In this context training programme to Forest Officers on Biodiversity Act, Rules and various provisions under this act and its field level implementation were conducted at State Forest Training Institute, at Arippa Kollam on 5/8/2019 and at Walayar on 9/8/2019. In both the trainings, an overview on the introduction of biodiversity was given by Chairman KSBB,

Dr.S.C.Joshi IFS (Retd). Training was conducted in two sessions. A total of 110 forest officers attended these trainings.



Training programme to Range Forest Officers

Sl.No	Name of the session	Resource persons who handled the session
1	Implementation of Biodiversity Act, Rules and Role of Range Forest Officers	<ol style="list-style-type: none"> 1. Shri. Achelender Reddy IFS, Director, Centre for Innovations in Public Systems, Hyderabad 2. Shri. Ravi Kant Upadhyay IFS, Former Principal Chief Conservator of Forests & Head of forest force. Tamil Nadu
2	Organizational structure of Biodiversity Conservation in the country including State; issues negatively affecting Biodiversity Conservation and constraints in effectively using the institutional structure like working group, BMC and PBR	<p>Dr. Jacob Joseph Assistant professor & Director in charge, Centre for law and Agriculture, NUALS</p>

2. Training Programme to Munsiff Magistrate trainees

KSBB conducted one day training programme about the importance of Biodiversity conservation and the Biodiversity Act and Rules to Munsiff Magistrate trainees at Judicial Academy, Ernakulum

on 22/08/2019. Dr.S.C.Joshi IFS (Retd), Chairman KSBB gave an introductory presentation on the “Origin and importance of Biological Diversity Act 2002”.

The presentation on ‘Access and Benefit Sharing – Mechanism in Biodiversity Act & Rule’ was delivered by Dr. M.K Ramesh, Professor of Law, National Law School of India University, Bangalore. Session on ‘Introduction to Biodiversity Act 2002 & Rule 2004 and possible violations in Kerala, Nature of Legal Cases in India under Biological Diversity Act 2002 & Rules 2004’ was handled by Dr. Jacob Joseph, Assistant Professor and Director in charge, Centre for law and Agriculture, NUALS. Forty Munsiff Magistrates trainees attended the training.



3. Training Programme to Police officers

KSBB conducted one day training programme on 18th of February 2020 to Police Officers on Biodiversity Act & Rules, Climate change & Biodiversity, Forest laws & Biodiversity Conservation and Threats to Medicinal plants, at Kerala Police Training College, Thiruvananthapuram. Dr. B. Sandhya IPS, Additional Director General of Kerala Police & Director, Kerala Police Academy inaugurated the training programme. An introductory talk on Biodiversity Act & Rules was given by Dr. V Balakrishnan, Member Secretary, KSBB. Shri. Pramod G Krishnan IFS, Chief Conservator of Forests (WP & R), Kerala Forest & Wild life Department delivered the presentation on “Forest laws and Biodiversity Conservation”. Prof. E Kunhikrishnan, Professor (Retd). Department of Zoology, University College, Thiruvananthapuram, delivered presentation on Climate change & Biodiversity. Threats to Medicinal plants were detailed by Dr. S Rajashekharan, Senior Project Consultant, KSBB. Forty station house police officers in the border areas of Kerala attended the training.



4. Harithavani

Biodiversity Awareness programme of Kerala State Biodiversity Board ‘Harithavani’ is broadcasted through All India Radio on every Tuesdays and aim to create awareness at grass root level

5. Training Programme to District Coordinators, KSBB

Training to district coordinators about the different activities of the board, their duties, their role and responsibilities were conducted at Conference Hall of PWD Rest House, Trivandrum on 31/08/2019. Total of 35 members including the staff from headquarters participated in the training



7.3. Biodiversity Exhibitions

1. Provectus Plantae- 2019

KSBB participated in the exhibition held in connection with “Provectus Plantae 2019”, an International Conference on Exploring the Scope of Plant Genetic Resources organised by Department of Botany, University of Kerala at the University Campus, Kariyavattom, Thiruvananthapuram, from May 22nd to 24th, 2019. Almost 2000 visitors from different parts of India visited the exhibition. Brochures and books were distributed for creating awareness about biodiversity conservation

2. Exhibition at Venganoor Higher Secondary School, Thiruvananthapuram

KSBB actively participated in the exhibition held at Venganoor Higher Secondary School, Thiruvananthapuram on November 2019 with display boards and panels showcasing importance of Biodiversity and its conservation. Nearly 3500 students and teachers from different schools of Thiruvananthapuram visited the exhibition. Brochures and books were distributed for creating awareness about biodiversity conservation

3. Vasantholsavam



KSBB stall at Vasantholsavam

KSBB participated in the exhibition held in connection with Vasantholsavam, organized at

Kanakakkunnu Palace, Thiruvananthapuram under the auspices of Kerala Tourism from December 21st, 2019 to January 5th, 2020. Vasantholsavam was inaugurated by the Hon'ble Chief Minister Shri. Pinarayi Vijayan on 21st December 2019. The exhibition was successful in enhancing public awareness of the importance of conserving biodiversity, of the threats and factors leading to biodiversity loss and the multiple aspects of biodiversity contributing to human well-being. The exhibition was widely appreciated by the 50,000 visitors including tourist, local residents, students and people from all sectors. Brochures and books were distributed for creating awareness about biodiversity conservation.

4. National Children's Science Congress

KSBB participated in the exhibition held in connection with 27th National Children's Science Congress (NCSC) held at Mar Ivanios Vidyanagar, Nalanchira, Thiruvananthapuram from December 27th to 31st ' 2019. Hon'ble Chief Minister Shri. Pinarayi Vijayan inaugurated NCSC at Girideepam Convention Centre, Nalanchira on 27th December 2019. The exhibition took the audience through the rich biodiversity of Kerala, critically endangered flora and fauna, domesticated biodiversity, traditional varieties and breeds and conservation measures adopted. Brochures and books were distributed for creating awareness about biodiversity conservation. Almost 5000 people including students and teachers from across the country visited the exhibition.



KSBB stall at National Children's Science Congress

5. Vaiga - 2020

VAIGA was organised by Government of Kerala from 4th to 7th January, 2020 at Thekkinkad Maidanam, Thrissur, Kerala. The fourth edition of the VAIGA -2020 meant for sustainable development through Agripreneurship was inaugurated by Governor, Shri. Arif Mohammed Khan. Panels related to Agrobiodiversity were displayed in the exhibition and this attracted 20,000 visitors including farmers from all over the state. Brochures and books were distributed for creating awareness about biodiversity conservation



KSBB stall at VAIGA -2020

6. Kerala Science Congress 2020 Exhibition held at Palakkad.

National Exhibition was conducted from 24th to 27th January 2020 in connection with the 32nd Kerala Science Congress at Yuvakshetra Institute of Management Studies at Mundoor, Palaghat.



KSBB stall at Kerala Science Congress

KSBB actively took part in the exhibition. Almost 5000 people visited the stall and it was a grand success due to the whole hearted co-operation and support of BMC's and all other well wishers. Brochures and books were distributed for creating awareness about biodiversity conservation.

7.4. Biodiversity Museum

In order to create awareness among the people on the importance of Biodiversity and Biodiversity conservation, India's first Biodiversity museum, the Kerala Biodiversity museum, has been working at the heritage building in Vallakkadavu, Thiruvananthapuram since June 2018.

The Museum which is functioning with innovative technologies like Science on Sphere (SOS), Interactive kiosks, LCD displays and 3D theatre attracts large number of people including students and teachers. The Museum provides holistic knowledge on biodiversity. Special concessions were given to disabled students and groups of students visiting the Museum. The exhibits are being updated regularly and several innovative programmes were conducted to attract more visitors.



1. Aquarium of native fish in the Museum:

Fresh water fishes are one of the most diverse groups of vertebrates and are threatened and many species are vulnerable to extinction. There are many factors causing threat to the freshwater biodiversity which includes water pollution, loss of habitat, unsustainable fishing and introduction of exotic species. In order to create awareness about inland fish biodiversity of Kerala, aquariums were set up at Biodiversity Museum. The new addition include 8 species of native fishes of Kerala. In addition to it, exotic species of fishes which are permitted for cultivation and exotic species which are banned for cultivation were kept in different aquarium. Beside these, two more aquariums with ornamental fishes were also set up in the museum. Aim of this venture is to draw attention of public to develop strategies about fresh water fish conservation and sustainable fisheries.



7.5. Visit of special guests to Kerala Biodiversity Museum

During this period special guests from different parts of India visited the Kerala Biodiversity Museum.

The following are the officials who visited the museum :-

1. IFS officials including Director of Centre for innovations in public systems, Hyderabad visited on 01-01-2019
2. Officials from Nagaland State Biodiversity Board including Member Secretary visited on 06-02-2019
3. Officials from Haryana State Biodiversity Board including Chairman visited on 30-04-2019
4. Officials from Ministry of Forest and Environment Nepal visited on 09-11-2019
5. Officials from NBA and NGT including Chairperson and Member Secretary of NBA visited on 05-04-2020





7.6. Biodiversity Awards 2018

KSBB gives awards annually to individuals and organizations for their meticulous work in the field of Biodiversity conservation. Biodiversity Awards 2018 were distributed to the winners on 5th June 2019 under 10 categories, which include (1) Best Biodiversity Management Committee, (2) Biodiversity/ Environment Conservation, (3) Custodian of Traditional Varieties, (4) Custodian of Traditional Farm Animal breeds, (5) Biodiversity Conservation – School, (6) Biodiversity Conservation – College, (7) Biodiversity Conservation Institution, (8) Biodiversity Conservation – NGO, (9) Media Person - Print (Malayalam) and (10) Electronic Media – Malayalam. Award consists of Plaque, certificate and cash award.

The recipients of the awards for 2018;

- Bio-diversity Management Committees of Veeyapuram gram panchayat and Maranchery gram panchayat were adjudged the best. They shared a cash prize of Rs.1 lakh, a citation and plaque.
- C V Vidyadharan, of Cherthala, and P V Divakaran, of Kasaragod, were adjudged, Bio-diversity Conservators. They shared a cash prize of Rs 50,000, a citation and a plaque.
- P J Manuel award for Custodian of Traditional Varieties. Reshmi Edathanal, of Kottayam, won award for Custodian of Traditional Farm Animal breeds. Both Manuel and Reshmi received a cash prize of Rs 50,000, a citation and plaque each.
- Government LPS Malappacheri, in Kasaragod, was adjudged the best Biodiversity Conservation – School. In the college category, College of Forestry, Thrissur, bagged the award. The institutions received a cash prize of Rs 25,000, a citation and plaque each.
- The Museum-Zoo was adjudged the best government institution to promote Biodiversity Conservation.
- Sajith Parameshwaran and G S Unnikrishnan Nair won media awards. They received cash prize of Rs 25,000, a citation and plaque.
- STM Document Engineering Private Ltd, Thiruvananthapuram, received a special jury mention.

7.7. Biodiversity Club

Biodiversity Clubs play a great role in furthering biodiversity education outside the class room. 150 Biodiversity clubs were newly registered during the year. Altogether there are 1715 registered biodiversity clubs in Kerala. A review meeting (virtual classroom) was conducted on 19.11.2019 with club co-ordinators and students of the school which received financial assistance from KSBB for Biodiversity conservation extension activities.

7.8. Children's Biodiversity Congress

Kerala State Biodiversity Board is organizing Children Biodiversity Congress (CBC) annually to create

awareness among the school children in the State. The main theme of the 12th CBC was “Climate change and Agrobiodiversity”. KSBB conducted junior and senior category online competitions for Photography, Essay writing, Painting competition at state level and Project presentation competition at district and State level. The prizes were awarded at a State level function held on 3rd February 2020 at Biodiversity Museum.

12th CBC was inaugurated by Hon’ble Mayor of Thiruvananthapuram Cooperation, Mr. K Sreekumar. The programme was presided over by Dr. Usha Titus, Principal Secretary, Environment Department, Kerala and Additional Charge of Chairman, KSBB. Dr. B. Sandhya IPS, ADGP, Dr. Jeewan Babu IAS, Director of General Education and Kerala State Biodiversity Board Members felicitated on the occasion.



This was followed by the programme 'Meet the Scientist' in which, Padma Shri. Dr. MC. Dattan, Scientific Advisor to CM, Dr. A. Bijukumar, Head, Dept of Aquatic Biology, University and Dr. Smitha K.P, Assistant Professor, Department of Agricultural Extension, College of Agriculture, Vellayani, Thiruvananthapuram interacted with the students to increase their scientific temper.



In the next programme of 'Students Seminar', the interactive session of Balasasthra Congress team winners of KSCSTE with Gifted Children was conducted. Various students presented their projects and involved in active discussions regarding these projects. The valedictory function was inaugurated

by Hon'ble Minister of Education, Dr. C Ravindra nath and the prizes were distributed.



7.9. Volunteers for biodiversity conservation activities

KSBB has selected 58 Volunteers from various districts who are willing to involve in the various projects and activities of the Board. These Volunteers will be effectively utilized while implementing the future activities of KSBB.

7.10. 'Biodiversity knowledge centre'

Biodiversity knowledge centre is the outcome of the joint venture of KSBB and Kerala State Library Council. Kerala State Library Council propose to start 'Biodiversity Knowledge Centre' in A+ and A grade libraries in the state for which they will provide space, and the centre will aim to create awareness about biodiversity at grass root level.



8. Expert committee representation and major meetings attended

8.1. Major meetings attended by Chairman

- International Conference for Climate Action at Heidelberg, Germany held on 22nd and 23rd May 2019 sponsored by German Federal Ministry for the Environment, Nature conservation Nuclear Safety, the state of Baden Wuttemberg and the City of Heidelberg.
- Consultation meeting in pursuance of the order passed by the Hon'ble NGT, Principal Bench, New Delhi in the matter of O.A.347 of 2016 at Parywaran Bhawan, New Delhi on 30.09.2020
- 4th National Consultation for the National Mission on Biodiversity and Human Well-Being held in MoEFF & CC, Parywaran Bhawan, New Delhi on 17.10.2019
- National outreach on significance of urban biodiversity on 14, 15 Nov 2019 at Wildlife Institute of India, Dehradun
- Participated in the Jaiva Karshikolsavam 2019 conducted by Organic Kerala Charitable Trust in Ernakulam on 04.04.202019
- Chief guest in the training programme on “Routable with CEOs on Biodiversity & Spice Sector” on 04.05.2019 at Kochi conducted by GIZ.
- Forest Officials training programme related to Biodiversity Act held on 05.08.2019 at Arippa and 09.08.2019 at Walayar
- Biodiversity Awareness programme held at Kerala Judicial Academy on 22.08.2019 at Ernakulam
- Chief guest in the inauguration of 1st community organic farm created by Social Health One Health Movement Trust and Organic Kerala Charitable Trust at Cheeni Hill farm Kanthalloor, Idukki on 1.11.2019

8.2. Major meetings attended by Member Secretary

- Attended 4th Asia-Pacific forum on Urban Resilience and Adaptation conducted by ICLEI at New Delhi on 16th and 17th April 2019
- Attended 1st regional consultation meeting of SBBs on Draft (Revised) guidelines on ABS held on 21st June 2019 at Chennai
- Attended cconsultation meeting in pursuance of the Order passed by the Hon'ble NGT, Principal Bench, New Delhi in the matter of O. A. 347 of 2016 at Parywaran Bhawan, New Delhi on 30.09.2019 by NBA
- Attended brain storming Workshop on Preparing/Updating State Biodiversity Strategy and Action Plan and Developing a Resource Mobilisation Strategy on November 4-5, 2019, at Chennai
- Attended 14th Annual meeting of SBBs held at NBA, Chennai on 27th and 28th Nov.2019
- Attended workshop for TCP Agrobiodiversity project conducted by FAO at New Delhi on 16th

Dec.2019

- Attended workshop on "Data architecture for National Frame work for e-PBRs" held on 9-10th January, 2020 held in NBA, Chennai.
- Delivered a talk on one day workshop conducted by KSCSTE Malabar Botanical Garden at Kozhikode on 27.05.219
- Attended workshop on 'Doubling income by improving productivity Sustainably' conducted by Kerala Development Innovation Strategic Council (K-DISC) on 15th Sept 2019 at MSSRF, Wayanad
- Participated in FAO meeting conducted at KILA on 23rd Sept 2019
- Participated in declaration of ISO Quality of Pilicode Panchayat by Hon'ble Minister for Revenue on 3.11.2019
- Delivered a talk about biodiversity conservation during Sciences for the teachers programme conducted by UGC Resource Development Centre, Kannur University on 2.12.2019

9. Publications

1. Dr. SC Joshi, Dr. V Balakrishnan, Dr. Preetha N (Eds): Biodiversity for Climate resilience ISBN 978-81- 934231-2-7
2. Dr. SC Joshi, Dr. V Balakrishnan, Dr. Preetha N (Eds): A concise report on Biodiversity loss due to 2018 flood in Kerala
3. Preetha N (2020) Healthy Plants for a Healthy Planet, Mathrubhumi Year Book Plus
4. Training materials on Biodiversity Act & Rules for police officers
5. Training materials on Biodiversity Act & Rules for munsiff magistrates trainees
6. Training materials on Biodiversity Act & Rules for forest officers
7. Training materials to district coordinators of KSBB

10. Details of books, sold during year (2019-20):

Sl: No	Name of KSBB Publications	Total No.of books sold
1	Common Trees of Kerala	59
2	Keralathile Oushada Sasya Vaividhyam	66
3	Kerala Theerathe Kadaljeevikal	42
4	Keralathile Chitrashalabangal	50
5	Jaiva Krishi Oru Prayogika Paadam	178
6	Invasive Plants of Kerala	44
7	Keralathile ShudhajalaMatsyangal	41
8	Common Amphibians of Kerala	33
9	Mushrooms of Kerala	35
10	Mangroves & Mangrove Associates of Kerala	57
11	Marine Gastropods of Kerala	234
12	Prakrithi Geetangal	32
13	Paristhiti Vidjnhanavum Jaivavaividhya Naattarivum	33
14	Feathers of Vellayani	87
15	Biodiversity Richness of Kerala	34
16	Snakes of Kerala	98

17	Caecilian Diversity of Kerala	42
18	Vrikshayurveda	45
19	Flying Colours of Vembanad	40

11. Details of Books, Brochures, Booklets, distributed during 2019 April to 2020 March:

Sl No	Item	Category	Language	Total Distributed
01	Jaivavaividhya Act 2002 & Rules 2004 (NBA)	Book	Malayalam	1560
02	Kerala State Biological Diversity Rules 2008	Book	English	1500
03	Jaivavaividhya Mukyadharayilekku	Booklet	Malayalam	840
04	Keralathile Naadan Pasukal	Brochure	Malayalam	150
05	Keralathile Naadan Aadinangal	Brochure	Malayalam	150
06	Keralathile Naadan Valarthu Pakshikal	Brochure	Malayalam	150
07	Island Biodiversity	Brochure	English	150
08	Water Birds	Brochure	English	150
09	ABS Pravarthana Reethi	Book	Malayalam	200
10	Keralathile Nheer Pakshikal	Brochure	Malayalam	150
11	Marotti	Booklet	Malayalam	170
12	Oushada Sasya Swabhavika Uravida Pariposhnam	Book	Malayalam	50
13	Jaivavaividya Club Manual	Book	Malayalam	2278
14	Keralathile Sugandha, Oushada Nellinangal	Brochure	Malayalam	200
15	Bhoomiyude Pachakudakal	Brochure	Malayalam	200
16	Kerala Samsthana Jaiva Vaividhya Board	Brochure	Malayalam	200
17	Kaavukal	Brochure	Malayalam	200
18	Thavalakal Manmarayumbol	Brochure	Malayalam	200
19	Thumbikal Prakrithiyude Vismayangal	Brochure	Malayalam	200
20	Nhamayude Nheerthadangal	Brochure	Malayalam	200
21	Keralathile Vanangal	Brochure	Malayalam	200
22	Kadalukal Malinamakumbol	Brochure	Malayalam	200
23	Kandalkaadukal	Brochure	Malayalam	200
24	Vithinte Avakasikal	Brochure	Malayalam	200
25	Poultry Breeds of Kerala	Brochure	English	150
26	Aromatic Medicinal Rice Varieties of Kerala	Brochure	English	150
27	Native Goat Breeds of Kerala	Brochure	English	150
28	Native Cattle Breeds of Kerala	Brochure	English	150
29	BMC Kaipustakam	Book	Malayalam	425
30	Floral Diversity of Armed Police Campus in Kerala	Book	English	20
31	Oothayilakkam	Brochure	Malayalam	350
32	Oothayilakkam	Poster	Malayalam	2800

33	BMC Anubavapadangal, Viketrikarnam, Samreksnam	Book	Malayalam	1210
34	KSBB Pravarthana Samvidhanam	Brochure	Malayalam	770
35	Kerala Biodiversity Museum	Booklet	English	1000

12. Implementation of right to information act Officers In- charge

Name & Designation of Officer (s)	Designated post
Dr. S.C.Joshi IFS (Retd.) Chairman (From 18.09.2017-continuing)	Appellate Authority
Dr. V. Balakrishnan Member Secretary	State Public Information Officer
Dr. Sudheesh. N Scientific Officer	State Assistant Public Information Officer

SUO MOTO DISCLOSURE UNDER SECTION 4(1) (b)

Reporting Year: 2019-20

Sl. No.	Department	No. of Public Authorities	No. of Public Authorities which published the 17 manuals under section 4(1) (b)	No. of public authorities which updated the 17 manuals during the year	No. of public authorities which displayed the 17 manuals online
(1)	(2)	(3)	(4)	(5)	(6)
	Kerala State Biodiversity Board	NIL	NIL	NIL	NIL

DESIGNATION OF PUBLIC INFORMATION OFFICERS/ APPELLATE AUTHORITIES

Reporting Year: 2019-20

Sl. No.	Department	No. of Public Authorities	No. of Public Information Officers designated	No. of Assistant Public Information officers Designated	No. of Appellate Authorities Designated
(1)	(2)	(3)	(4)	(5)	(6)
	Kerala State Biodiversity Board	-	1	1	1

DISPOSAL OF INFORMATION REQUESTS BY PUBLIC INFORMATION OFFICERS

Reporting Year: 2019-20

Name of the Department	No. of requests pending at end of last year	No. of requests received during the year	Total No. of requests	No. of requests disposed	No. of requests rejected	No. of requests deemed to be refused under section 7(2)	% of cases access to information denied
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Kerala State Biodiversity Board	Nil	11	11	10	NIL	NIL	0

INFORMATION REQUESTS REJECTED BY PUBLIC INFORMATION OFFICERS

Reporting Year: 2019-20

Name of the Department	Total no. of requests rejected	No. of requests rejected under section 8	No. of requests rejected under section 9	No. of requests rejected under section 11	No. of requests rejected under section 24	No. of requests rejected other sections
(1)	(2)	(3)	(4)	(5)	(6)	(7)
KSBB	NIL	NIL	NIL	NIL	NIL	NIL

DISPOSAL OF FIRST APPEALS BY DESIGNATED APPELLATE AUTHORITIES

Name of the Department	No. of first appeals pending with appellate authorities on 1.4.2019	No. of first appeals preferred during the year	Total no. of first appeals with appellate authorities (2+3)	No. of first appeals disposed	No. of first appeals rejected	% of first appeals rejected	No. of first appeals pending for more than 45 days
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Kerala State Biodiversity Board	Nil	1	1	1	NIL	0	NIL

PENALTIES IMPOSED & COLLECTED

Reporting Year: 2019-20

Name of department	Penalties imposed in previous year pending for collection	Details of penalties imposed by information commission under section 20 (1)	Total	Details of penalties collected
(1)	(2)	(3)	(4)	(5)
Kerala State Biodiversity Board	NIL	NIL	NIL	NIL

DISCIPLINARY ACTION TAKEN AGAINST OFFICERS IN RESPECT OF ADMINISTRATION OF RTI ACT

Reporting Year: 2019-20

Name of department	Details of disciplinary action recommended by information commission under section 20 (2)	Details of disciplinary action taken based on recommendation of information commission	Other disciplinary actions taken (other than those recommended by information commission)
(1)	(2)	(3)	(4)
Kerala State Biodiversity Board	NIL	NIL	NIL

SUMMARY COSTS, FEES & CHARGES COLLECTED BY PUBLIC AUTHORITIES

REPORTING YEAR: 2019-20

Name of the Department	Cost collected section 4 (4)	Fee collected section 6 (1)	Fee collected section 7 (1)	Fees Collected Section 7 (6)	Other charges collected (specify)	Total collection
(1)	(2)	(3)	(4)	(5)	(6)	(7)
KSBB	NIL	110	NIL	NIL	NIL	110

Impact of floods/ landslides on Biodiversity – List of Projects

SL. No.	Name of the Institution	Subject
1	Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Karimancode P.O., Palode, Thiruvananthapuram	Impact of Landslides on the Forest Ecosystem in Wayanad district, Kerala with special reference to floristic wealth
2	Centre for Environment and Development Thozhuvancode, Vattiyoorkavu P.O. Thiruvananthapuram,	Assessment of Impact of floods/landslides on Biodiversity with special emphasis on - Riparian vegetation - Pamba, Periyar, Chalakudy, Bharathapuzha
3	Head of the Department of Biotechnology, Cochin University of Science and Technology, Cochin	Riverine biodiversity monitoring with reference to Mangroves in comparison with pre-flood data
4	International Research and Training Centre for Below Sea level Farming (IRTCBSF), Department of Agriculture & Farmers Welfare, Near Thottappally spillways, Alappuzha	Impact of Flood and Deluge on the Hydrobiology and Biodiversity endowments of Kuttanad Ecosystem, Kerala
5	Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Karimancode P.O., Palode, Thiruvananthapuram	Biodiversity Assessment of Manimala River
6	Kerala Agricultural University, Vellanikara, Thrissur	Impact of Floods / Landslides on Riverine Biodiversity - Chalakudy river basin
7	Kerala Forest Research Institute, Peechi, Thrissur	Impact of the flood on soil biota in Pamba, Periyar, Bharathapuzha and Chalakkudy Rivers in Kerala
8	Department of Botany, University of Kerala, Kariyattom, Thiruvananthapuram	Studies on Invasive Alien Plant Species in the flood affected areas of Karthikapally Taluk, Alappuzha District
9	Director of Research, Kerala University of Fisheries and Ocean Studies (KUFOS), Kochi	Impact of Kerala Floods / Landslides on single location endemic fish species
10	KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences, Post Box No. 1, G.A College PO, Kozhikode	Assessment of Plant diversity including Aquatic flora Riparian vegetation etc in the flood / Landslides affected areas of Chaliyar, Korapuzha and Kuttuyadi rivers
11	NSS College, Pandalam, Pathanamthitta	Estimation of Population density and diversity of major soil animal groups in relation to recent flood affected areas near Pampa River
12	NSS College, Pandalam, Pathanamthitta	Impact of Flood on the Micro and Macro Floral Biodiversity of Pandalam & Chengannur with Special Reference to Pandanad: A Post and Pre-Flood Analysis, Kerala

13	Head of the Department of Botany, University of Kerala, Kariyavattom, Thiruvananthapuram	Survey and analysis on Ethnobotanical resources present status and livelihood of tribal communities in flood affected areas of Vazhachal, ThrissurDist
14	Department of Botany, University of Kerala, Kariyavattom, Thiruvananthapuram	Inventory and evaluation of spread ecology of the reverine flora of Achankovilriverbasin, Kerala
15	Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Karimancode P.O., Palode, Thiruvananthapuram	Survey and Inventory of Soil Microbial Biota in the Post Flood Scenario
16	Department of Zoology, University of Kerala, Kariyavattom	Assessment of Native And Exotic Ichthyodiversity Status Of River Bharathapuzha, Periyar And Pamba
17	Govt. Victoria College, Palakkad	Post flood habitat modification and biodiversity loss in selected forest ranges in Palakkad District
18	WWF-India, Kerala State Office, Vanchiyoor, Thiruvananthapuram	Assessment of Biodiversity Loss for Selected Faunal Groups
19	Cochin University of Science and Technology, Cochin	Metagenomic analysis of soil microbia; diversity in post flood mangroves
20	Centre for Management Development, Thycaud, Thiruvananthapuram,	Impact of Floods/landslide on Biodiversity and Evaluating the Change in the Ecosystem/ Biodiversity of the State
21	Sanatana Dharma College, Sanathanapuram P.O., Alappuzha	Inventory and evaluation of spread ecology of the Mangrove flora in the islands of Alappuzha District
22	Integrated Rural Technology Centre (IRTC), Mundur, Palakkad	Assessing Impact of Floods/ Landslides on Biodiversity, Bioresources, and Tribal Livelihood in Attappady
23	Nirmala College, Muvattupuzha	Riverine Biodiversity Monitoring - Impact of Floods/ Landslides on Biodiversity
24	Community Agrobiodiversity Centre, M S Swaminathan Research Foundation, puthoorvayal p o, Meeppadi, Wayanad	Assessment of agrobiodiversity loss due to flood in Wayanad and Developing Conservation Strategies
25	MES Asmabi College, Vemballur, Thrissur	Assessment of Impact of flood/landslide on Biodiversity and developing methodology for long-term monitoring and evaluation of changes in the ecosystem and biodiversity : A case study in the Athirapilly Panchayath
26	Govt. College Chittur, Palakkad	Assessment of Biodiversity loss along the flood and landslide hit areas of Attappady region, Palakkad district Using Geoinformatics
27	Centre for Management Development, Thycaud, Thiruvananthapuram	Impact of floods/landslides on Biodiversity in Pathanamthitta and tribal Livelihood in Idukki and Pathanamthitta
28	Victoria College, Palakkad	Assessment of Plant diversity loss along the flood and landslides hit areas of Nelliampathi Forest Range, Palakkad

Kerala State Biodiversity Board
Kowdiar Thiruvananthapuram Kerala
Statement of Affairs as at 31.03.2020

	Note	Current period 31-03-2020	Previous Period 31-03-2019
I Source of Funds			
1 Own Funds		29,88,729	1,25,34,407
Surplus	1	19,06,193	18,33,221
2 Current liabilities		10,82,536	1,07,01,185
Government Grant balances	2	-74,67,884	8,16,637
Funded Projects	3	70,99,803	81,66,287
Other current liabilities	4	14,50,617	17,18,261
II Application of Funds			
1 Long Term Assets		29,88,729	1,25,34,407
Fixed Assets		37,063	37,000
Tangible Assets	5	63	-
Long Terms Loans and Advances	6	37,000	37,000
Deposits		37,000	37,000
2 Current Assets		29,51,666	1,24,97,407
Cash and cash equivalents	7	25,02,025	1,24,38,766
Short-term loans and advances	8	4,49,641	58,641

Notes forming part of Statements of Account
Significant Accounting Policies

Auditor's Report
As per our Report of even date

For and on behalf of the Board

[Signature]
Chairman
Kerala State Biodiversity Board
Thiruvananthapuram

[Signature]
Member Secretary (i/c)
Member Secretary (i/c)
Kerala State Biodiversity Board
Thiruvananthapuram

[Signature]
Finance Officer

Thiruvananthapuram
01.12.2020

For JVS & ASSOCIATES
Chartered Accountants
FRN 0119798



R. VINOD KUMAR, FCA
M.NO. 217216
Partner

Kerala State Biodiversity Board
Kowdiar Thiruvananthapuram Kerala
Income and Expenditure Account for the year ended 31.03.2020

	Note	Current period 31-03-2020	Previous Period 31-03-2019
I Income		75,56,723	92,90,089
1 Grant from GoK		54,26,648	72,21,775
GoK 2406-02-110-59-31 (NP) Salary		13,70,560	14,85,000
GoK 2406-02-110-59-36 (NP) Non Salary		-	-
2 Funded Projects		-	-
3 Other Income	9	7,59,452	5,83,314
4 Nominal value of grant funded assets		63	-
5 Interest Received		-	-
II Expenditure			
Employee Expenses	10	74,83,751	86,01,883
Repairs and Maintenance, Upkeep	11	58,28,984	69,12,636
Utilities	12	1,13,173	1,03,875
Other Expenses	13	8,85,113	5,80,780
Finance Costs	14	7,77,067	10,02,323
Depreciation		1,541	1,210
Exceptional Items		-	-
Extraordinary Items	15	-1,22,127	1,059
III Surplus/ Deficit		72,972	6,88,206
IV Allocation		72,972	6,88,206
Transfer to Revenue Reserve		72,972	6,88,206

Notes forming part of Statements of Account
Significant Accounting Policies

Auditor's Report
As per our Report of even date

For and on behalf of the Board

[Signature]
Chairman
Kerala State Biodiversity Board
Thiruvananthapuram

[Signature]
Member Secretary (i/c)
Member Secretary (i/c)
Kerala State Biodiversity Board
Thiruvananthapuram

[Signature]
Finance Officer

Thiruvananthapuram
01.12.2020

For JVS & ASSOCIATES
Chartered Accountants
FRN 0119798



R. VINOD KUMAR, FCA
M.NO. 217216
Partner

Kerala State Biodiversity Board

Kowdiar Thiruvananthapuram Kerala

Annexures to Accounts for the year ended 31/03/2020

Annexure 2 - Grant Accounts

	As at		Receipt				Payment				As at	
	01-04-2019	31-03-2020	Grant Received	Interest	Refund IN	Trf IN	Utilised	Assets	Refund Out	Trf OUT	Trf I&E AC	31-03-2020
1	8,16,637	-	3,81,01,552	-	6,75,833	6,75,833	-3,31,17,891	-	-59,76,630	-	-67,97,208	-74,67,884
1	-10,63,202	-	3,08,10,000	-	6,75,833	6,75,833	-3,28,57,329	-	-59,76,630	-	-	-84,11,328
1	9,305	-	-	-	-	-	-	-	-	-	-	9,305
1	2,55,355	-	-	-	-	-	-	-	-	-	-	2,55,355
1	65,600	-	-	-	-	-	-	-	-	-	-	65,600
1	57,487	-	-	-	6,75,833	6,75,833	-3,28,57,329	-	-59,76,630	-	-	57,487
1	-14,78,697	-	-	-	-	-	-	-	-	-	-	-3,96,36,823
1	27,748	-	3,08,10,000	-	-	-	-	-	-	-	-	3,08,10,000
1	18,79,839	-	-	-	-	-	-2,60,562	-	-	-6,75,833	-	27,748
1	3,10,300	-	-	-	-	-	-	-	-	-	-	9,43,444
1	5,01,188	-	-	-	-	-	-	-	-	-	-	3,10,300
1	5,04,265	-	-	-	-	-	-	-	-	-	-	5,01,188
1	8,29,001	-	-	-	-	-	-2,15,562	-	-	-	-	5,04,265
1	3,61,258	-	-	-	-	-	-	-	-	-	-	6,13,439
1	-6,26,173	-	-	-	-	-	-	-	-6,75,833	-	-	3,61,258
1	-	-	-	-	-	-	-45,000	-	-	-	-	-13,02,006
1	-	-	59,20,992	-	-	-	-	-	-	-4,94,344	-	-45,000
1	-	-	59,20,992	-	-	-	-	-	-	-4,94,344	-	-
1	-	-	13,70,560	-	-	-	-	-	-	-	-	-13,70,560
1	-	-	13,70,560	-	-	-	-	-	-	-	-	-13,70,560



Kerala State Biodiversity Board

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Annexures to Accounts for the year ended 31/03/2020

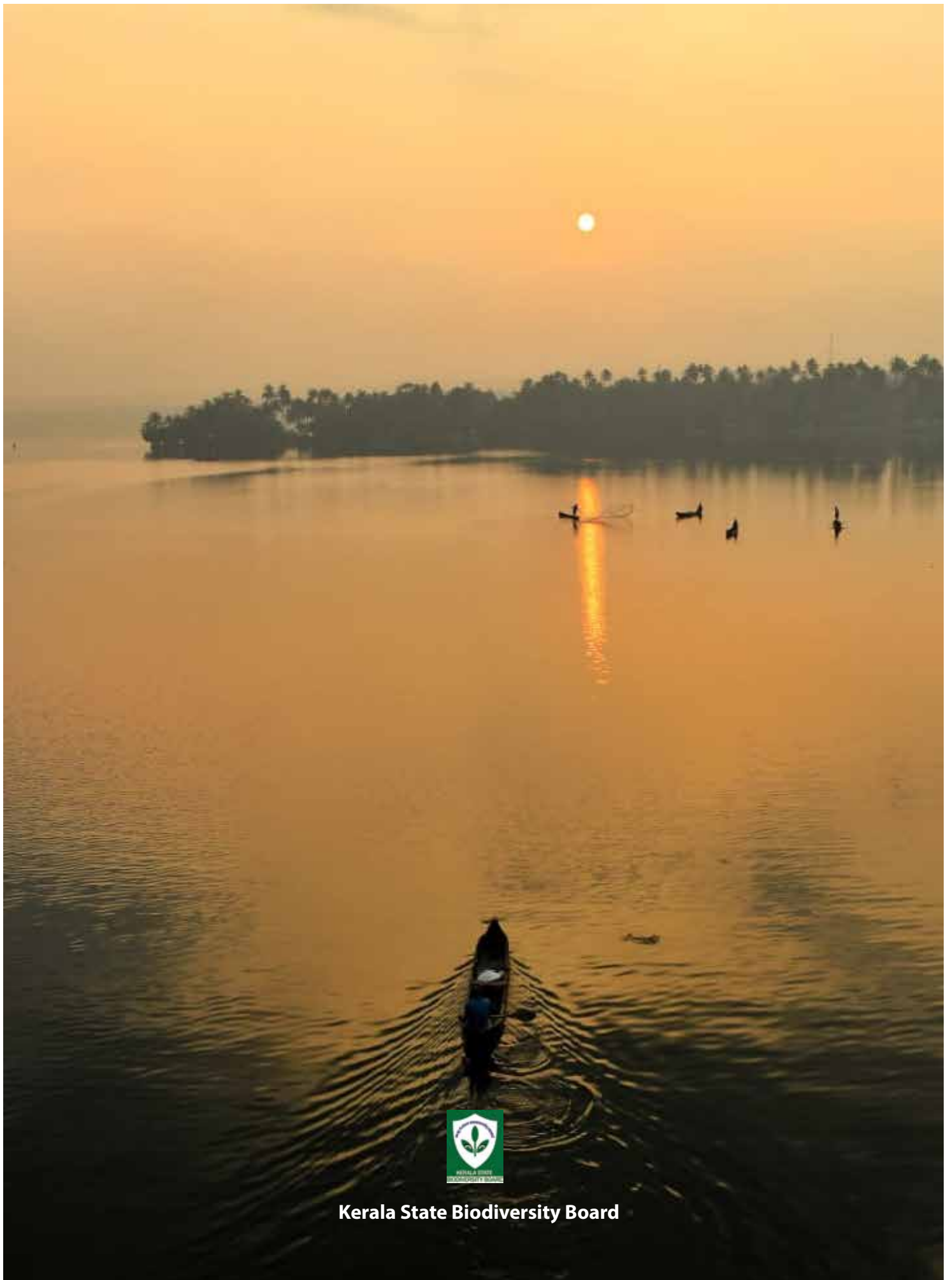
Annexure 4 - Funded Projects

	As at		Receipt				Payment			As at
	01-04-2019		Funds	Interest	Utilised	Assets	Refund OUT	31-03-2020		
1 DoECC	81,66,287	35,45,350	1,04,586	-44,53,696	-2,62,724	-	-	70,99,803		
Canal Works 2015 - 2016	27,20,000	-	-	-	-	-	-	27,20,000		
Gramavanam 2013 - 2014	25,00,000	-	-	-	-	-	-	25,00,000		
	2,20,000	-	-	-	-	-	-	2,20,000		
2 UNDP	26,90,437	7,99,920	62,473	-13,03,735	-2,62,724	-	-	19,86,371		
GEF Munnar Landscape Project 2014 - 2015	4,013	-	-	-22,320	-	-	-	-18,307		
GEF Munnar Landscape Project 2015 - 2016	2,23,952	-	-	-	-	-	-	2,23,952		
GEF Munnar Landscape Project 2018 - 2019	23,99,760	-	-	-12,81,415	-2,62,724	-	-	8,55,621		
GEF Munnar Landscape Project 2019 - 2020	-	7,99,920	-	-	-	-	-	7,99,920		
Interest Received	62,712	-	62,473	-	-	-	-	1,25,185		
3 National Biodiversity Authority (NBA)	16,27,209	23,05,430	42,113	-25,62,101	-	-	-	14,12,651		
Component Training Material and Printing (14 - 15)	20,726	-	-	-	-	-	-	20,726		
Developing and Revamping of Website (14-15)	2,05,393	-	-	-10,321	-	-	-	1,95,072		
Peer to Peer Learning (14-15)	1,14,718	-	-	-58,234	-	-	-	56,484		
Plan Fund from NBA	14,04,919	-	-	-	-	-	-	14,04,919		
Thematic Expert Committee (14-15)	3,82,116	-	-	-1,33,403	-	-	-	2,48,713		
Printing of BMC Reports (14-15)	93,398	-	-	-	-	-	-	93,398		
NBA - Capacity Building	-	7,00,000	-	-	-	-	-	7,00,000		
NBA Fund (COP 11 engagement) 2018-19	-7,44,375	-	-	-4,05,225	-	-	-	-11,49,600		
NBA Fund (COP 11 engagement)-2019-20	-	11,49,000	-	-11,24,335	-	-	-	24,665		
NBC 2017 Fund from NBA	-	-	-	-	-	-	-	-		
E-PBR - National Informatics Centre NBA	-	-	-	-50,349	-	-	-	-50,349		
PBR Monitoring Committee - Second Meeting	-	-	-	-3,23,804	-	-	-	-3,23,804		
LSG Biodiversity Conservation and Development	-	-	-	-	-	-	-	-		
International Biodiversity Day	3,511	4,56,430	-	-4,56,430	-	-	-	3,511		
Integrating Biodiversity Conservation	-	-	-	-	-	-	-	-		
Biodiversity Award	-	-	-	-	-	-	-	-		



	As at		Receipt		Payment			As at	
	01-04-2019		Funds	Interest	Utilised	Assets	Refund OUT	31-03-2020	
State level workshop on biodiversity action plan	-73,894								-73,894
Interest received	2,20,697		42,113						2,62,810
4 Coastal Ecosystem Conservation 2011 - 2012	43,215								43,215
	43,215								43,215
5 Plan Fund EMA	31,907								31,907
	31,907								31,907
6 MoEF	23,631								23,631
WGEEP	23,631								23,631
7 National Medicinal Plants Board (NMPB)	10,29,888								8,82,028
NMPB 2014 - 2015	-1,36,239				-1,47,860				-2,44,702
NMPB 2018 -2019					-1,08,463				
Resource Augmentation, Sustainable Harvesting and Value addition of medicinal plant resources through BMC	11,66,127				-39,397				11,26,730
8 National Centre for Sustainable Coastal Mft (NCSCM)									
Preparation of DPR for Conversation of Sacred Grove		4,40,000			-4,40,000				
		4,40,000			-4,40,000				





Kerala State Biodiversity Board