



ANNUAL REPORT

2021-22





GOVERNMENT OF KARNATAKA

ANNUAL REPORT

2021-22



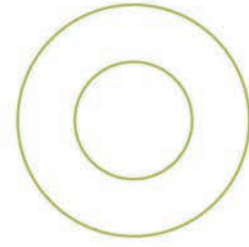
Environmental Management and Policy Research Institute
Bengaluru, Karnataka

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CHAPTER - 1
**ABOUT
THE INSTITUTE**

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1.1. CONSTITUTION

The Environmental Management & Policy Research Institute (EMPRI) is an autonomous institute established by Government of Karnataka on 17 September 2002 under the Department of Forest, Ecology and Environment. The Institute undertakes applied and policy research and organises capacity building trainings on concurrent environmental issues relevant to the society. Services provided by the institute seek to encourage and enable government, industry and civil society to safeguard and manage the natural resources effectively. The institute is registered under the provisions of Karnataka Societies Registration Act, 1960.

1.2. VISION

To be a knowledge centre inspiring and enabling society to create an environment of harmony between man and nature.

1.3. MISSION

1. To carry out research on current policy and environmental issues.
2. To provide world class training and advisory services on environmental management.
3. To enable and encourage the civil society, government and industries to safeguard and manage natural resources effectively.

1.4. OBJECTIVES

1. To provide capacity building & technical support to government, non-government & other institutions in addressing policy and environmental issues.
2. To provide consultancy services to industries, government Departments and other organizations in the field of Environmental Management.
3. To take up studies and to develop policy documents on various environmental aspects.

1.5. FUNCTIONS

1. To contribute towards the protection and management of environment & ecology through scientific, technical, policy research & other activities.
2. To assist government departments, non-government organisation (NGO) and public at large in performing the mandatory functions specified in the various environment laws, guidelines and judicial pronouncements from time to time and to assist the concerned agencies in setting up norms.
3. To undertake/develop studies and research in the field of environment protection and conservation for improving the overall quality of environment.
4. To develop expertise in the field of environmental research and to develop world-class consultants and to act as a referral institute.
5. To interact and/or to seek affiliation with national and international agencies working with similar objectives.
6. To undertake training and human resources development programs in the field of environment by organizing seminars/workshops and other programs for stakeholders.
7. To print, publish, exhibit books, pamphlets and periodicals, educative and informative materials that for promotion of the objectives of the institute.
8. To maintain an ENVIS (Environmental Information System) Centre and to develop, maintain and run a reference library and data centre with books, periodicals, films, video and other audio-visual materials.

1.6. GOVERNANCE

EMPRI functions under the direction of a Governing Body chaired by the Additional

Chief Secretary, Department of Forest, Ecology & Environment, Government of Karnataka. The Governing Body consists of representatives of various government departments including Department of Forest, Ecology & Environment, Department of Urban Development, Department of Industries & Commerce, Department of Health & Family Welfare, Department of Finance, Central Pollution Control Board (CPCB) and Karnataka State Pollution Control Board (KSPCB). The Director General (DG), EMPRI is the Member Secretary of the Governing Body. The DG being the Chief Executive of the Institute is responsible for day-to-day administration of the organization, supported by the officers deputed from the Government of Karnataka and personnel contracted/outsourced for specific purposes.

1.6.1 General Body

General Body is chaired by the Additional Chief Secretary, Department of Forest, Ecology & Environment, Government of Karnataka. The members of Governing Body are also the members of General Body. The General Body meeting is convened every year to consider and approve the Annual Administration Report, Audit Report, Income and Expenditure Statement etc. It also approves the budget plan for the institute.

1.6.2 Governing Body

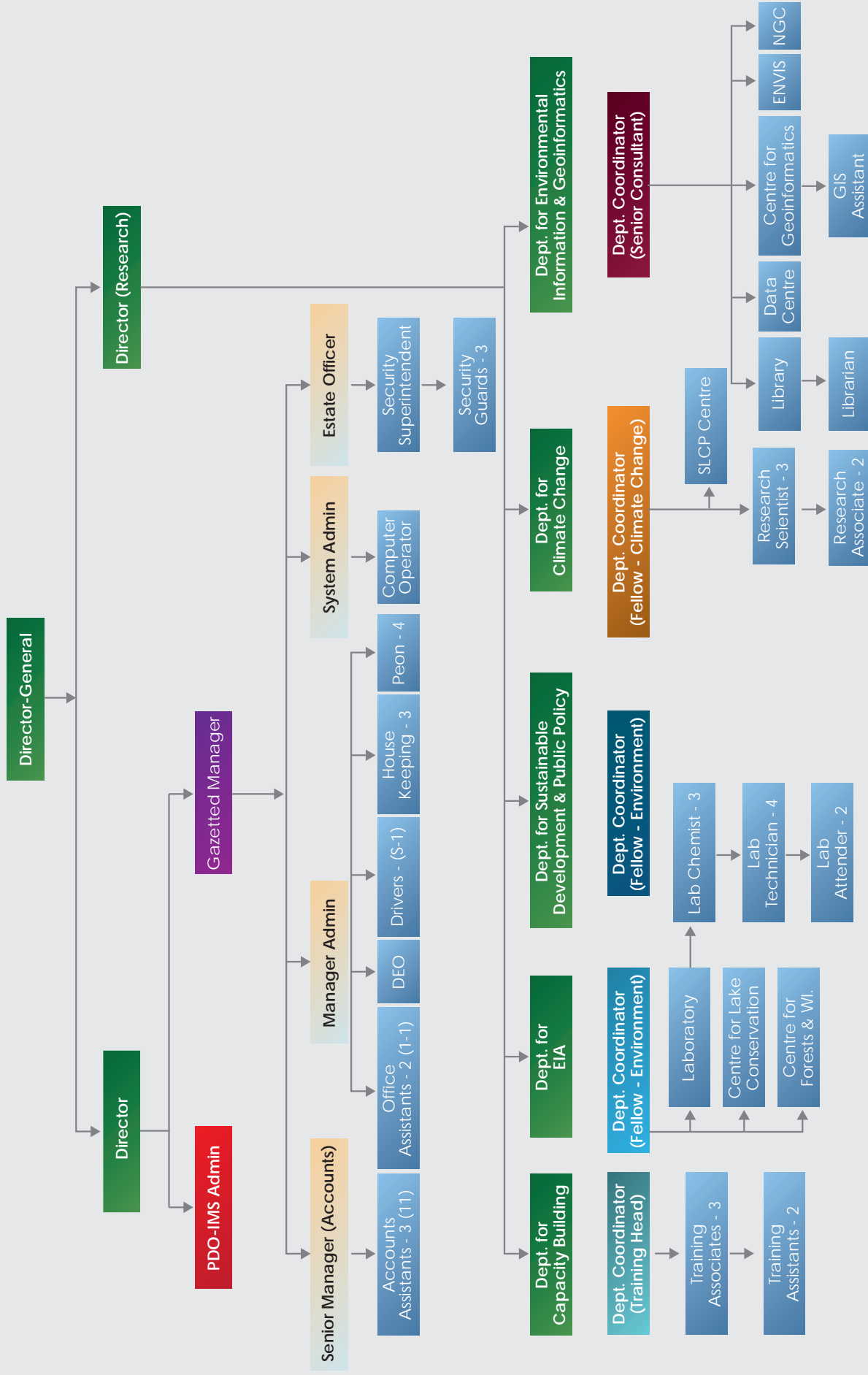
The Governing Body (GB) of the EMPRI is constituted by Government of Karnataka, nominating senior level functionaries of various Departments. The list of members of the Governing Body committee is placed in **Annexure – 1**.

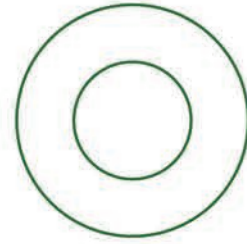
1.6.3 Committees

Following committees are constituted to advice and also to take decisions on specific matters.

1. **Executive Committee:** A five member Committee constituted by the Governing Body is chaired by the Director General.
2. **Research & Training Advisory Committee:** The RTAC is constituted as per decision taken in the 28th GB meeting and the Director General, EMPRI is the Chairman of the Committee. The Committee consists of 12 members including Government Officers and functionaries from eminent organizations like Institute of Social Economic Change, Karnataka State Pollution Control Board, Central Pollution Control Board and University of Agricultural Sciences. The composition of the committee is placed in **Annexure – 3**.
3. **Training Evaluation Committee:** EMPRI under takes training activities on various environmental issues and a four member committee has been constituted to evaluate the training programmes conducted by EMPRI. The committee is chaired by the Director, EMPRI and Director (Research), EMPRI, Shri. T. Mahesh, Chief Environmental Officer, Karnataka State Pollution Control Board, Bangalore (Concurrent Charge) and Project Development Officer (Additional charge), EMPRI are the members.
4. **Technical Advisory Panel:** A Technical Advisory Panel (TAP) has been constituted to accord approval to configuration of Computer Hardware/Software required to be purchased. The 65th Executive Committee of EMPRI held on 23.02.2022 reconstituted the Committee which has been ratified by the Governing Body in its 60th meeting held on 10-06-2022. The Director General, EMPRI is the Chairman and comprises of five other members. The composition of the Committee is placed in **Annexure – 4**.

1.7. ORGANIZATIONAL STRUCTURE:





CHAPTER - 2

MAJOR

ACTIVITIES



2.1 DEPARTMENT FOR CAPACITY BUILDING

a) Training Programmes

During the year 2021-22, a total of **139** (134 online and 05 offline) training programmes were organized and totally 18,307 participants have been trained. Due to Covid-19 pandemic situation most of the trainings were organized in virtual mode. The details are given in **Annexure - 5**.

b) Focus areas of the training programme

Sl. No	Name of the training program	No. of training programs	No. of participants Attended	Name of the sponsors
1	Waste Management Rules -2016	08	446	EMPRI
2	Climate Change	20	1730	EMPRI
3	Phytoremediation	01	12	Department of Municipal Administration
4	Environmental Pollution and it's control	25	2909	EMPRI
5	Environmental laws & Compliance	05	434	EMPRI
6	Awareness on Air pollution	34	3571	Ministry of Environment, Forest and Climate Change Under Swacchata Action Plan
7	Awareness on Water pollution	04	1097	Ministry of Environment, Forest and Climate Change Under Swacchata Action Plan
8	Bio-Medical Waste Management	31	7452	Ministry of Environment, Forest and Climate Change Under Swacchata Action Plan
9	Wastewater treatment plant-technician	02	54	Department of Skill development, livelihood and entrepreneurship
10	Others	09	601	EMPRI
	Total	139	18,307	

c) Projects undertaken

i. Environmental Audit of Common Bio-medical Waste Treatment Facilities in Karnataka

In Karnataka state there are about 26 Common Bio-medical Waste Treatment Facilities (CBMWTF) to impart the necessary treatment and disposal of the bio-medical waste generated from member health care facilities, which would reduce the adverse effects of bio-medical waste on human health and environment. EMPRI has been recognised as the third-party to carry out the audit of the Common Bio-medical Waste Treatment

Facilities (CBMWTF) by Karnataka State Pollution Control Board. third-party audit of two facilities M/s Medicare Environmental Management (P) Ltd, Nelamangala and M/s Maridi Eco Industries Pvt Ltd , Ramnagar were carried out during 2019. The online audit of remaining 24 facilities were carried out during 2021-22 which are as given below.

SI No	Date	Name of the facility
1	16.11.2021	The BVV Sangha Rural Development Foundation, Bagalkot
2	18.11.2021	Shushrutha Bio Medical Waste Management Society, Shimoga
3	25.11.2021	Sushanth Environment technologies Pvt Ltd., Davangere
4	30.11.2021	Enviro Biotech, Bidar
5	04.12.2021	Ayush Envirotech Pvt Ltd., Udupi
6	14.12.2021	Raichur Indian Medical Association CBMWTF, Raichur
7	28.12.2021	GIPS Bio-Tech, Mysore
8	11.01.2022	Kenera IMA, CBMWTF, Karwar
9	12.01.2022	Karnataka Private Medical Establishment Association, Vijapura
10	20.01.2022	Gadag Envirotech Pvt Ltd, Gadag
11	29.01.2022	Ramky Energy and Environmental Pvt Ltd., Mangalore
12	15.02.2022	Meera Envirotech, Kolar
13	16.02.2022	VV Incin Solutions Pvt Ltd, Chitradurga
14	22.02.2022	Suryakanth Environmental Technology, Bellary
15	24.02.2022	Prajwal Management Systems, Chikkaballapura
16	25.02.2022	Sri Sharana Associates, Koppal
17	28.02.2022	Prajwal BMW Management System, Hassan
18	02.03.2022	Parisara Associates, Yadgiri
19	03.03.2022	Rio Green Environ Indian Asts, Dharwad
20	04.03.2022	Brundavana Foundation, Kalaburagi
21	08.03.2022	Belgaum Green Environmental Management Pvt Ltd
22	11.03.2022	Shree Consultant, Mysore
23	25.03.2022	Anu Autoclave and Incin Services, Hoskote
24	-	Association of Medical Establishment, Belgaum – The facility is Closed

ii. Inventorization of e-waste in Karnataka

With the financial assistance from KSPCB, EMPRI has taken up the above mentioned project. The objectives of the study are a) to assess, identify and quantify the waste generated from electrical and electronic equipment waste for the years 2018-19, 2019-20 and 2020-21, b) to examine the existing e-waste recycling system, c) to study the problems/risks posed by the recycling process at present/future, d) to estimate the existing quantity and future projection of e-waste in the study area, e) to prepare the directory of stakeholders, f) to evaluate the capacities of existing stakeholders and infrastructure for reuse, recycle and disposal of e-wastes g) to analyse the environmental and social sustainability of present system, h) to determine e-trade economics, and i) to conduct stakeholder consultation. The survey of bulk and individual consumers is under progress



e-Waste



d) Photo Gallery – Training programmes



Wastewater Treatment Plant- Technician Batch-4 Participants



Wastewater Treatment Plant- Technician field visit – Doddabele STP



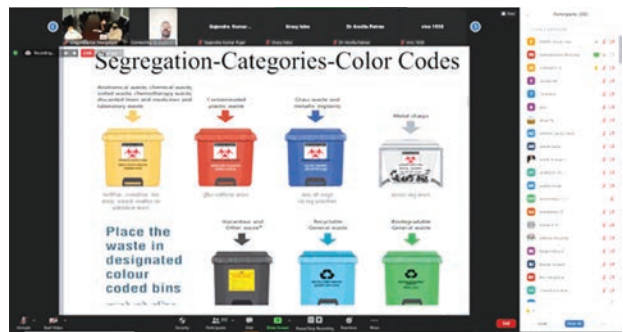
Inauguration program of Wastewater Treatment Plant- Technician Batch-5



Wastewater Treatment Plant- Technician field visit – Devanahally faecal sludge



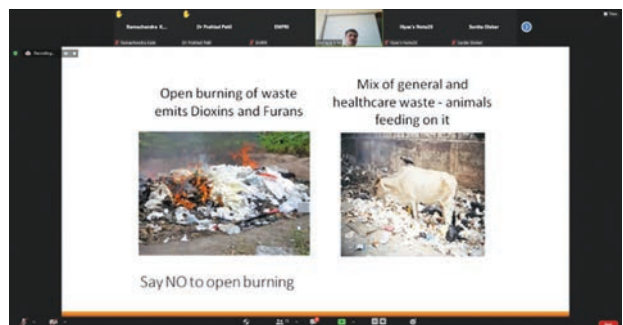
District level online training program on Biomedical Waste Management – Bangalore rural



District level online training program on Biomedical Waste Management – Mysore



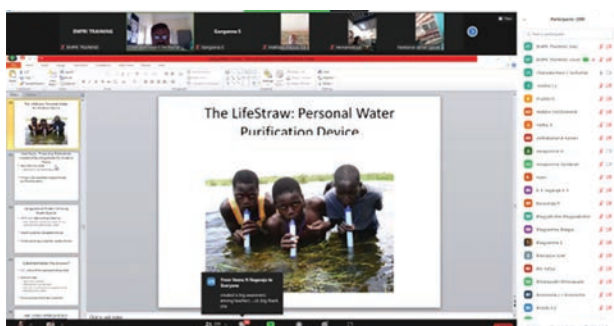
Online training program on Sustainable development goals



Online training program on Waste management rules -2016



Online training program on Awareness on Air Pollution



Online training program on Awareness on Water Pollution

2.2. RESEARCH PROGRAMMES

EMPRI conducts research on concurrent environmental issues of immediate relevance for the society. In every study, the research carried out identifies problems, determines underlying causes and proposes measures to mitigate them. In the year 2021-22, research work taken under by different centers at EMPRI includes the following:

2.1.1. Centre for Lake Conservation

Lakes are ecologically precious water bodies. Conservation and development of these invaluable, traditional water bodies is of paramount importance. Due to rapid urbanization and industrialization, majority of these lakes have lost their original characteristics. Restoration of these lakes is not only an urgent need but also a challenging task. The Centre facilitates the conservation and development of these surface water bodies in the state in an environmentally sustainable manner by carrying

out research studies. The centre also acts as a connecting bridge between the decision makers and Government in conservation and management of these waterbodies. The following few project works were undertaken in this aspect.

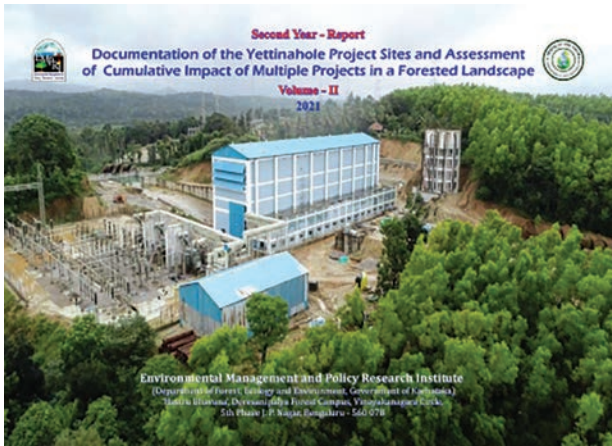
1. Documentation of the Yettinahole Project Sites and Assessment of Cumulative Impact of Multiple Projects in a Forested Landscape

The Government of Karnataka (GoK) through Karnataka Neeravari Nigama Limited (KNNL) has initiated Yettinahole Integrated Drinking Water Supply Project in Sakleshpura taluk of Hassan district, Karnataka. The water would be diverted to the drought prone areas such as Kolar, Chikkaballapura, Ramanagar, Bangalore Rural, Tumakuru, parts of Chikkamagaluru & Hassan districts.



The main aim of the Yettinahole drinking project is to lift 24.01 TMC of water during rainy

season from Yettinahole, a westerly flowing stream near Sakleshpura by way of constructing eight weirs across its tributaries and lift the water to the eastern plains districts of the Karnataka for drinking water purpose. The project is designed to quench the thirst of nearly 7 million people. Out of 24.01 TMC lifted water, 15.029 TMC will be utilized for the drinking water supply and the remaining 8.967 TMC will be used for filling up the Minor Irrigation tanks for ensuring ground water recharge.



The project involves diversion of 13.93 Ha of forest land in Sakleshpura forest area. The Visvesvaraya Jala Nigam Limited (VJNL), and Karnataka Neeravari Nigama Limited (KNNL) have obtained stage-1 Forest clearance from Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India, with certain stipulated conditions. VJNL has entrusted two tasks pertaining to the environmental aspects to Environmental Management and Policy Research Institute (EMPRI), for study with a cost of Rs.1,20,57,000/-. The following are the two tasks assigned:

Condition No. 26. In order to outline benchmark the present status of ecology in the project area and particularly the project work-sites, survey and videography based study may be initiated at the cost of user agency. This will facilitate monitoring of project sites and decision making in future.

Condition No. 27. Periodic assessment of cumulative impact of multiple projects in the forested landscape by the regulatory authority. It allows an adaptive management in the landscape and an opportunity to evaluate and realign the mitigation strategies

Confined to the above two conditions reason-wise monitoring of the environmental components was undertaken in the second year to monitor the various environmental components seasonally in the project area. Based on the baseline environmental data, secondary data, DPR and the visual observations made during the field visits, the report has been prepared and submitted to the project proponent. The entire report has been compiled into two Volumes. The Volume-I outlines the findings of the Condition No.27 *i.e.* impacts assessment of the individual project that contributed to the cumulative effects on forested landscape ecosystems in the combined catchment area of Kempuhole. Whereas, Volume-II outlines the Condition No.26 *i.e.* present ecological status of Yettinahole project working sites which has been documented through DRONE photography and videography.

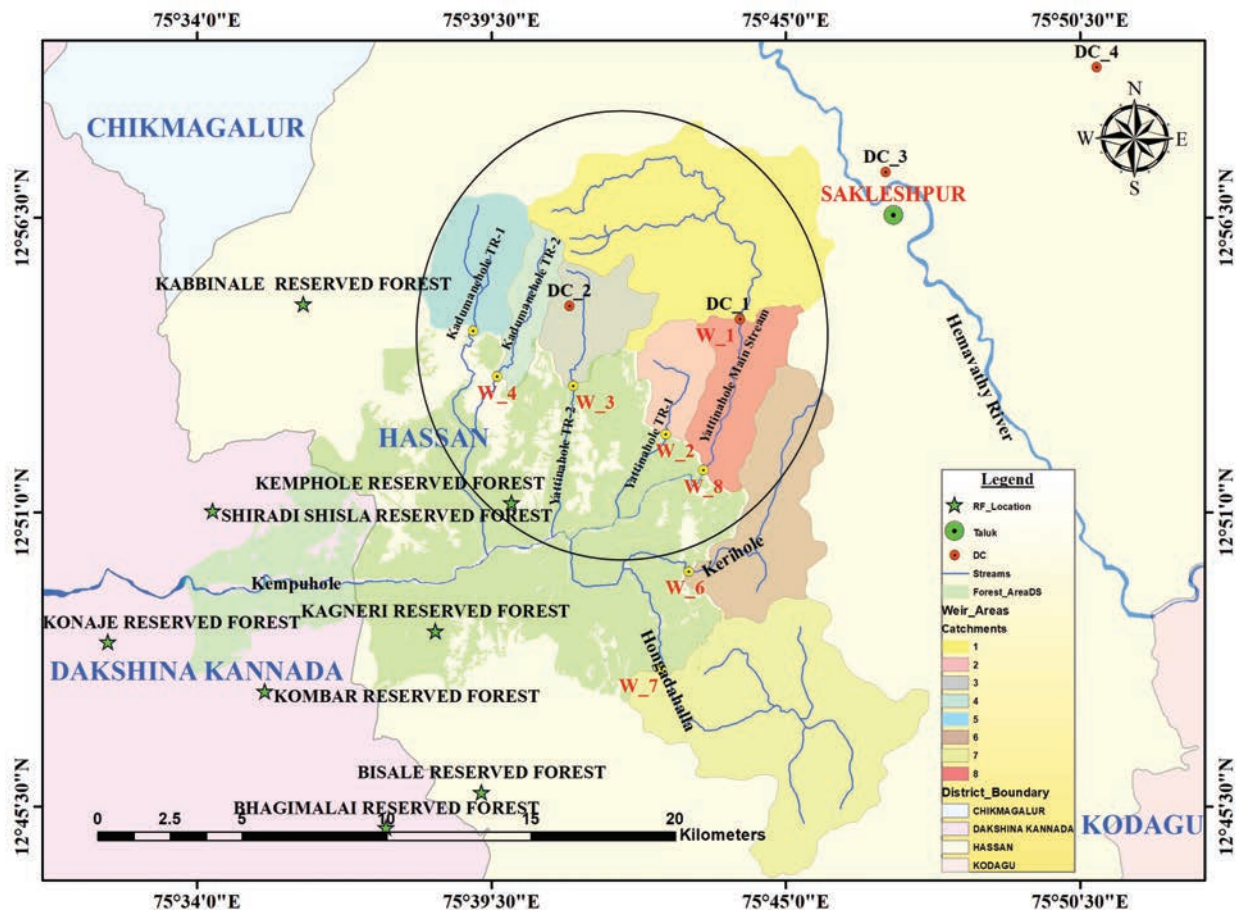


Fig.1 Study Area (Combined Yettinahole Catchment Area) – Source: EMPRI

1.1. Study Area

An area encompassing 315.95 sq.km of the combined catchment area of Kempuhole i.e. Yettinahole and Kempuhole catchment area was considered for achieving terms of references of the study (Fig.1).

1.2. Methodology

Field visits were carried out to the Yettinahole project working sites for documenting the present ecological status of Yettinahole project. The impact assessment on forested landscape due to Yettinahole Drinking Water Project and also other projects (Construction and Operation phase) was carried out in light of the cumulative impact assessment on the identified ecosystem components in the combined Kempuhole catchment area.

1.3. Findings of the Study

The findings of the study based on environmental monitoring in the study area are summarized below

- **Surface Water Quality** showed presence of Iron concentration in all the samples of the monsoon, post-monsoon and few samples of winter season. Whereas, Total coliform, was found exceeding the standard limits in most of the samples.
- **Groundwater Quality** showed the presence of Iron concentration in the samples in all the seasons.
- **Planktons analysis** The Phytoplankton and Zooplankton population fluctuated seasonally in the sampled locations i.e. Phytoplankton density was found

to be high during winter and low in post-monsoon season. Whereas Zooplankton species was found to be less in its density in all the seasons.



Fig.2. Collecting water samples in the

- **Ambient Air Quality Monitoring**

The concentration of pollutants $PM_{2.5}$ and PM_{10} exceeded the standard limits prescribed by CPCB at all the monitoring location in winter season.



Fig.3. Ambient air monitoring in the study area

- **Ambient Noise Levels** The noise levels exceeded the standard limits at all the monitoring locations except two locations in monsoon season.
- **Landuse changes (2015, 2017 and 2019):** Indicated increase in built-up area, water body and waste land.

2.4. Mitigation Measures:

Based on the baseline data and visual observations made during the course of the study, mitigation measures have been suggested for implementation on field for minimizing the impacts due to project activities, for the project proponent.

2. Assessment of Waterbodies in Tumakuru and Kolar City/Municipal Corporation Area (Urban and Semi-urban) of Karnataka

The key objective of the study are; 1). To inventorize the waterbodies (*kere, kunte and katta*); 2). Assess the present status of the waterbodies in terms of pollution load/changes undergone 3). Assess seasonal water quality and document the biodiversity; 4). to prepare comprehensive waterbodies database and Waterbodies' Health Report Card (WHRC)/Atlas; 5). to assess the Landuse/landchange over the time period using satellite imageries and 6). to prepare strategic action plan for specific waterbodies for conservation and restoration.

Currently, preliminary field visits for the inventorisation of all the waterbodies in the study area is completed. Based on this documentation, collection of water samples for quality test and interpretation of the landuse/landcover changes over a period of time based on the satellite imageries (2011 and 2021) is under progress.

2.1.2. Centre for Climate Change

Strengthened as Karnataka State Strategic Knowledge Centre for Climate Change and economical support of Government of Karnataka & Government of Indi, EMPRI has taken forward several research activities and programs on climate change. In 2021-22, total of sixteen projects were undertaken in collaboration with other research institutions like IISc, ISEC, CSTEP, UAS and KSSRDI, of which two projects have been completed and 14 projects are ongoing.

I. Research Activities

A. Completed Research Projects

1. Promoting Green Buildings to Combat Climate Change A Study of Bengaluru

The project was proposed to document and create a database on green buildings/typology in Bengaluru and analyse the role of institutions in promoting green buildings/architecture. The green buildings in Bengaluru across the categories like apartments, individual homes, office spaces and commercial establishments from the green building certifying agencies/bodies and eco-friendly architects like GRIHA, LEED, IGBC and BIOME were identified for the on-field documentation. Responses have been recorded through Google surveys and through direct interaction. Some of the key findings of the study were; the demand for green buildings is increasing especially in the commercial sector, the draft Building Code has incorporated all green features and detailed out all specifications regarding certification making it easier to adopt. It is recommended to make the existing homes eco-friendly by retro-fitting. The private developers have been promoting green buildings by giving certain concessions to their buyers. Constructing green buildings is not an obligation and not incentivised, hence makes green buildings construction restricted. Lack of locally available material also may discourage builders to opt for green buildings. In the context of governance, there has to be a one-point contact for processing the documents to ease and speed up the process of green initiatives.

2. Mapping of Carbon-di-oxide gas in the selected BBMP areas of Bengaluru City

The project was proposed to estimate the concentration of Carbon-di-oxide from selected Bruhat Benngaluru Mahanagara Palike (BBMP) areas of Bengaluru city. The air sampling was done in seven different monitoring stations of Karnataka State Pollution Control Board (KSPCB) across the 4 zones. A 24-hour sampling was done using Out Door Air Quality Monitor (Airveda) in

each selected location types namely mixed urban, residential, sensitive and industrial areas. A total of 42 data sets have been obtained for three months (January - March, 2021). The concentration of CO₂ estimated at different locations ranged from 397.64-442.06 ppm. As per the findings it is known that, the concentration of CO₂ is more or less similar in different locations of the city irrespective of the location type.

3. Impact of Climate Change on Sericulture in Karnataka and Implementation of Adaptation and Mitigation Technologies at Farmers Level

The current study was conducted to check whether climate change in temporal scale (long term change in 30 years) could impact the sericulture. Though there was no strong correlation of climatic parameters and productivity in established tracts of sericulture, overall analysis on a temporal scale shows that there is significant relation between rainfall/temperature and cocoon productivity. This study based on secondary data could show validation of the impact of long term climate change on sericulture. As it is a human oriented biological activity, there are many interventions and delineating the true impact of climate change is mostly difficult. The zonal variations in productivity itself indicate the role of eco-climatic conditions on productivity.

4. Vulnerability of Diverse Communities of Climate Change in Different Districts of Karnataka

The main goal of the study is to examine the impacts of climate change on the socio-economic impacts of diverse communities such as tribal group (Kodagu) based landslide and fishing communities (Mangalore) through the flood. Further, this study has also to examine the complexities of adaptation to climate change in both the communities of Karnataka. climate change impacts on agricultural production, forest products, loss of man days and

income due to flood and landslide. In Kodagu 97.5 per cent of the respondents revealed that their food supply, drinking water supply, income and health was affected. In the disaster prone area of Mangalore, 97.5 per cent of the sample respondents indicated that climate change has affected their livelihood; and 52.5 percent of the respondents indicated that there was inconvenience in food supply, income and health.

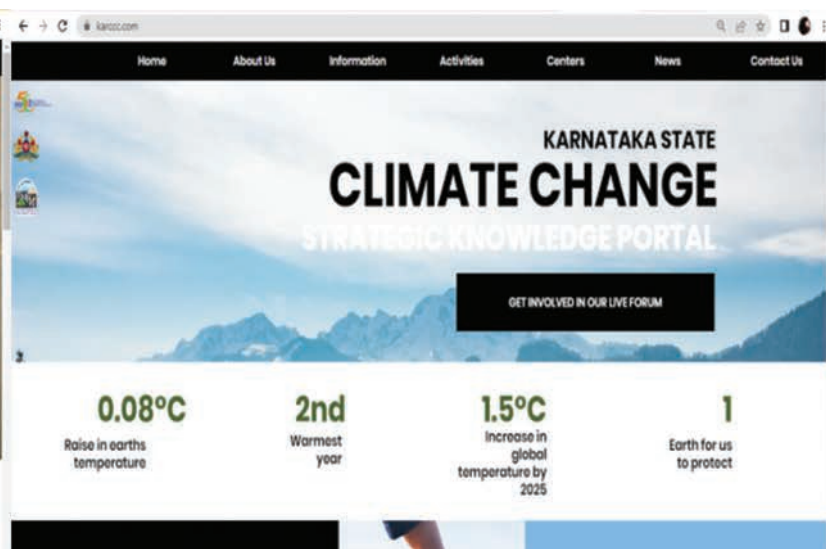
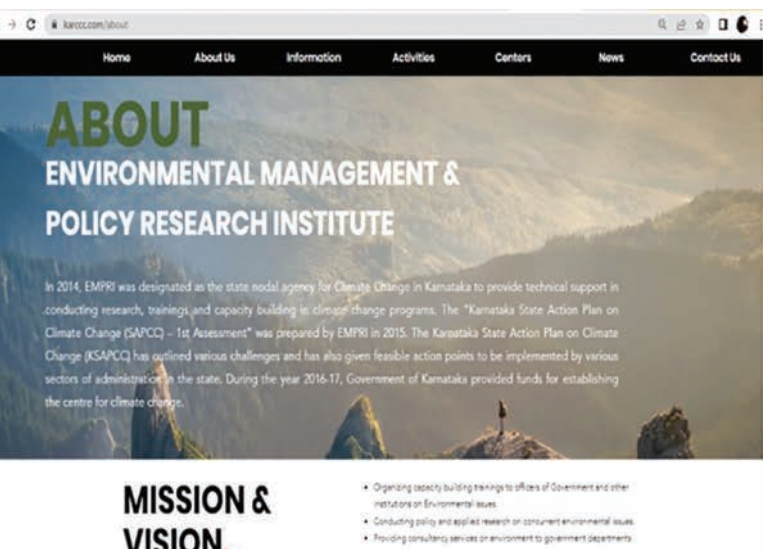
5. DST project: Establishing/ Strengthening the state climate change centre/cell under NMSKCC (SCCC-NMSKCC) in the state of Karnataka

Environmental Management and Policy Research Institute (EMPRI), Bengaluru, under the financial assistance from Climate Change Program Division, Department of Science and Technology, Government of India, New Delhi, has completed the above entitled project and the report is under preparation. The project has strengthened the state climate change cell in Karnataka in establishing a state of art laboratory, an exclusive web portal, research studies on climate change, documentation of case studies of government schemes/programs, capacity building and awareness creation on climate

change. A new knowledge generated from the project was the development of a baseline database of the floristics in Permanent Preservation Plots established in tropical forests of Bangalore for long term studies on climate change which would create a new knowledge on climate related aspects of diverse forest ecosystems. This study has been complemented by the installation of weather monitoring stations at Bannerughatta National Park (BNP) and Doresanipalya Reserve Forest (DRF) that provide the data on weather parameters such as rainfall, temperature, humidity, solar radiation, wind speed and wind direction. The project completion report is under progress.

5.1. Strategic Knowledge web-portal for Climate Change

An exclusive web portal is developed and hosted under the name “Karnataka State Climate Change Strategic knowledge portal” (<https://www.karccc.com/>). This very portal acts as a platform for knowledge dissemination pertaining to the climate change in the state. The portal provides information about the climate change research publications by EMPRI and the latest climate change ews in the state and nation. The portal screenshots are as follows.



5.2. Phenological studies on selected tree species of Thalewood house, Bugurikallu and Doresanipalya localities in Bannerghatta National Park (BNP) and Doresanipalya Reserve Forest (DRF)

Community level phenological studies have been taken up in BNP and DRF to assess the variation in phenophases in relation to weather parameters. The phenological studies were undertaken by tagging 556 trees around the 1-ha permanent preservation plots (PPPs) in Thalewood House, Bugurikallu, and Doresanipalya (254 in Thalewood House locality, 250 in Bugurikallu locality, and 52 in Doresanipalya locality). The trees so tagged were mostly representative of the plants in the 1-ha PPPs. The tagged plants of Thalewood House comprised of 67 species whereas Bugurikallu and Doresanipalya

comprised of 67 and 21 species respectively. Totally 96 unique species in all the three localities are being observed.

Community level phenological observations for 33 months in the 3 locations have been completed. Analysis of data for the past 2 years provide an insight into the mode of leaf initiation and flower initiation. It is seen that the community level leaf initiation is nearly the same in all the three localities (Figure 1). Flowering is a very important process and it is seen that flower initiation follows leaf initiation in all the localities; a positive correlation between leaf initiation and flower initiation (Figure 2) is seen. The broader base in the first peak is due to the non-availability of data for April and May 2020 (during Covid19 lockdown).

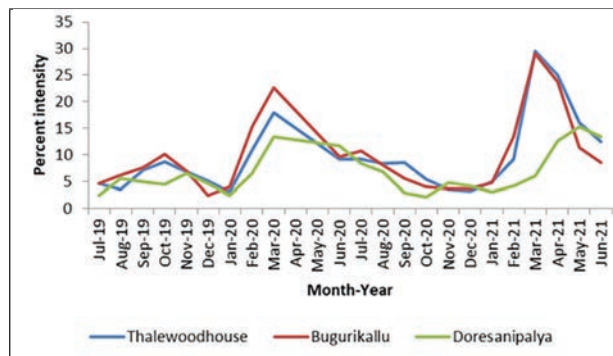


Figure 1: Leaf (LF2) in Thalewood House, Bugurikallu and Doresanipalya localities

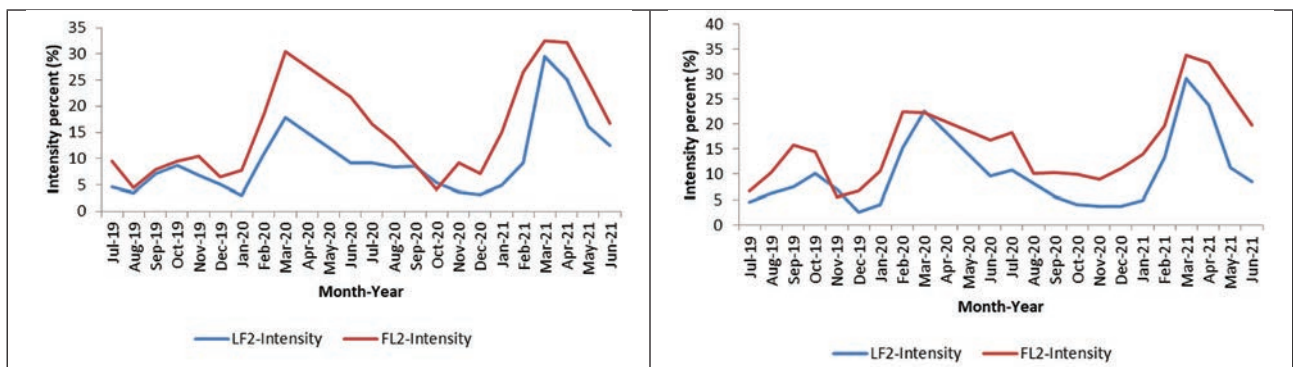


Figure 2: Leaf (LF2) & Flower initiation (FL2) in a) Thalewood House b) Bugurikallu locality

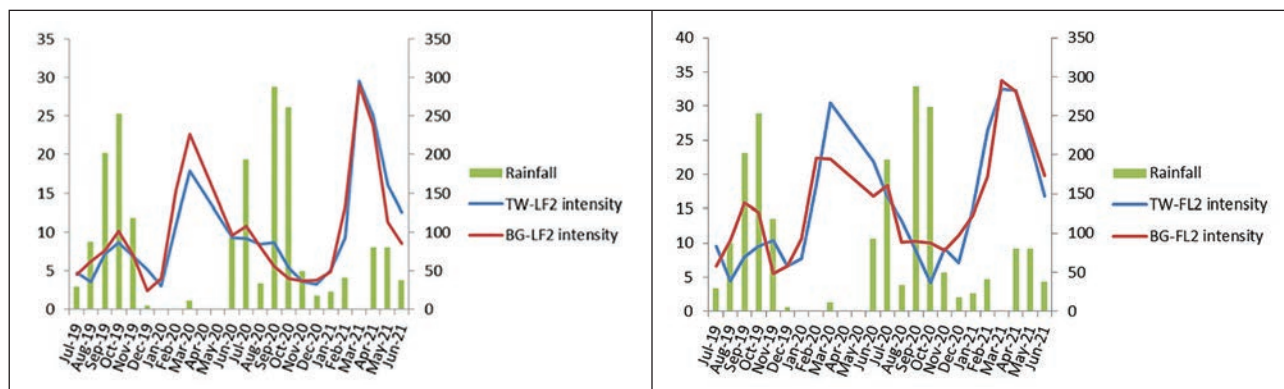


Figure 3: Leaf (LF2) initiation and Flower initiation (FL2) versus Rainfall

It is also seen that the leaf initiation/flushing is during the dryer months from January to June. These phenomena can be confirmed when the intensity of leaf initiation and flower initiation is plotted against monthly rainfall. As can be seen in Figure 3, leaf initiation and flower initiation occurs during the dryer months when the soil moisture is low.

Similarly when the leaf dehiscence was plotted, it was seen that dehiscence (LF5) is nearly similar in all the three localities (Figure 4) and starts during the month of November.

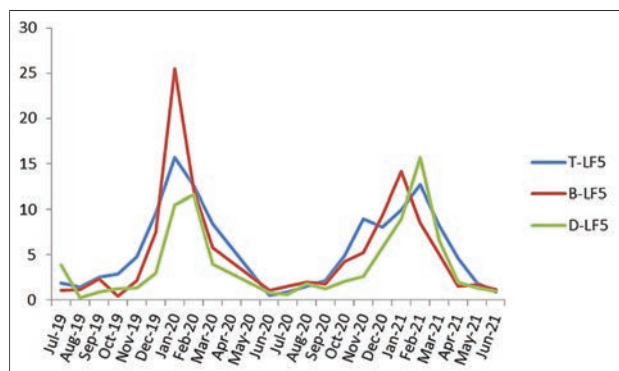


Figure 4. Leaf dehiscence (LF5) seen in Thalewood House, Bugarikallu & Doresanipalya localities

The long-term monitoring of different stages/phenophases of leafing, flowering and fruiting would provide us information on the variation seen and this could be attributed to the abiotic factors such rainfall, temperature, sunshine hours, solar radiation

and humidity. These phenological observations will be continued so that the variations in phenophases could be captured which will provide useful information on the effect of climatic change..

5.3. Leaf area Analysis for selected species at Permanent Preservation Plots

The leaf area directly relates to the process of photosynthesis which in turn has a great impact on the growth of plant, respiration, evapotranspiration, carbon accumulation and biomass production. Specific leaf area is the ratio of leaf area to the leaf dry mass, the reverse of which gives the leaf mass per area. The correlation of specific leaf area (SLA) with the photosynthetic activity of plants helps in understanding the biomass production capability of particular species.

Leaf area analysis of six species at Doresanipalya forest (*Pterocarpus marsupium*, *Diospyrus melanoxylon*, *Santalum album*, *Shorea talura* and *Ochna obtusata*) and five species each at Thalewood house (*Olea dioica*, *Syzygium cumini*, *Cassia fistula*, *Ciphadesa basifera* and *Glochidion velutinum*) and Bugarikallu plot (*Ochna obtusata*, *Maytenuse marginata*, *Ixora nigricans*, *Stereospermum suaveolens* and *Soymida febrifuga*) were conducted. It was found that during all the three trials (sampling carried out on Oct 2019, Dec 2020 and Nov 2021), the highest SLA was recorded by *Ciphadesa basifera*

i.e., 264.31cm²/g, 235.94cm²/g and 277.60cm²/g at Thalewood house; *Pterocarpus marsupium* i.e., 165.01cm²/g, 114.06cm²/g and 158.27cm²/g at Doresanipalya Forest; and *Stereospermum suaveolens* i.e., 123.64cm²/g, 110.72cm²/g and 101.69cm²/g at Bugurikallu.

5.4. Assessment of Carbon Stock in Permanent Preservation Plots of Bannerghatta National Park and Doresanipalya Forest, Karnataka India

Quantifying carbon stock in natural forests is crucial in planning the management of such ecosystems for their conservation and studying their role in the mitigation of the effects of climate change. Above and below ground carbon storage potential in different vegetation types of Permanent Preservation Plots (PPP) established in 2017 at Bannerghatta National Park and Doresanipalya forest were assessed. Thalewood house represents moist deciduous forest, Bugurikallu PPP represents drier forest with thorny scrub stunted trees and Doresanipalya PPP represents dry deciduous degraded forest. Allometric equations are used to estimate the amount of carbon in above-ground biomass, taking the total height (H) and the diameter at breast height (DBH) of trees whose DBH is equal to or greater than 1 cm. Above ground biomass of trees was found to be 352.66Mg ha⁻¹ and 176.35Mg ha⁻¹ of carbon in Thalewood House PPP, 69.27Mg ha⁻¹ of biomass and 34.63Mg ha⁻¹ of carbon in Bugurikallu PPP and 377.0Mg ha⁻¹ of tree biomass and 188.50Mg ha⁻¹ of carbon in Doresanipalya PPP. Carbon content in soil collected at 0-30cm depth is being estimated using CHNS

elemental analyser. The soil carbon concentrations of Thalewood House, Bugurikallu and Doresanipalya PPPs for the year 2020 (monsoon) were found to be 2.65% (± 0.75), 1.48% (± 0.52) and 1.24% (± 0.30) and for the year 2021 (post monsoon) was found to be 2.36% (± 0.40), 1.45% (± 0.37) and 1.11% (± 0.26) respectively. The obtained values are evident to project that seasonal variations play a major role in carbon stock increment.

5.5. Nutrient Analysis of the forest soil in Permanent Preservation Plots

The soil samples were collected from the 25 subplots of each of the 1-hectare Permanent Preservation Plot at Doresanipalya forest (dry deciduous and degraded) and Bannerghatta National Park i.e., Thalewood house (moist deciduous) and Bugurikallu (dry deciduous). The samples were analyzed to estimate the physico-chemical parameters such as moisture content, pH, electrical conductivity, calcium, magnesium, potassium, sodium, available phosphorus, copper, zinc, manganese, iron and percentage of carbon, nitrogen & sulphur content.

The study from established PPPs in BNP and DRF provided the baseline data of the soil nutrients content. Among the three PPPs established, Thalewood House PPP was found to be rich in most of the soil nutrients that were analyzed followed by Bugurukallu PPP and Doresanipalya PPP. The purpose of the study was to determine the effect of climate change on the soil health, which would be achieved by continuous monitoring for a few more years on a seasonal basis.



Bacteria

Fungi

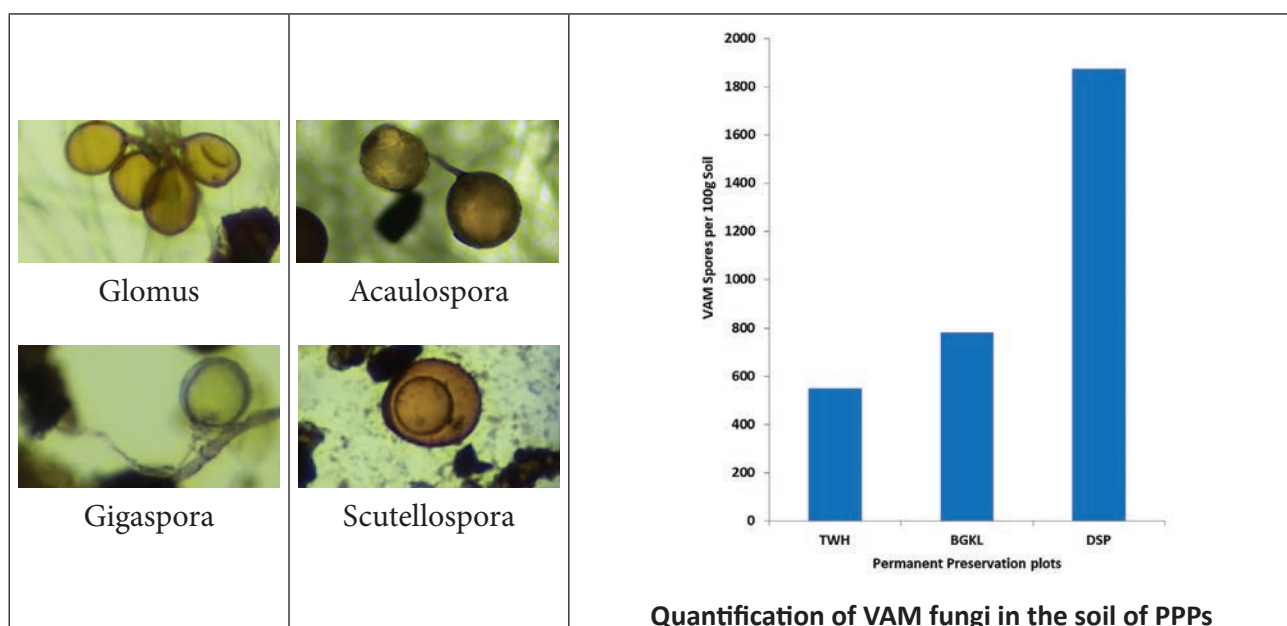
Actinobacteria

5.6. Microbiological studies on forest soils of Permanent Preservation Plots (PPPs)

The main objective of the study was to understand the microbial abundance in the soils of permanent plots of Banneraghatta National Park (BNP) and Doresanipalya Reserve Forest (DRF) and observe the presence of beneficial microorganisms in the forest soils, which help in the plant growth by promoting nutrient availability and enhancing disease resistance. The microbial analysis in forest soils have revealed that the doresanipalya plot recorded highest microbial population with Pseudomonas (30.0×10^6 cfu) followed by actinobacteria (5.7×10^5 cfu) and fungi (2.0×10^4 cfu), whereas bugurikallu plot of BNP has highest number of azotobacter sp (2.6×10^4 cfu)

and thalewood house plot showed the presence of phosphate solubilizing bacteria (2.0×10^4 cfu) when compared to the other plots.

The quantification of VAM fungi in the soil of PPPs has reported the presence of vesicular arbuscular mycorrhiza (VAM) spores in all the three plots recording higher spore number in Doresanipalya plot (DSP) (1872 spore per 100 g soil) followed by Bugurikallu plot (BGKL) (783 spore per 100 g soil) and Thalewood house plot (TWH) (548 spore per 100 g soil). Among the VAM Spores, Glomus species were found dominating in all the three plots. The study envisages that the dry deciduous forests accommodate higher microbial population than the mixed moist forests.



B. On-going projects

1. Butterflies as Climate Change Indicators – A study in different Eco-climatic Zones of Karnataka –Phase II

Field work was carried out in different eco-climatic regions of Karnataka- Agumbe, Bangalore, Dharwad, Gulbarga and Mangalore. The study was conducted from February 2020 to February 2022. The seasons were taken as Summer (February to May), Rainy (June to September) and Winter (October to January). Field work was carried out in each month where individual species of butterflies and their numbers were recorded within 2.5m on both sides of the transect line and 5m above the eye level height. The tremendous increase in the sampling efforts during the year 2021 resulted in sighting of more number of species i.e. 170 species and 21,539 individuals. A total of 179 species of butterflies belonging to six families, which represent 110 genera were documented during the study period.

Highest number of species were recorded in the district of Mangalore (104 species) and lowest in Dharwad (67 species), Individuals recorded was highest in Gulbarga due to increase in sampling frequency, and reason for low number of individuals in Dharwad and Agumbe is due to low number of sampling. The alpha diversity observed was high in Gulbarga ($H= 4.11$) due to high number evenness distribution of species and it was low in Bangalore region. The species richness index was observed to be high in Agumbe when compared to all other study regions.

Over all by combining data of all locations high number of species was observed in the month of December 2021. In Agumbe, highest number of species is observed during December, followed by Bengaluru in August and September, Dakshina Kannada in November, Dharwad in December and Gulbarga in December.

2. Pathanga enabled Butterfly monitoring program for Karnataka

Butterflies contribute to major ecosystem services such as pollination, serve as food source for higher organisms like reptiles and birds, act as environment indicators for pollution, landscape changes, climate change etc. They are extremely sensitive to changes in the environment. They live on plants, which are affected by the change in climate. Hence diversity of butterflies in a locality serves as the best bio-indicators of impact of climate change and it will be of great use to monitor the butterflies on a long term basis. Monitoring involves identification and reporting of butterflies in different districts of the state. EMPRI has initiated a Butterfly Monitoring Programme for the whole state of Karnataka.

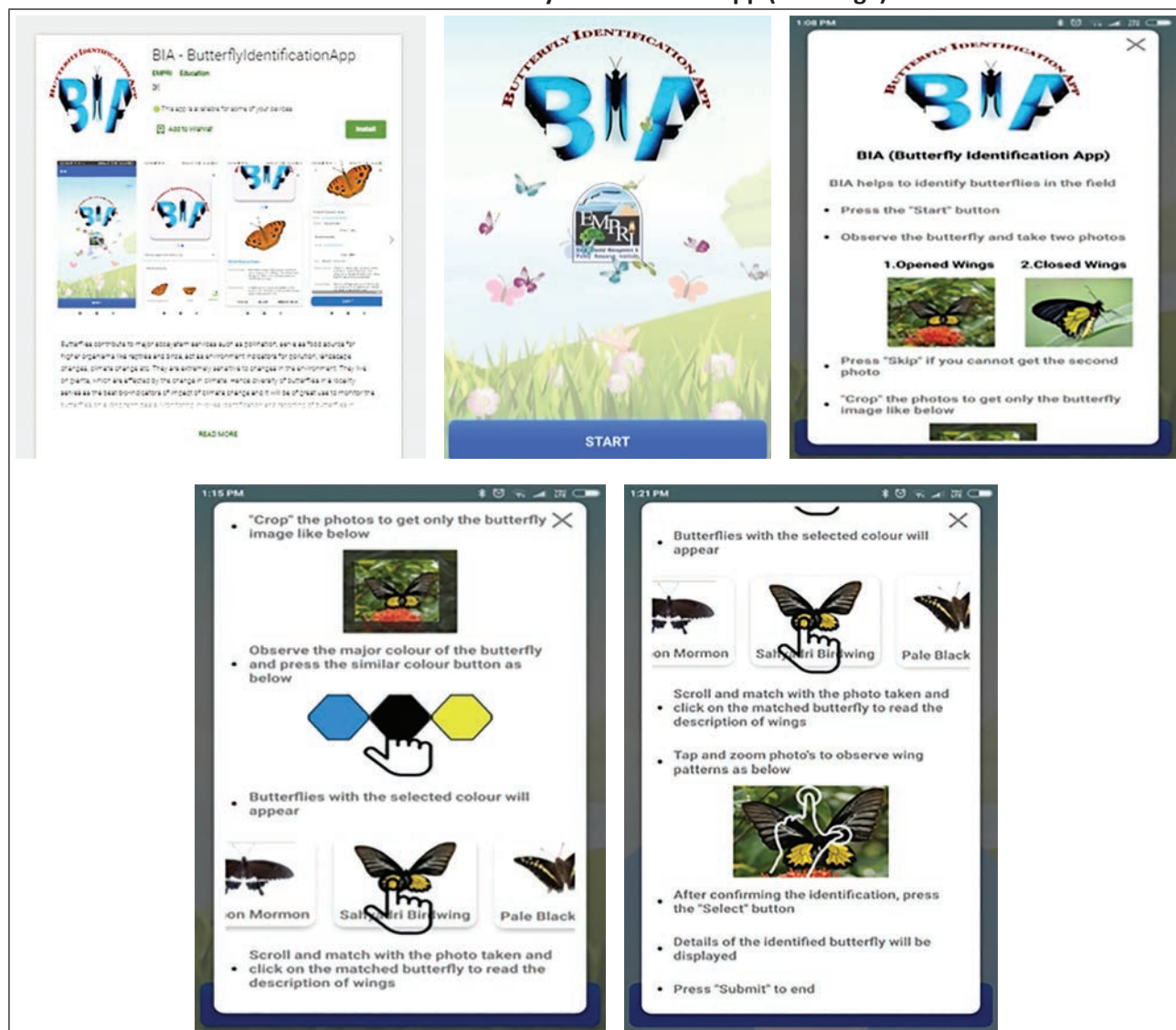
As the butterflies are with diverse color patterns, identity can be mistaken. Hence a color based identification tool, a mobile APP (Pathanga) has been developed to enable the field identification of butterflies. This can be used by any common man in his mobile phone. Continuous monitoring in specific areas can be enabled through public involvement (school children, naturalists, youths, forest departmental officials etc.)

About Butterfly Identification App (Pathanga)

In Butterfly Identification App (Pathanga), butterflies are categorized as per their major colors (black, orange, yellow, white, brown and blue). The Color button will guide you to the butterflies with the same major color on the wings. The identification submitted by the user through Pathanga will get transferred to a Dashboard. The information on butterflies across regions, seasons and years along with the climate data will help to monitor the biodiversity of butterflies and correlate with climate change.

BIA enables to take open and closed wing photos of the butterfly in the field.

How to download the Android Butterfly Identification App (Pathanga) on Your Mobile?



- Step 1: Take your android mobile and go to Play store and search for Pathanga-Butterfly Identification App
- Step 2: Click the app to download the apk file of the application
- Step 3: Once the apk file is downloaded, open the file and install it on your android phone.
- Step 4: Open the Pathanga app installed in the mobile and provide permission to access the app.
 In Pathanga, butterflies are categorized as per their major colors (black, orange, yellow, white, brown and blue) Color button will guide you to the photo of butterflies with same major color on wings. The photo taken can be zoomed and matched with the photo in Pathanga to decide about the identification
- Step 5: The confirmed identification can be submitted by pressing “SUBMIT”

3. Understanding and projecting the effect of climate change on native bee species and its implication on crop production

This study is aimed to assess the impact of climate change on native bees. Firstly, the geographic distributional maps for different bee species for the genus: *Apis*, *Halictus*, *Ceratina*, *Megachile*, *Tetragonula* based on agro-climatic zone wise for Karnataka are prepared. Secondly, foraging behaviour of bee species and its thermoregulation potential of two species namely *A. cerana indica* and *T. iridipennis* in a natural condition for two seasons were examined.

The remaining objective based works such as decadal changes time series mapping, habitat and climatic modelling and egg laying capacity of the queen under controlled experimental condition, effect of projected climate change on crop productivity for pollinator dependent crops are ongoing.

Figure depicting the variations with a) Foraging activity of *Apis cerana* b) Foraging activity of *Tetragonula iridipennis* for different bee hives maintained in a natural microclimatic niches c) Seasonal NDVI (Normalized Difference Vegetation Index) maps for three years 2019- 2021.

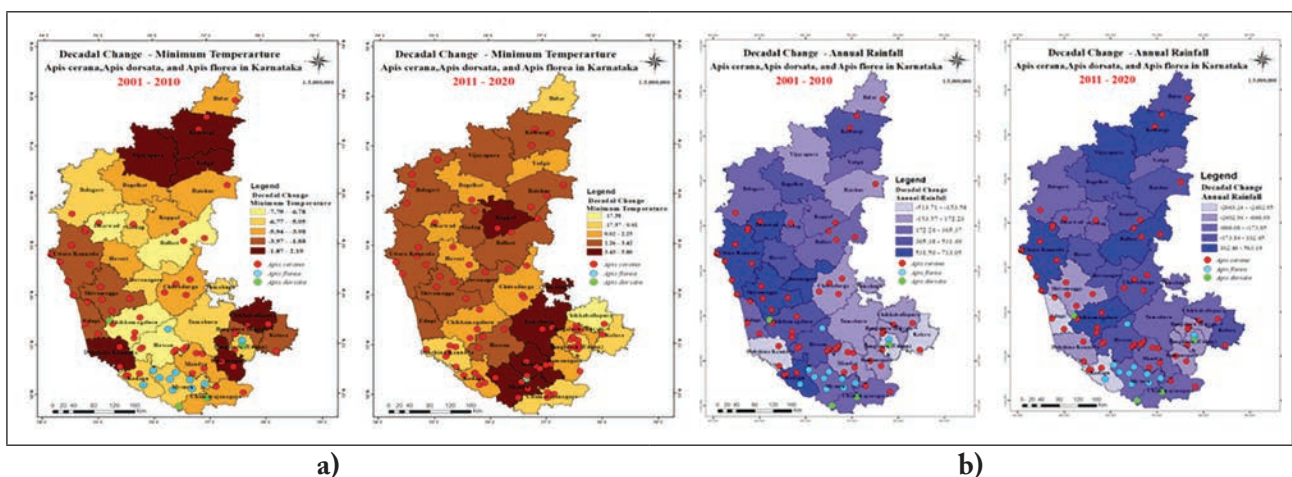
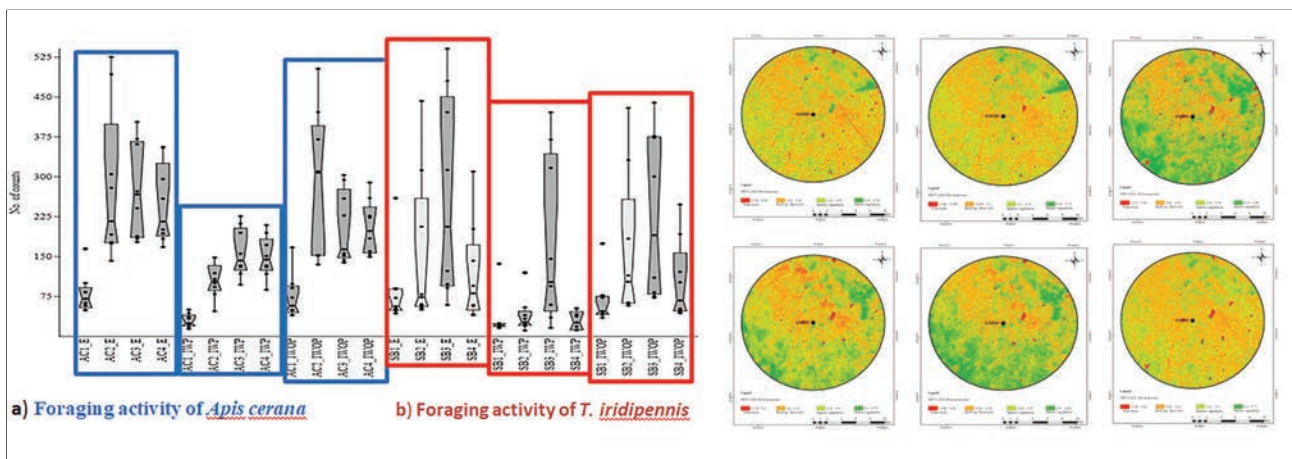


Figure depicting the a) Two decadal variations for *Apis cerana* under maximum temperature the year 2001-2010 and 2011-2020 b) two decadal variations

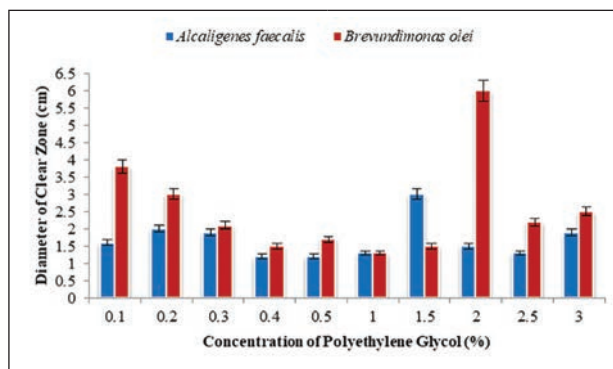
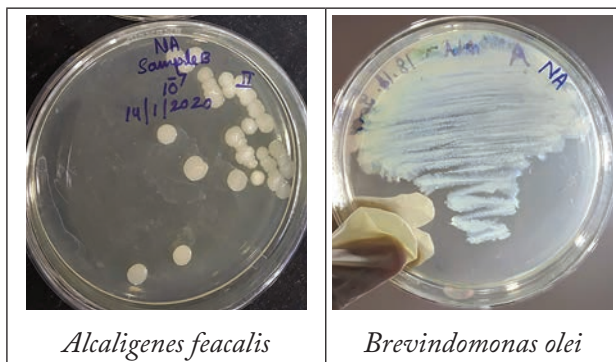
for *Apis cerana* under annual rainfall scenarios for the year 2001-2010 and 2011-2020

4. Effects of urbanization on bee communities and evaluation of ecosystem services in urban areas

The objective of the project is to assess the diversity of the bee communities under different categories of urbanization which has been carried out at different regions namely residential areas, parks and open spaces, industries, traffic and transport rich areas and public and semi-public areas to evaluate variations of bee diversity are on-going. Further to quantify and measure the effects of urban regions, pollen and bee samples are collected for analyses.

5. Studies on Plastic Degrading Microbes Isolated From Soil

The specific objective of the project is to isolate the potential microbes for plastic biodegradation. Two bacterial isolates identified as *Alcaligenes faecalis* and *Brevindomonas olei* have been screened for degradation of plastic compound (Polyethylene glycol-PEG) at different concentrations by Zone of Clearance method. After seven days of incubation, the clear zones formed in agar media ranged between 1.2cm - 6.0cm. The isolate of *B.olei* recorded maximum zone of clearance (6.0 cm) in minimal agar media substituted with 2.0% PEG, whereas *A. faecalis* formed maximum zone of clearance (3.0 cm) in 1.5% PEG added minimal agar media. The compatibility tests of the microbial cultures for the consortium studies and the Fourier-transform infrared spectroscopy (FTIR) analysis of the treated polymer to observe the changes in the functional groups are under progress.



Plastic biodegradation potential of bacterial isolates by zone of clearance method

6. Understanding Institutional Initiatives (Civic) in Solid Waste Management – A Study of Bengaluru city

The project was proposed with an intent to document the various civic initiatives in Bengaluru city across all stages of waste management (segregation, collection, transportation, treatment and disposal) with zero waste management principle in a circular economy context. The SWM initiatives documented would be mapped using GIS tool. The study would help in identifying the key issues, gaps and concerns in waste management by civic groups and best practices to be followed by aspiring civic bodies and start-up groups in the state of Karnataka.

The lists of Residents Welfare Association (RWAs) and NGO’s working on waste management issues have been shortlisted from the master list obtained from various sources. The waste management activities of twenty three RWA’s and seven NGO’s have been documented. The GPS locations have been gathered. The data on waste management by BBMP in Bengaluru city has been collected. The analysis and interpretation of the documented initiatives is under progress.

7. A study of heavy metal concentration in vegetable crops irrigated by different sources of water

The objectives of the study were to estimate

the concentration of heavy metals in vegetable samples obtained from various sources. Ten vegetable samples were obtained from retail and local markets, HOPCOMS and organic stores. The sampling, pre-processing and the analysis of heavy metals concentrations (Fe, Cu, Cr, Cd, Ni, Zn, Mg and Pb) were done in duplicates in all the samples. The drafting of project completion report is under progress.

8. Exploration of Microalgae for Carbon Capture, Biomass Production and Bioremediation

The aim of the project is to utilise the waste algal species from different water sources and to characterize microalgae for their efficiency in fixation of carbon dioxide and biomass production. A total of six algae have been isolated from lake water and domestic water samples. To culture the microalgae for better biomass production, four different media (BG-11 media, Algae culture agar, Bold Basal media and Soil Extract Agar) were used and found the algae culture agar was best utilized for the growth of the microalgae among other media. The standardization of liquid media for culturing microalgae is under progress.

9. Estimation of Photosynthetic Potential of Dominant Mangrove Species in Different Osmotic Environment

This study is undertaken in Udupi district with the main objective to estimate the photosynthetic potential of dominant mangrove species and to understand the effect of osmotic environment on the adaptability of species. Towards this objective, initial field visits were undertaken for water sampling and photosynthetic potential of dominant mangrove species in 7 locations (Kodi 1, Kodi 2, Kodi 3,

Tarapathi 1, Kergaal, Hollarathotha, Mattu) of Udupi district. During the consequent field visits, salinity estimates of the waters (23 points) were taken using a salinometer and classified into low, medium and high saline waters. The photosynthetic potential of some dominant mangrove species in these different saline gradients (12 locations chosen) were estimated using an infrared gas analyser (IRGA). Water sampling was done in 10 locations (Kodi 1, Kodi 2, Kodi 3, Tarapathi 1, Kergaal, Hollarathotha, Brahmavara, Paramkudru 1, Paramkudru 2, Gangoli Kodi), 7 from previous locations & 3 new locations for the analysis of various physico-chemical parameters. Mangrove leaf samples were collected from the species that were analysed for the photosynthetic potential using IRGA. The leaf samples were used for the estimation of proline and C.H.N.S content. Field visits will be undertaken during May 2022 for salinity estimation, water sampling, and leaf collection. The additional data obtained will provide us a better understanding on the adaptability of the mangrove species to salinity and physio-chemical parameters.

10. Exploring the potential of terrestrial indoor plants for moderating the effect of climatic conditions in urban areas

The objectives of the project is to quantify the photosynthetic potential and determine the diversity of functional variability for specific leaf area, moisture content, leaf chlorophyll content, biomass ratio and CHNS for biomass estimation were undertaken by screening 37 potted indoor plant species. *Syngonium podophyllum*, *Clivia minata*, *Piper bredmeyrei*, *Polyscias scutellaria* and *Yucca elephantipes* plant species showed higher CO₂ assimilation rates. Further experiments to understand the efficiency and influence of surrounding condition on the carbon assimilation of these specific indoor plants are underway.



a) *Syngonium podophyllum*



c) *Polyscias scutellaria* and



b) *Piper bredmeyrei*



d) *Clivia minata*

Table: 1 Depicting the net photosynthetic assimilation, specific leaf area, Carbon and Nitrogen content of indoor plants

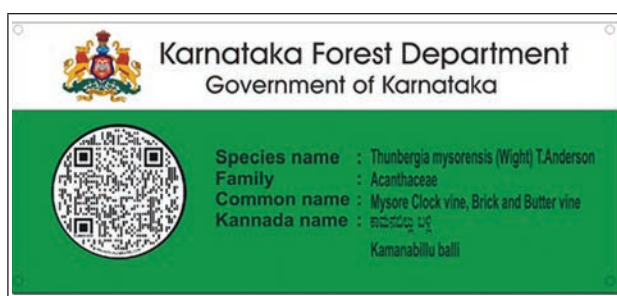
Indoor plants	Assimilation ($\mu\text{mol CO}_2 \text{ m}^{-2}\text{s}^{-1}$)	Specific leaf area (cm^2)	Carbon (%)	Nitrogen (%)
<i>Syngonium podophyllum</i>	14.79	118.54	39.71	3.07
<i>Clivia minata</i>	12.69	25.03	41.04	1.63
<i>Piper bredmeyrei</i>	20.20	57.19	37.09	2.36
<i>Polyscias scutellaria</i>	12.65	108.48	39.81	2.31
<i>Yucca elephantipes</i>	20.36	4.61	43.57	1.08

11. Understanding anthropogenic impact on bee pollinators: A study under different cultivation practices and changing land-use pattern

The objectives of the project were to assess the bee species diversity, abundance, species richness and density of bee species, amount of different types of chemicals utilized, difference in the crop productivity and nutrient quality of the soil and climatic variability for inorganic and organic cultivation practicing farmers were measured by visiting twenty-four cucumber plots of farmers for two seasons in and around Bangalore during the year 2020-21.

The insecticides and fungicides sprayed at the farmer field were collected and subjected to lab analyses. In this context, experiments such as choice assays, oral and contact percent mortality test were performed and completed for estimating the pollinator risk assessments and toxicity level. The semi-field experiment and enzyme based assay under lab conditions to assess the physiologic effects from specific insecticides are on-going.

12. Identification and Quick Response (QR) coding of trees of Kodimanchenahalli tree park



QR coding of tree species is a new way of disseminating knowledge via the digital platform. The trees of the Kodimanchenahalli park were identified and a database was done comprising of the Scientific name, Family, Common name, local name and medicinal uses. Photographs of leaves, flowers, fruits and bark were taken for easy identification and for incorporating these in the QR code database.

The public who come to the park will scan the labelled tree with their mobile phone camera. This will lead them to the details of that particular tree and its medicinal uses. The QR code is currently generated with the help of online platform, as a future programme undertaking, the latitude and longitude (Map) shall also be incorporated to provide unique identity to the tree/plant species. The QR code plate is designed and generated; the respective detailed information regarding the species was examined thoroughly by the Research Associates involved in this project. This pilot project is hoped to lay more such opportunities to identify multiple tree parks throughout the state of Karnataka. This project was taken up for the easy identification of trees by the public. A total of 100 trees were identified and generation of QR codes are under progress.

13. Impact of Climate Change on Population under Poverty for Karnataka

Climate change mainly impacts poverty via different routes i.e., agriculture, health, and market (World Bank, 2014). Understanding this channel of impact will help in identifying the factors impacting the poor population. The study explains how climate change affects poor communities' health, livelihood, and other factors, thereby understanding the vulnerability of individual districts (community/people) to climate change and it is based on secondary data collection and analysis with respect to agriculture, health and market indicators. The poverty indicators have been identified and Gini coefficient to measure inequality in poverty status across districts of Karnataka has been calculated. In addition, district wise multidimensional poverty index and climate vulnerability index have been derived and correlation and regression analysis have been carried out. These indices help in prioritizing the districts that require immediate action against poverty. Data analysis, data interpretation and formulating the results, and report writing will be carried out.

14. District wise policy brief on vulnerability, adaptation and mitigation strategies for Karnataka

The objective of the project is to prepare policy brief for each district of Karnataka on the impact of 'climate change on Agriculture, Health, Water resource and forest sector, including adaptation and mitigation strategies'. Secondary data collection is in progress. Climate change Vulnerability indices for Agriculture, Health, Water Resources and Forest will be either derived from previous studies or calculated. The indices will be used to rank the districts for climate change vulnerability. Based on the ranking, adaptation and mitigation plans for individual districts will be prepared and included in the policy briefs.

C. New Projects initiated in 2021-22

1. Climate Risk Assessment in Agriculture in Different Agro climatic Zones of Karnataka.

The study is designed to identify and assess the risk factors in the agriculture sector in different agro-climatic zones of Karnataka and to categorize the districts based on risk index. Risk is a result of the interaction of vulnerability, exposure, and hazard. Identification of the indicators for vulnerability are classified into biophysical(6), farming(24), socio-economic and livelihood(8) and physical capital(6), Exposure(4) and Hazard(5) indicators are shortlisted. Secondary data on these indicators has been collected from published sources. Assigning weights to the indicators using Principal Component Analysis (PCA) is under progress.

2. Mapping Climate Change Vulnerability: An Assessment of water resource sector across different districts of Karnataka

The study deals with the vulnerability assessment of water resources sector. The methodological framework considered in the project was based on the guidelines of the Fifth Assessment Report of Intergovernmental Panel on Climate

Change (IPCC, 2014). The Tier 1 approach (top-down approach) based on secondary data was adopted for the study. Based on the availability of secondary data from the departments, twenty indicators were identified and the functional relationship between the indicators and vulnerability were assessed. The data were then subjected to normalization and aggregation followed by assigning weights to the indicators, calculation of vulnerability index (VI) and representation through ranking. The vulnerability index and ranking of districts were depicted using Arch GIS maps. Drivers of vulnerability for each of the districts were identified and percentage contribution of drivers to vulnerability was estimated.

3. Impact of Climate change on Agriculture and Horticulture crops production and Livelihoods in Karnataka

- **Budget and timeline:** Total Budget is Rs.32,00,000/-, Time period is Three Years

Sl. No.	Budget head	Total Budget (in rupees.)
1	Human resource	
	a) Salary of Project Associate (1 in no.)	9,00,000/-
	b) 1.01 % HR	9,090/-
	c) 18% GST on Salary	1,63,636/-
	Total	10,72,726/-
2	Travelling Cost (field visit, Data collection and analysis)	8,00,000/-
3	Stationary, Computer accessories and other gadgets	7,50,000/-
4	Miscellaneous	5,77,247/-
	Grand total	32,00,000/-

Rs. 32,00,000/- (Rupees thirty two lakh only)
(Inclusive of 18% GST + HR Commission 1.01%)

- **Brief description of the project:** Clear impacts from climate change are being witnessed in agriculture and horticulture sectors. Impacts

are both positive as well as negative. They are, however, dependent on latitude, altitude and type of crop. There have been noticeable impacts on plant production, insect, disease and weed dynamics, soil properties and microbial compositions in farming systems. According to IPCC 2007, a temperature change in tropical areas has in general had a negative impact on food production and it is estimated that food production within South Asia will decrease by about 30% by 2050. The study area were selected based on the studies (eg. K. V. Raju, 2017) carried out on vulnerability of agricultural and horticultural crops in Karnataka by earlier research workers and similarly the crops in each district of Horticulture and Agriculture were selected based on the area cultivated in the districts following the data base provided by Directorate of Economics and Statistics (<https://des.karnataka.gov.in>).

- **Study Area:** Southern Transition zone-Shimoga, Hilly Zone - Chikmagalur, Hilly Zone- Kodagu, Eastern Dry Zone- Ramanagara, Eastern Dry Zone-Chikkaballapur, Eastern Dry Zone- Bangalore (R), Eastern Dry Zone- Kolar.
- **Work progress:** The review of literature, formulation and development of formats and their field validation, formulation and development of questionnaire and its validation was completed. The secondary data on climatic parameters (temperature, rainfall and humidity, from 1980-2020) was retrieved from Department of Agrometeorology, UAS, GKVK, Bangalore. Developed the road map for the project for three years. Agriculture Vulnerability Index will be used to assess the overall impact of climate change on crop production. The study area comprising seven agriculture vulnerability zones, the study area and crops (Agriculture and Horticulture crops each) have also been selected after interacting

with scientists at UAS, GKVK, IIHR-Bangalore and officials of Agriculture and Horticulture Departments. A review paper on the topic, "Impact of climate change on soil and soil health" is under progress. Visits to farmers fields in Chikmagalur, Hassan and Kolar on a trial basis for validation of questionnaires and formats have been completed. Parameters for Agriculture Vulnerability Index and Soil Quality Index have been chosen and efforts are on to use them in statistical analysis.

- Following works undertaken
 - o Correlation analysis of climatic parameters with agricultural vulnerability index
 - o Trend analysis and shifting pattern.
 - o Field data from farmers'fields
 - o Cultivation and cost of crop production (secondary data).

I. Coordination With Government Departments For Developing Projects Under National/International Funding

Monitoring the NAFCC Project undertaken by AH&VS

A project entitled, "Conservation and Management of Indigenous varieties of livestock (Cattle and Sheep) in the Wake of Climate Change in Karnataka" sanctioned in 2016 for Rs.24, 21,52,632/- by MoEF & CC, New Delhi is being undertaken by Karnataka livestock Development Agency (KLDA), Animal Husbandry and Veterinary Services (AH&VS). A total amount of Rs 11.75 Crores has been utilized by the implementing agencies as on January, 2022. Completed survey and identification of Elite cows and KLDA has procured 200 Malnad Gidda cows. Identified the variants associated with certain economically important traits. Whole genome sequencing of Amritmahal, Hallikar, Malnad Gidda and deoni breeds and analysis of Amritmahal is under progress.

II. Organisation of Workshop/Webinar

1. A five-day training course on “**Environmental Impact Assessment: Need and Methods for Assessment**” was conducted by EMPRI to IFS officers during 6th – 10th December, 2021 at Bangalore.
2. A one-day webinar/workshop was organised on **Green Budget: Possibilities and Practices** on 25 February 2022 by EMPRI. The speakers from various prestigious institutions in the country have delivered talks to the participants from research and academic institutions and different stakeholder departments of government of Karnataka. The objective of the webinar is to promote green budgeting for development through public finance. There were five talks presented by the distinguished speakers Prof. Ravindranath, IISc, Dr. S P Singh, IIFM, Dr. Shailly Kedia, TERI, Dr. Krishna Raj, ISEC and Dr. M K Ramesh, NLSIU. Dr. Jagmohan Sharma, IFS, Director General, EMPRI, discussed on the green budget roadmap for the State of Karnataka.
3. A virtual international webinar was conducted on **Short-lived climate pollutants (SLCP) emissions in India: Sources and Quantity** on 4 March 2022 by EMPRI. The objectives of organising the webinar were to enhance the expertise, explore recent development in SLCP emission quantification and collaborate with the experts. The eminent speakers were Dr Johan C.I. Kuylenstierna, Stockholm Environment Institute, United Kingdom, Dr Govindasamy Bala, IISc, Dr Tejaswini ME, EMPRI, Dr Eleni Michalopoulou, Stockholm Environment Institute, United Kingdom and Dr Pritha Chatterjee, IIT Hyderabad. Dr. Jagmohan Sharma, IFS, Director General, EMPRI gave the conclusion remarks highlighting the pressing need to address work towards estimation and mitigation of SLCP

emission and the importance of nationwide collaboration in achieving such a fleet.

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II. Participation in Conferences and Workshops

1. Dr. Hema N presented a talk on **Climate Change in Karnataka** in HSS-CEE Knowledge Partner Symposium on Karnataka State Action Plan on Climate Change-From Understanding to Action on 11.11. 2021 at Ashraya International Hotel, Bangalore.
2. Participated in HSS-CEE State Level Round table on **The role of Sub-national Policy in dealing with Climate Change - Learnings from the implementation of Karnataka State Action Plan on Climate Change (KSAPCC)** on 07.12.2021 at Zion Hotel, Bangalore.
3. Dr. Hema N presented a talk on **Climate Change in Karnataka – Impacts and Challenges** in CSD Partners Meet on 17.12. 2021 at Hotel Royal Orchid, Bangalore.

IV. Courses Attended

- Dr. Anitha S, Research Scientist, CCC, EMPRI has attended the online training on **Climate Resilient Production Systems and Promotion of Agri-Preneurship** conducted by NIRDPR-NERC, Guwahati from 19.07.2021 to 23.07.2021

V. Internship Programme for Post-Graduate Students

Three internship project works have been carried out by MSc students of Administrative Management College (AMC), Bangalore under the guidance of Dr. B. Saritha, Senior Consultant, Centre for Climate Change, EMPRI, for the partial fulfilment for the award of Master of Science in Biotechnology from Bangalore University during the years 2021-22 and 2022-23.

1. Screening of Bacteria for Plastic Biodegradation Potential Using Polyethylene Glycol Under In-Vitro Conditions by Ms. Jeevithashree B, Ms. Rosheena Maria Panicker and Mr. Muthuraja. (Completed) [org/10.9734/mrji/2021/v31i630324](https://doi.org/10.9734/mrji/2021/v31i630324). NAAS Rating:4.65
2. Studies on Biodegradation Potential of Microbial Consortium under In Vitro Conditions by Mr. Shashikiran, Ms. Bhavani and Mr. Kishore. (Ongoing)
3. Analysis of Biodegraded plastic polymer using Fourier Transform Infra-Red (FTIR) Spectroscopy by Ms. Megha, Ms. Kavya and Ms. Neeraja. (Ongoing)
4. Ritu Kakkar, K. H. Vinaya Kumar, O. K. Remadevi, M. Manjunatha, B. Saritha, Balasubramanya Sharma, M. Kiranraddi, H. S. Dattaraja, H. S. Suresh (2021). Patterns of woody species diversity and structure in Thalewood House permanent preservation plot in Bannerghatta National Park, Bangalore, India. *Tropical Ecology*. <https://doi.org/10.1007/s42965-021-00169-y>. IF:1.137
5. Eregowda, T., Chatterjee, P., and Pawar, D.S. (2021). Impact of lockdown associated with COVID19 on air quality and emissions from transportation sector: case study in selected Indian metropolitan cities. *Environment Systems and Decisions*. 41(3):401-412. IF:2.41.

VI. Research Publications

1. Saritha, B., Remadevi, O.K. (2022). Role of Microbes and their Enzymes in Biodegradation of Plastic Waste. *Innovations in Microbiology and Biotechnology*. 4: 24–39. <https://doi.org/10.9734/bpi/imb/v4/15134D>.
2. Debasis Mitra, Boya Saritha, Edappayil Janeeshma, Poonam Gusain, Bahman Khoshru, Fatma A. Abo Nouh, Anju Rani, Adeyemi N. Olatunbosun, Janki Ruparelia, Aniruddh Rabari, Lyda P. Mosquera-Sánchez, Rittick Mondal, Devvret Verma, Periyasamy Panneerselvam, Pradeep K. Das Mohapatra, Guerra Sierra B.E (2022). Arbuscular mycorrhizal fungal association boosted the arsenic resistance in crops with special responsiveness to rice plant, *Environmental and Experimental Botany*, 193, 104681, ISSN 0098-8472, <https://doi.org/10.1016/j.envexpbot.2021.104681>. IF:5.545
3. Saritha, B., Sindgi, S.A. and Remadevi, O.K. (2021). Plastic Degrading Microbes: A Review. *Microbiology Research Journal International*, 31(6), 22-28. <https://doi.org/10.9734/mrji/2021/v31i630324>.

2.2.3. Centre for Forestry Ecology and Wildlife

Centre for Forestry Ecology and Wildlife aims to become a Centre of excellence by way of improving and sustaining healthy living conditions for human population through conservation of forests, biodiversity, protection of environment, soil water etc. through research studies, policy research and capacity building. To become a Centre of research and developing capacity building in the field of forestry ecology and wildlife, the forest service restoration management and protection of forests of Karnataka state and forest ecosystem to sustain our natural resources.

A) Completed Project

1. **Evaluation of the impacts of increased timing of the operation of the Main pipe Conveyor from Nandihalli yard to JSW Plant on wildlife**

Completed short term project entitled “**Evaluation of the impacts of increased timing of the operation of the Main pipe Conveyor from Nandihalli yard to JSW Plant on wildlife**” funded by JSW with the sanctioned budget of 84,31,500/- and the duration of the project was 04 months from 2021 to 2022 and report has been submitted to Karnataka Forest Department.

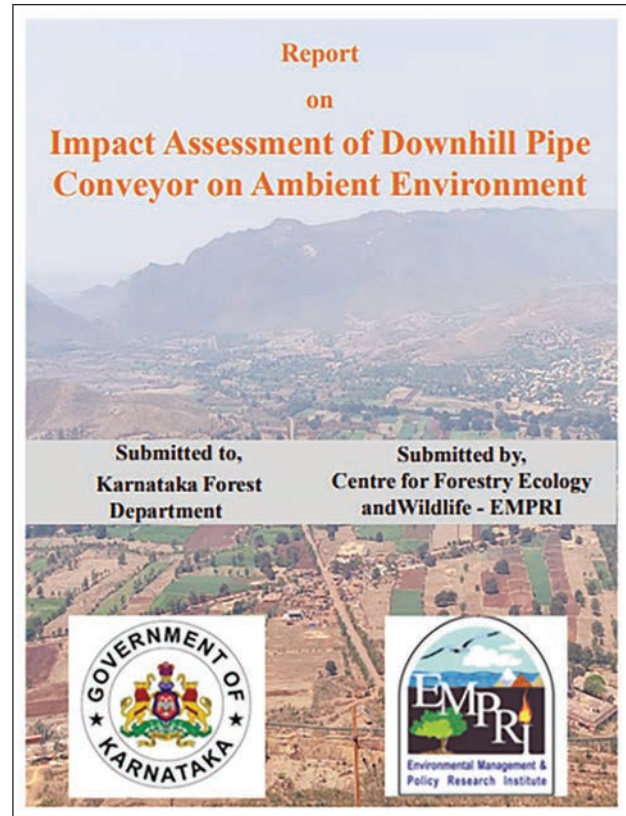
The study documents the persistence of high biodiversity in the target habitat that includes 217 species of plants, 192 species of arthropods, 13 species of amphibians, 26 species of reptiles, 125 species of birds, 33 species of mammals. Out of the total 605 species, 23 species are of high important species (Schedule-I) in Indian Wildlife (Protection) Act 1972 and 16 species are of highly threatened (Vulnerable and Near Threatened) species as listed by IUCN Red List. This documentation of high biodiversity demonstrates the importance of the area as an important habitat. Conclusion: Since the study was conducted for short term, the conclusion was to carry out similar impact studies on long term basis. The project report has been submitted to Karnataka Forest Department on 30th September 2021.

B) Ongoing Projects

1. Impact Assessment of Downhill Pipe Conveyor on Ambient Environment

Karnataka Forest Department entrusted the task of undertaking “**Impact Assessment of Downhill Pipe Conveyor on Ambient Environment**”, Ballari district to ‘**Environmental Management and Policy Research Institute**’ for a period of five years, with the sanctioned budget of 4,49,73,421/- by M/s. JSW Steel Ltd., and specified the Terms of References (ToRs) that are to be assessed. The study area comprises of three Downhill Pipe Conveyors i.e., Devadari, Rama and Tunga & Bhadra DHPC that connect to Main Pipe Conveyor. Seasonal monitoring of environmental attributes (Air, Water, Soil and Noise) , LULC studies, Inventorisation of water bodies and socio

economic survey of the villages is being carried out. The details of seasonal monitoring conducted in 2021-22 are as detailed below:



1. **Summer season:** Sampling was carried out during the month of April to July 2021.
2. **Post monsoon:** Sampling was carried out during the month of October to November 2021.
3. **Winter season:** Sampling was carried out during the month of February to March 2022. Seasonal reports are prepared and annual report will be drafted and submitted to Karnataka Forest department in May 2022.

2. Status of Floristic diversity, regeneration physical and chemical properties of the soil in fire affected areas of different vegetation types in Karnataka

The project is undertaken by EMPRI funds at a cost of Rupees 10 Lakhs with a timeline of 1 year.

The main objective is to understand the regeneration status of single fire event in the dynamics of tree species diversity, stand structure in different vegetation types viz. scrub, dry deciduous and moist deciduous forests of the state and to study the impacts of a wildfire on physical properties of soil including soil bulk density, porosity, and capillary moisture and chemical properties of soil such as soil carbon nitrogen, phosphorous and potassium.

This comprised of collection of available data on forest fire from ICT cell, Karnataka Forest Department. Field visits were undertaken shortlisting the fire points based on types of forests of Karnataka. 5 forest circles were selected for the current study viz., (1) **Bengaluru** (2) **Hassan** circle (3) **Mysore** (4) **Kodagu** and (5) **Canara**, In which 38 ranges were visited consisting of dry deciduous, Mixed dry deciduous, Scrub, Semi evergreen, Evergreen, Moist deciduous, Shola forests respectively. (Table.1)

In each of the vegetation types outside the protected areas, a sampling intensity of 0.01% was adopted for the vegetation study (regeneration). Based on the sampling intensity, 0.04 ha square plots were laid randomly in all the fire burnt patches, A control sample plot of 0.04 ha was laid where ever necessary in the un-burnt patch, and then soil samples were collected using soil auger instrument from the upper 30 cm at 4 randomly located points in each plot. Soil and Data analysis is in progress for the final report

Table.1. List of selected ranges based on fire intensity

Forest type	Ranges
Mixed dry deciduous and scrub	Pandavapura
	Channarayapatna
	Holenarsipura
	Hassan
	Alur
	Belur
	Arkalgud
	Arsikere
	Madhugiri
	Chikkanayakanahalli
	Kunigal
Dry deciduous	Periyapattana
	Srirangapatna
	Yelhanka
	Dibbagiri
	Anekal
	Kaggalipura
	Doddaballapura
	Devanahalli
	Hosakote
	Nelamangala
	Gudibande
Moist deciduous	Bagepalli
	Madikeri
	Somwarpet
	Virajpet
	Dandeli
Semi evergreen	Hunsur
	Antharasanthe
	Haliyal
	Sirsi
Evergreen	Yellapura
	Ankola
Scrub	Mundagod
	Bhatkal
Shola	Karwar
	Ramanagara
	Kanakapura
	Sakleshpura

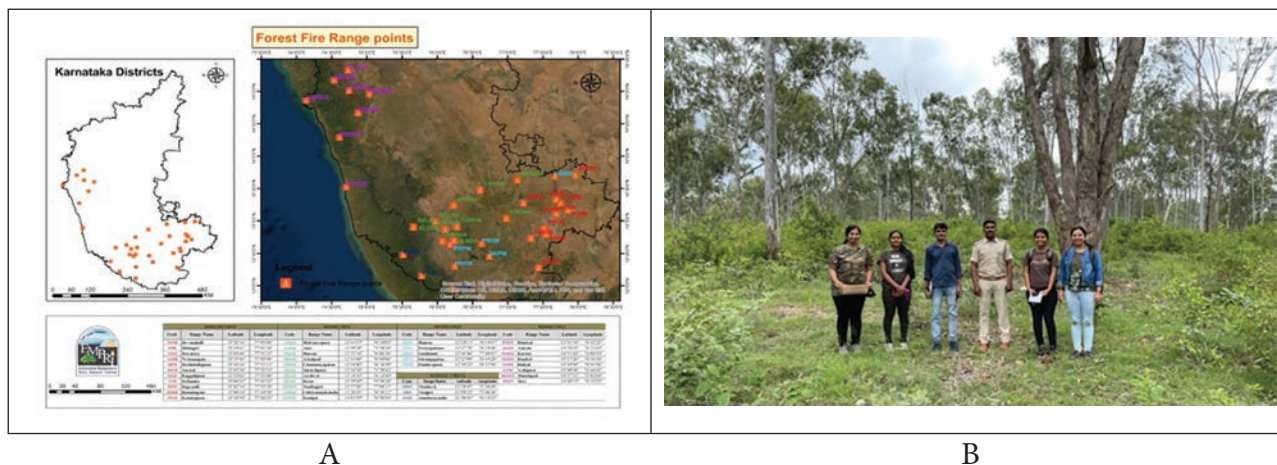


Figure. A.Geographical view of researched fire points (B) Research team at Field

3. Study on the status of Sandalwood plantations of Karnataka

The Project entitled “Study on the status of Sandalwood plantations of Karnataka” was funded by Karnataka Forest Department with the total sanctioned budget of 16 lakhs and the duration of the project was eleven months from June 2021 to April 2022. The main objective of the project was to check the status of Sandalwood plantations and to prepare a compendium of the sandalwood plantations, which are being raised and protected by KFD and the sandalwood plantation raised in private lands. The study was on the sandalwood plantations raised in the private lands and KFD raised plantations under

Sirichandanavana and CAMPA schemes with the approved Terms of references (TORs). There were 70 sandalwood plantations (2899ha) all over Karnataka (55 Sirichandanavana and 15 CAMPA) which includes all the 13 forest circles i.e., Bellari, Belagavi, Bengaluru, Chamarajanagara, Chikkamagaluru, Dharwad, Hassan, Kalaburgi, Kanara, Kodagu, Mangaluru, Mysuru and Shivamogga.

As per the ToRs morphological surveys was done by laying sample plots with minimum of 1 plot per 10ha in the plantations by taking up 1% sampling of 0.1ha (31.62m ×31.62m). All the sandalwood plants within the study area were



Figure. Measuring heartwood and sapwood in Depot (B) Research team with the forest officials (C) Regeneration of *Santalum album* (D) Sandalwood logs in Mysuru Depot

enumerated by recording growth measurements like height, girth and diseases if any on the sandalwood plants. Regeneration sample plots (1m×1m) were also plotted to check the regeneration status.

Private plantations in Chitradurga, Hosadurga, Kolar, Kollegala and sandalwood depot in Mysuru are visited and data has been collected through a questionnaire. At present drawing inferences and generation of the final report is in progress from the analysis of the data collected during the visit of the plantations.

4. EST-SSR Markers Development Based on RNA-Seq Data and its Application for Genetic Diversity of Indian Sandalwood (*Santalum album* L.)

Indian Sandalwood (*Santalum album*) is a Tropical-Evergreen-Aromatic- Forest tree with the most resourcefull tree found in Karnataka. It is economically valued for heartwood and heartwood-derived essential oil. Human effectuated overexploitation of Wild Genetic Resources (WGR) for commercial purposes has led to a sharp decline in the sandalwood population and germplasm in recent decades. genetic diversity studies help us in ecosystem recovery after hazards and extreme events, ensure climate stability, food security, medicine, healthy soil, timber, etc. The current project would help in identification and conservation of superior sandalwood population for seed collection and for further multiplication. This project is an EMPRI funded project with a budget of 36,86,400. The project has been designed to be completed in a timeline of 2 years

The current project aims at the development and validation of such gene-specific EST-SSR markers, using available RNA-seq data, previously assembled and annotated, for the estimation of genetic diversity within the species and population genetic structure for further genetic improvement and tree breeding programs in view of sandalwood

germplasm conservation. The objectives include (1) Development and characterization of EST-SSR markers in sandalwood (*Santalum album* L.), (2) Validation of the selected SSR markers using elite accessions of sandalwood (*Santalum album* L.) and (3) Estimation of genetic variability and population genetic structure in sandalwood population in Karnataka state. For the present project a detailed review of literature was conducted in October until November and Essential oil yielding varieties genes were selected. Identification of oil specific EST-SSR markers from the available RNA-seq sequence (SRA Number) 1,41,781 transcripts sequences from the previously annotated and assembled raw transcriptome data was completed. Total 100 numbers of primers were selected and synthesised. Review Paper first draft on 'EST-SSR Marker Development and their Application in Genetic Diversity studies' has been submitted and is expected to complete by the end of the sixth month of the start date.

5. On the strategies for conservation of Estuaries in coastal Karnataka in the context of climate change

The estuaries are one of the critical regions of the world. It comprises only 8% of the total area of the ocean. Estuaries and near shore oceanic area accounted for 50% of the world fisheries harvest. Furthermore, its aesthetic and recreational worth of these coastal ecosystems could not be measured in terms of money. Contaminants enter estuarine and marine waters via, several key pathways specifically direct pipeline discharges from coastal industries and communities, discharges and dumping from anthropogenic activities, riverine input and run off from land. The most common anthropogenic waste disposed in the coastal zone is untreated industrial affluent and municipal waste in the form of sewage. So to understand the status of estuaries of coastal Karnataka, the study entitled "**On the strategies for conservation of Estuaries in coastal Karnataka in the context of climate change**" has been undertaken and funded by EMPRI, Total sanctioned amount for the project is 47,36,273/-

The project is to study the biophysical status of estuaries which includes land use and land cover detection, three seasonal sampling and analysis of the water, air and soil quality, biodiversity, to document the threats faced by the estuaries due to anthropogenic activities, to conserve the coastal ecosystems with special reference to mangroves, molluscs and sea turtles and to evolve the strategies for conservation of the critical estuaries.

For the present study ten major estuaries in Uttara Kannada, Udipi and Dakshina Kannada districts of coastal Karnataka are selected. All the estuaries were visited and GPS points were taken at the mouth of the estuary for land use and land cover detection. One seasonal water, soil and air monitored sample were collected and analyzed and reports were submitted. At present second seasonal sampling of water, soil and air monitoring is under process.



Figure 3. Mrs. Ritu Kakkar IFS, PCCF and DG(I/C) of EMPRI with estuary research team at Aghanashini Estuary, Uttara Kannada



Figure 4. Nandhini – Shambhavi Estuary, Dakshina Kannada

6. Development of DNA Barcoding System for the Efficient and Accurate identification of Threatened and Endangered Forest species of Karnataka

The current project aims for development of DNA barcoding method to identify the species of plants that would greatly contribute to distinguish legally from adulterated plant species. Therefore, DNA barcoding has been anticipated as a reliable technique for plant species identification that can ensure where the tree harvested and traded is one and the same species. The availability of DNA barcodes for increasing numbers of important plant species allows rapid and accurate species identification. This study would develop database of threatened Forest plants (tree, shrubs and herbs) of Karnataka. Rs.31,31,152/- is sanctioned by EMPRI for the project duration of 1 year (October 2021-September 2022).

The objectives include (1) to establish the DNA library of threatened forest trees/plants at species level (2) To develop a DNA barcodes of selected threatened forest trees/plants by using multi-locus approach system (3) To develop a database reader/scanner to identify the authentication of forest trees/plants.

For the present study final list of 60 threatened and endangered plant species of Karnataka is prepared based on the literatures and DNA barcode details for these plant species were also carried out. Out of 60 species, samples of 21 localities 21 species samples have been collected for DNA isolation and herbarium files from various nurseries and ashrams like GKVK Bangalore Campus, Doresanipalya Forest Campus, Ramakrishna Mission Shivanahalli Ashram Plantations and FRLHT TDU Nursery, Bangalore. Seventeen DNA Barcoding Primers have been finalized and synthesized for generation of DNA Barcoding. Drafts of review paper on “Assessing DNA barcode efficiency of endangered and threatened species in Karnataka” has been completed.

7. Assessment of the regeneration status of woody species of moist deciduous forest type of Western Ghats, Karnataka

The project “Assessment of the regeneration status of woody species of moist deciduous forest type of Western Ghats, Karnataka” was undertaken by EMPRI by funding 22, 00, 000/- for the period of one year (01/10/2021 to 30/09/2022) with a key objective of determining the regeneration status of wild woody species of moist deciduous vegetation type along Western Ghats of Karnataka. The individual regeneration status helps to derive protection measures and one can know what is the reaction of individual species with regard to regeneration during these days of continuous habitat fragmentation. The threat status of many of the species in the Western Ghats is either “Not evaluated” or “as evaluated long ago” as per IUCN. Hence, our study provides more insight towards the regeneration potential at individual species level, there by our study going to become a strong base line research for its threat status estimation in the future. The study is following grid based sampling technique for the enumeration of regeneration status of woody species of moist deciduous forest type under the following objectives.

- To determine diversity, distribution and compositions of woody species along different forest circles under moist deciduous type of forests.
- To determine population stand structure of woody species.
- To determine species wise regeneration status of woody species in moist deciduous type of forests of Western Ghats, Karnataka.
- To map overall regeneration status of woody species in moist deciduous forest types of different forest circles of Karnataka along Western Ghats

Progress achieved so far (01-10-2021 to 31-03-2022)

- Sampling locations are finalised using fishnet tool of GIS to overlay 10 km grid. A grid map of study area is prepared for effective sampling. According to the map generated, eight forest circles namely, Belagavi, Chamarajanagara, Chikkamagaluru, Hassan, Kanara, Kodagu Mangaluru and Shivamogga should be sampled for the objective of the study.
- Review of literature (regarding the methodology & sampling design) and interim reports are completed.
- The sampling process is under progress in Sirsi, Hassan and Sagar *division*. Simultaneously, the data entry work is ongoing.



Figure 5. Research team in field

8. Assessment of wood availability in the state of Karnataka

The Principal Chief Conservator of Forests (Head of Forest Force), Karnataka Forest Department has entrusted Environmental Management and Policy Research Institute (EMPRI) to undertake a study on *Assessment of Wood Availability in the State of Karnataka* for a period of six months (February 2022 to August 2022). The allocated budget for the present study is Rs.17, 36,000/- (Rupees seventeen thirty six thousand only). The objectives and methodology has been specified by Karnataka Forest Department in Memorandum of Understanding (MoU).

Accordingly the project is being executed. Project team has gathered data from secondary sources like saw mill management system, e-auction, check posts, evaluation report, annual report, forest survey of India report, unlicensed industries, working plan, KSFIC, KFDC, Plywood industries and Pulpwood industries. A wood availability report prepared by other states is also taken into consideration. Statistical analysis such as linear regression analysis, projections and estimations are being done. The project report will be submitted to Karnataka Forest Department by end of July 2022.

9. “Identification and Bioecology of Fireflies (Lampyridae: Coleoptera) in seven districts of Karnataka”

Budget and timeline for three years:

Period	Cost (Rs.)
December 2021 – March 2022	6,53,051/-
2022-23	11,18,333/-
2023-24	6,36,666/-
April,2024 – November 2024	5,31,049/-
Grand total	29,39,099/-

Rs. 29,39,099 (Inclusive of HR COMMISSION 1.01% +18% GST) (Rupees twenty nine lakh thirty nine thousands ninety nine only)

• Brief description of the project:

1. To identify species of fireflies in Bengaluru urban, Bengaluru rural, Chamarajanagar, Hassan, Chikmagalur, Kodagu, and Shivamoga districts of Karnataka and record their behaviour and ecology.
2. To study and understand the bioecology of selected species in laboratory at Bengaluru.
3. To recommend measures for conservation of fireflies in Karnataka.

* **Work progress:** Critical analysis was done regarding the sampling procedures for

larvae and adults of fireflies on different substrates. Review of literature has been summarized on fireflies in India and Asia-Pacific region. Detection and identification of fireflies have been undertaken. Methods for field visits and collection of data after discussion and standardization with Dr. Lesley Ballantyne (Adjunct Professor, Charles Sturt University), Dr. Sara Lewis (Tufts University), Dr. Wan Fu (Monash University Malaysia), Dr. Sudhaharan Thankiah (Singapore), Dr. Devanshu Gupta (Scientist, ZSI), Dr. Amlan Das (University of Calcutta), Dr. Prakash Patti (Entomologist, UAS, GKVK), Dr. H.M Yeshwanth (NCBS, Bangalore), and Dr. Prabhu Ganiger (Entomologist, UAS, GKVK) have been executed.

- * A review paper on fireflies status in Asia Pacific region is in progress.
- * A review paper on fireflies status in India is in progress.
- * A pocket field guide on fireflies in India is undertaken.
- * Sampling plan, rearing in laboratory, bioecology in field, behaviour of solitary and gregarious species and information on measures for conservation are in progress.
- * A network on firefly workers in Asia-Pacific region adjunct to IUCN- International Fire flyers Network has been established.
- * An International Firefly Webinar was conducted on 22nd July 2022, and a flyer on fireflies is under publication in Kannada and English.

2.3. CENTRE FOR LABORATORY

a) Project undertaken from laboratory

- * **Impact of Air Pollution on Bengaluru Metropolitan Transport Corporation (BMTC) Crew:** The study is funded by Centre for infrastructure, Sustainable

Transportation and Urban Planning, Indian Institute of Science (IISc), Bangalore. The duration of the project was one year (Aug 2020 – July 2021), but extended up to February 2022. The draft report of the project is submitted in the month of February 2022 and awaited for the suggestions.

b) Certification: Recognition as Environment Laboratory, under the Environment (Protection) Act, 1986.

c) List of New Equipment installed

- * Obituary shaker Incubator
- * Hot Air Oven
- * Weight Box Class E 2
- * Water Purifier Type I & II
- * Stereo Zoom Microscopy
- * FTIR Analyser
- * Micro wave Digester
- * Electron Capture Detector (ECD)
- * UV- Spectrometer

d) List of projects from which the water and air samples have been received and analysed are as listed below:

- * Documentation of Yettinahole project site and assessment of cumulative impact of multiple projects in afforested land scape
- * Impact Assessment of Down Hill Pipe Conveyer on ambient environment
- * The Study of Environmental Carrying Capacity of Udipi Taluk

- * On the strategies for conservation of estuaries in coastal Karnataka in the context of climate change
- * Assessment of water bodies in Tumkur and Kolar city/ Municipal corporation area (urban & semi urban area) of Karnataka
- * Estimation of Photosynthetic Potential of Dominant Mangrove Species in different Osmotic Environment
- * Bangalore Water Supply and Sewerage Board

e) Samples analysed during the 2021-22

- * Water Laboratory-271 samples
- * Microbiology Laboratory- 238 samples
- * Soil and Sediments- 234 samples
- * Ambient Air – 1274 samples

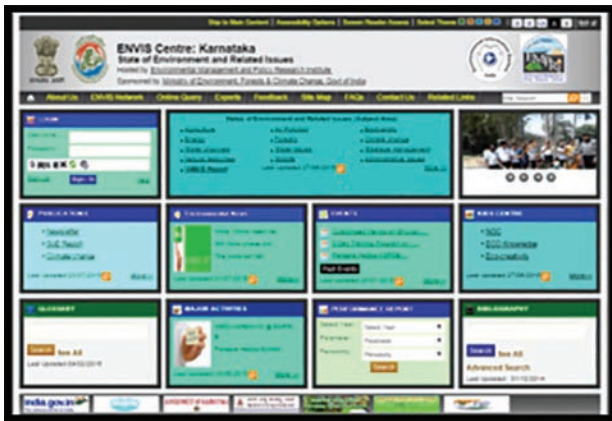
2.4. OUTREACH ACTIVITIES

2.4.1. Environmental Information System (ENVIS) Centre

The Environmental Information System (ENVIS) of Karnataka with the subject area “State of Environment and Related issues” is operating in Karnataka since December 2002. It was established as ENVIS centre on 1st January 2009 at EMPRI, Bengaluru. The ENVIS scheme was revamped in April 2017 with additional new initiatives to the previously existing one. The scheme got extended till March 2021 and further extension of one year was given till March 2022. The ENVIS centre Karnataka carried out the activities in the following areas, the details of which are as below:

a) ENVIS Website

The ENVIS centre Karnataka has a dedicated website on the National Informatics Centre (NIC) Content Management System (CMS) portal - www.karenvis.nic.in. The contents of the website are published and managed by the ENVIS centre Karnataka as per the guidelines given by Ministry of Environment Forest & Climate Change (MoEF&CC).



b) Indian State Level Basic Environmental Information Database (ISBEID)

The Indian State-Level Basic Environmental Information Database (ISBEID) is an ambitious programme of the Ministry of Environment and Forests, Government of India (GoI) in order to make environmental status easily available to researchers, students, policy makers, and the general public at large. The data have been classified into 17 modules/sectors. For all the 17 modules and sub-modules, data has been collected & uploaded for a period of 10-12 years or more. Number of entries done: 13,923 (April 2021 to March 2022).

Year	State	Module	Sub-Module	Value	Unit	Report Date
2012	Karnataka	Health	4 Submodule	1,74,814		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2013	Karnataka	Health	3 Submodule	1,74,360		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
Sub Total				4,54,795		
2014	Karnataka	Health	4 Submodule	15,72,400		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2015	Karnataka	Health	3 Submodule	1,29,070		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2016	Karnataka	Health	2 Submodule	38,30,460		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2017	Karnataka	Health	3 Submodule	1,41,740		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
Sub Total				49,74,270		
2018	Karnataka	Health	3 Submodule	1,15,820		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2019	Karnataka	Health	2 Submodule	43,49,408		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2020	Karnataka	Health	3 Submodule	1,07,280		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
2021	Karnataka	Health	4 Submodule	11,21,710		1st/2nd/3rd/4th/5th/6th/7th/8th/9th/10th/11th/12th
Sub Total				26,16,218		

c) ENVIS Newsletter 'PARISARA'

ENVIS centre has been publishing a quarterly newsletter under the name 'PARISARA'. Centre has published 63 newsletter issues till March 2022. Newsletters published in the FY: 2021-22 are as follows:

- Issue 60 on **Urbanisation**,
- Issue 61 on **Near - Threatened Species of Karnataka**,
- Issue 62 on **Environmental Disaster** and
- Issue 63 on **Inventorisation of Water bodies in the Bengaluru Metropolitan Area**



Available for download on www.karenvis.nic.in

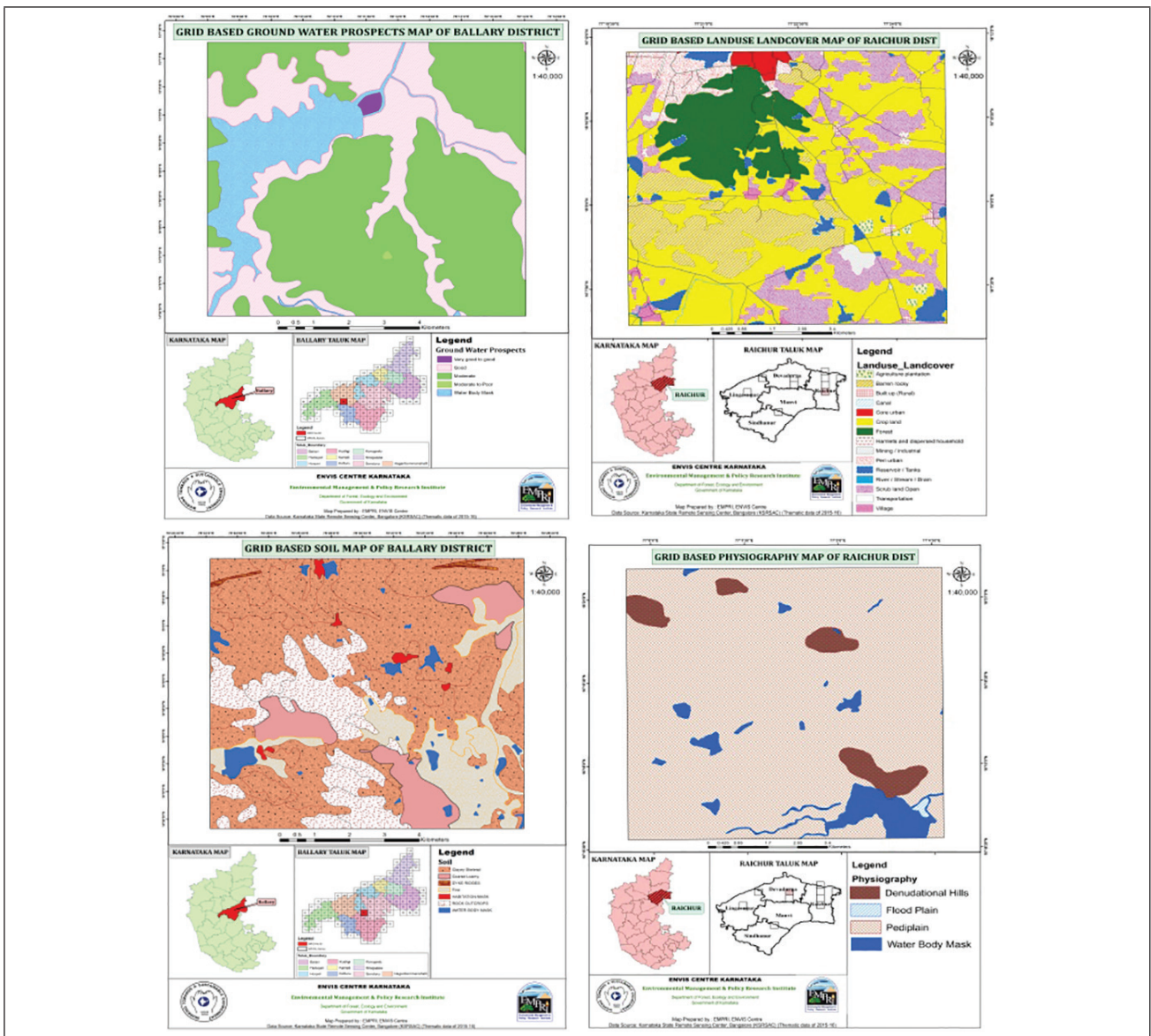
d) National Environment Survey (NES) - Grid Based Resource Information Decision Support System (GRIDSS)

EMPRI-ENVIS was entrusted to carry out National Environment Survey (NES) - a Grid based Resource Information and Decision Support System (GRIDSS) program for 14 districts of Karnataka viz., Ramnagar, Bengaluru rural, Bengaluru urban, Bidar, Chitadurga, Davangere, Tumkur, Chikkaballapura, Kolar, Raichur, Ballari, Kalaburagi, Koppal and Yadgir. The study was performed through different parameters such as water, soil, forest & wildlife, flora & fauna, wetlands, lakes, rivers, LU/LC, Mining &

water bodies etc. and mapped into 9 X 9km grids. Mapping of 14 districts of Karnataka were completed in the given stipulated time.

The centre has generated a total of 180 maps during 2021-22 and the details of the same are below:

- Koppal - 90 maps prepared for 10 selected grids under 9 themes
- Bellary- 90 maps prepared for 10 selected grids under 9 themes



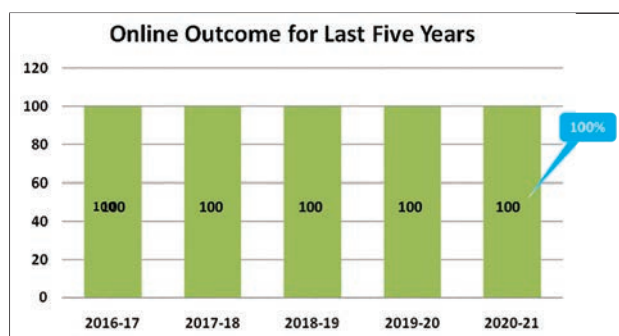
e) EMPRI Library

EMPRI library is a repository of information and has a collection of over 4000 books. It receives more than 27 state/national journals and newsletters covering diverse areas of environment.

Library resources

- There are more than 4000 books including text books, Reports, Success stories, Journals and project reports
- EMPRI Library has more than **170** CD-ROM
- Databases; 04 Newspapers (1 Kannada, 3 English) subscriptions and Toposheets maps- **650**.
- More than 60 Newsletters and published books (Empri and other concerned organisations)
- Subscription to the “The Indian Forester” Journal (TIFJ) and archival CD-ROM database (from **1875**)
- EMPRI library has been using the **KOHA** open source software (OSS) for Library automation. The Library has automated **4000** books which includes reference books, text books, reports etc.,

Karnataka State ENVIS Online Performance Report



Online Evaluation Outcomes for Last Five Years

f) Green Skill Development Programme (GSDP) Courses

- GSDP certificate course on ETP/STP/CETP Operation and Maintenance was organised by EMPRI for the science graduates during

16th December 2021 to 9th February 2022. The duration of this course was 300hrs and 17 graduates were trained during this programme.

- **Outcome:** GSDP trainees who participated in this programme are well versed with the knowledge gained during the course and three candidates got placements in various Research Institutions, NGO’s and Private Organizations, one student got into higher studies and the rest when contacted informed that they are preparing for competitive exams and also searching jobs.

g) Other Activities conducted by ENVIS Centre along with Host Institution EMPRI

1. **GIS Workshop:** EMPRI ENVIS organized a GIS workshop for EMPRI staff to enhance the GIS skills of the EMPRI staff. Theory and practical sessions were conducted. Theory included topics like Fundamentals of GIS, Spatial & Non spatial data, Spatial data modelling – Vector & Raster Models, Topologies, Integration of remote sensing and GIS. Practical sessions included topics like geo-referencing, digitization (point, line and polygon), buffering and preparation of layouts.
2. **World Environment Day:** EMPRI ENVIS celebrated Environment day on theme “Ecosystem Restoration”. During this day EMPRI ENVIS conducted a Quiz competition on Environment day through virtual mode. Around 1300+ participants participated in the competition. Participation certificates were given to all participants.
3. **World Ozone Day:** World Ozone Day 2021 with the theme Montreal Protocol - Keeping us, our Food and Vaccines Cool was celebrated on 16th September 2021. On this occasion, EMPRI ENVIS organized the Interschool Competitions namely Quiz Competition, Drawing Competition and Pick & Speak

Competition for school students. The function commenced with the inaugural session chaired by Shri. Santosh Sutar, Dr Hema N, Scientist and Dr. A K Chakravarthi, Scientist. The ozone day celebration also included the key note speech on “Importance of Ozone Day”. The celebration concluded with distribution of prizes to the winners of the competition. **Book Release:** ENVIS Released Environment related book on “Manual of Urban Tree Protection and Conservation to Beautify Indian Cities” on July 20, 2021.

4. **Pick and Speak Competition:** On behalf of Republic day, pick and speak competition was conducted for school students. The speeches of the students were very informative and the students were very confident. Winners were awarded and certificates were distributed to all participants.
5. **Wetlands Day:** EMPRI ENVIS celebrated wetlands day on 2nd February 2022. On this occasion Infographic poster competition was conducted. We received wide responses and best five posters were awarded. Certificates were distributed to all the participants.
6. **International Forest Day:** EMPRI ENVIS celebrated International Forest Day on March 21, 2022. On this occasion, two Range Forest Officers (RFO) Mr. Gururaj Sankeshwar, Bannerghatta RFO and Ms. Ranjitha, Anekal RFO was invited for sharing the experience inside the forest. On this occasion they were interviewed and video was released on EMPRI and ENVIS websites.
7. **World Water Day:** On March 22, 2022 EMPRI ENVIS celebrated world water day. To enhance creativity, imagination and to create awareness on water virtual fancy dress competition was conducted for kids between (2-10 years). The kids showcased

their versatility with the help of the character chosen and gave the message to save water. Winners were awarded and certificates were distributed to all participants.

h) **Creation of knowledge products and the database**

➤ **Database updated on Karenvis Website**

1. Agriculture Biodiversity of Karnataka
2. State-wise number of villages electrified
3. Source wise and State wise estimated Potential of Renewable Power in India
4. Region wise and state-wise Installed generating capacity of electricity
5. State-wise cumulative installed capacity of grid interactive renewable power
6. State-wise installation of Off-grid / Decentralised Renewable Energy Systems / Devices

➤ **Posters / leaflets prepared**

- World Wetland Day
- National Science Day
- International Day Of Action For Rivers
- World Sparrow Day
- World Heritage Day
- COVID-19 Awareness Poster
- COVID-19 - Coronavirus Symptoms Poster
- International Day for Biological Diversity
- World Environment Day
- Van Mahostava July 01 to July 07, 2021
- International Day for the Conservation of the Mangrove Ecosystem
- International Tiger Day
- World Nature Conservation Day
- World Lion Day
- World Elephant Day
- International day of Clean Air for Blue Skies

- World Ozone Day
- World Bamboo Day
- World Rhino Day
- World Rivers Day
- World Animal Day
- World Wildlife Week
- World GIS Day
- National Pollution Control Day
- World Soil Day
- National Farmer's Day
- World Wildlife Day
- International Day of Forests
- World Water Day

2.4.2. National Green Corps (NGC)

National Green Corps (NGC) is a National School Programme launched in 2001 by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India (GoI). The main objective of the scheme is to establish a "National Green Army" by creating Eco-clubs in schools all over the state to spread awareness of the environment and carry out action based programmes for protection and improvement of the environment. Environmental Management and Policy Research Institute (EMPRI) is serving as a Nodal Agency for NGC in Karnataka to implement the programme since January 2009. As per the guidelines of MoEF&CC, 10,200 eco-clubs have been established in 34 educational districts of Karnataka State for the financial year 2021-22. The details of eco-clubs are as follows:-

Number of Eco-Club Schools in Karnataka State under NGC Programme

SL No	Category of Schools	No. of Eco-club schools
1	Government Schools	8666
2	Government Aided Schools	1503
3	Private (Unaided) Schools	31
Total		10200

A. NGC Programme during 2021-22

The Government of India, MoEF&CC (EE-Division) have sanctioned Grants-in-Aid of Rs. 6,51,70,506/- (Rupees six crore fifty-one lakh seventy thousand five hundred and six only) and released Grants-in-Aid of Rs. 5,99,85,506 (Rupees Five crore ninety-nine lakh eighty-five thousand five hundred and six only) to EMPRI under Environment Education Awareness and Training (EEAT) Scheme for supporting the activities of NGC Programme in the State of Karnataka for the year 2021-22 vide order No.3-1/2020-EE dated 20th July 2021 & 26th July 2021 respectively.

Released Grants-in-Aid of Rs. 5,99,85,506/- included Rs. 2,04,00,000/- financial assistance @ Rs. 5,000/- per Eco-club to 4080 Eco-Clubs in 34 districts to be supported under General budget head and Rs. 3,06,00,000/- financial assistance @ Rs. 5,000/- per Eco-club to 6120 Eco-Clubs belonging to SC category in 34 districts to be supported under SC budget head maintaining 300 Eco-clubs per district in total. Total financial assistance of Rs. 5,10,00,000/- (Five crore and ten lakhs only) was released to 10,200 Eco clubs in 34 districts.

Released Grants-in-Aid also included financial assistance of Rs. 8,50,000/- (Rupees eight lakh fifty thousand only) for strengthening the implementation and monitoring at the district level in 34 districts @ Rs. 25,000/-per district and reimbursement of Rs. 81,35,506/- (Eighty-one lakh thirty-five thousand five hundred and six only) administrative charges (10% Administrative charges of the total releases to Eco-clubs and district level monitoring) incurred during the financial year 2020-21. Sanctioned Administrative charge for FY 2021-22 was Rs.51,85,000/- and actual administrative expenses incurred will be reimbursed by MoEF&CC in the FY 2022-23.

B. The breakup of Sanctioned & Released Grants-in-Aid for FY 2021-22

SI No	Particular	Sanction Amount (Rs.)	Release Amount (Rs.)
a	Financial assistance @ Rs. 5,000/-per Eco-club to 4080 Eco clubs in 34 districts with the ceiling of 300 Eco-clubs per district	2,04,00,000/-	2,04,00,000/-
b	Financial assistance @ Rs. 5,000/-per Eco-club to 6120 Eco-clubs belonging to SC category in 34 districts with the ceiling of 300 Eco-clubs per district	3,06,00,000/-	3,06,00,000/-
c	Financial assistance for strengthening the implementation and monitoring at district level in 34 districts @ Rs. 25,000/- per district	8,50,000/-	8,50,000/-
d	Administrative charges for FY 2021-22: (10% Administrative charges of the total releases to Eco-clubs and district level monitoring (a+b+c)	51,85,000/-	
e	Reimbursement of administrative charges incurred during FY 2020-21	81,35,506/-	81,35,506/-
Total Grants-in-Aid		6,51,70,506/-	5,99,85,506/-

C. Fund transferred details of Eco-Clubs and Samagra Shikshana, Karnataka (SSK) of 34 educational districts

EMPRI had transferred Rs. 2,04,00,000/- financial assistance @ Rs. 5,000/- per Eco-club to 4080 Eco-Clubs belonging to the General category and Rs. 3,06,00,000/- financial assistance @ Rs. 5,000/- per Eco-club to 6120 Eco-Clubs belonging to SC category in 34 districts maintaining 300 Eco-

clubs per district in total. Total financial assistance of Rs. 5,10,00,000/- was transferred to 10,200 Eco clubs. EMPRI had also transferred financial assistance of Rs. 8,25,000/- to 33 educational districts (Except Bellary district as district had not submitted UC of 2020-21) @ Rs. 25,000/- per district for strengthening the implementation and monitoring at district level.

D. Activities /Programmes under National Green Corps for the year 2021-22

Sl. No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
1	World Earth day, 2021	22-04-2021	Online (Bangalore North, Bangalore South Bangalore Rural & Ramanagara district)	Eco-club in charge teachers & Students	365	Resource person, Mrs. Nalini Shekar, Social activist and Co-founder of "Hasiru Dala", A non-profit organization, Bangalore delivered a lecture on Solid Waste Management & on waste pickers. Resource person, Mr. Vasuki Iyengar, Soil & Health solutions, Bangalore delivered a lecture on wet waste & dry waste management & composting.
2	World Environment Day Celebration-2021	05-06-2021	Online	EMPRI Staff & Public	100+	A Webinar on "Importance of World Environment day" was organized. The following resource personnel spoke in the event. <ul style="list-style-type: none"> • Keynote address by Shri Ajay Mishra IFS, PCCF(wildlife)Retd. • "Significance of Ecosystems" by Dr. K.H Vinaya Kumar IFS Director (Research) (In charge) EMPRI. • "Importance of World Environment day" by Shri Mahesh T, Technical Director EMPRI. • "Ecosystem Restoration" by Dr. M K Ramesh, Prof. NLSIU.
3	Ek Bharat Shreshth Bharat programme	06-07-2021	Online	Nodal officers, Eco- club in charge teachers and Students of Karnataka & Uttarakhand	450	A Webinar on "Rare biodiversity elements and Heritage sites of Karnataka and Uttarakhand" was organized with the paired state, Uttarakhand. Dr. A K Chakravarthy, Research Scientist, EMPRI & Mr. D P Purohit, State Coordinator, Samagra Shikshana, Uttarakhand explained rare biodiversity elements of respective state.
4	Bannerghatta Biological Park information on NGC website	August 2021 to till date	Online	Eco-club in charge teachers, students & Public	-	Display of information of Butterfly park of Bannerghatta Biological Park on NGC website to disseminate information to the public.
5	Training on "Conservation Education"	03-08-2021 to 04-08-2021	Online	Eco-club in charge teachers	100+	Methods of conservation of environment in schools discussed in the training organized by Central Academy for State Forest Service, Dehradun

Sl. No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
6	Launch of One Earth One home Programme by WWF India	09-08-2021	Online	Nodal Officer, Eco-club in charge teachers & Students	450+	WWF India's "One Earth One home Programme" was implemented in selected Eco club schools. The programme was focused on the importance of instilling a pro-environment attitude and behaviour in students.
7	Turmeric Ganesha Campaign	30-08-2021	Online /NGC website & Eco club schools	Eco-club in charge teachers, Students & Public	-	Turmeric Ganesha Campaign by Karnataka State Pollution Control Board (KSPCB) was publicized through NGC website. Many Eco-club schools celebrated eco-friendly Ganesha festival and promoted turmeric Ganesha Campaign.
8	International Day of Clean Air for Blue Skies	07-09-2021	Online	Eco-Club in charge teachers, Government Officers & Public	100+	Importance of clean air and efforts to improve air quality discussed in the webinar organized by Karnataka State Pollution Control Board (KSPCB).
9	World Ozone Day Celebration, 2021	16-09-2021	EMPRI, J P Nagar	Eco-Club students, Teachers & EMPRI staff	250+	<ul style="list-style-type: none"> Ozone day was celebrated in association with ENVIS section by organizing interschool Competitions Namely Quiz Competition, Drawing Competition and Pick & Speak Competition. 1. Government High School, Sarakki, Bangalore, 2. Government High School, Puttenahalli, Bangalore and 3. Indira Priyadarshini High School, J P Nagar, Bangalore participated in the event. Dr. K.H Vinaya Kumar, IFS (Retd.), Director Research, Shri. T. Balachandra, IFS (Retd.), JSW project coordinator, Shri. Santosh Sutar, Media Adviser KSPCB, and Dr. A K Chakravathi, Scientist, Centre for Lake, EMPRI participated in the event and briefed about the importance of ozone layer. Saniabanu kivudammanavara, Government Urdu High School, Kanavalli, Haveri district won third prize in National Level poster making competition organized by MoEF&CC, National Museum of Natural History in collaboration with Ozone cell to commemorate ozone day

Sl. No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
10	Training of Eco club teachers of Ramanagar district	25-11-2021	Online	Eco-club in charge teachers	100+	Mr. Harish, Program Associate, NGC participated in the training as a resource person and explained NGC activities to be carried out in schools.
11	National Girl Child day	24-01-2022	Online	Public	300+	"Selfie with daughter" online campaign was organized. Selected selfies were posted in NGC Social media accounts.
12	World Wet Land Day Celebration 2022	02-02-2022	Online	Public & Eco-club in charge teachers	500+	A webinar was organized in association with WWF India and Karnataka State Pollution Control Board (KSPCB) on the topic "River wetland connectivity for restoration of wetlands".
13	General awareness course on Conservation of Forests, Wildlife and Environment	07-02-2022 to 08-02-2022	Online	Eco-club in charge teachers	492	World of wild flora & Fauna, Birds Biodiversity, planting trees & other related topics discussed in the training organized by Central Academy for State Forest Service, Coimbatore
14	Operationalization of NGC Web Application in Schools and districts	From FY 2021- 22	Online	Eco-club in charge teachers & district nodal officers	All Eco-clubs & District nodal officers	NGC Web Application has been operationalized in Eco-club schools and districts for uploading Reports, Utilization certificates and all other information related to NGC programme.
15	Printing of NGC Handbooks & Makkala Chandada parisara books	February 2022	-	Eco-club in charge teachers & district nodal officers	All Eco-clubs & District nodal officers	NGC handbook is a concise manual/reference book providing useful information about NGC Programme. Makkala Chandada Parisara book is a book for children on environment written by Sri Nagesh Hegde. 17,000 copies of each of the books were printed and will be sent to all the Eco-club schools of Karnataka State.

E. Azadi ka amrut mahotsav activities

S.I No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
1	Bharat ka amrut mahotsav-75 Green good deed activities	01-04-2021 to 31-03-2022	Eco-club schools and online programmes	School students, Eco-club in charge teachers and public	All Eco-club schools	India will be celebrating the 75 th year of Independence on 15 th August 2022 and the Government of India is planning to commemorate the occasion by organizing a 75-week-long Bharat ka Amrut Mahotsav. In this context, the Eco-clubs had been assigned to carry out a 75-week-long outreach programme starting from the first week of March 2021. A Green Good Deed to be taken up as the "Green good deed of the week". A list of 75 Green good deeds sent by MoEF&CC was translated to Kannada language and circulated among the districts and Eco-club schools. Eco-clubs carried out several green good deed activities.
2	Webinar on Solid waste Management rules	09-04-2021	Online	Eco-club teachers & Students	140	Resource person, Sri Kumara Swamy, Former member secretary KSPCB, delivered a lecture on Solid waste management rules and Environmental benefits of waste management.
3	Webinar on Rainwater harvesting	15-04-2021	Online	Eco-club teachers & Students	300	Resource person Sri Shivakumar, Scientist, Karnataka State Council for Science & Technology explained rainwater harvesting methods, its advantages & mobile application to learn rain water harvesting methods.
4	Webinar on Ecosystem Restoration	11-06-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	149	Resource person Sri D.R. Kumaraswamy, CEO (Retd.), KSPCB explained different ways of ecosystem restoration.
5	Webinar on Conserve what our children deserves through sustainable development	15-06-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public.	114	Resource person Dr. M Lokeshwari, Associate professor and NSS officer, RV College of Engineering, Bengaluru talked about the importance of sustainable development & conservation of environment.

S.I No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
6	Webinar on Renewable and non-renewable energy sources and environmental management	17-06-2021	Online	Officers and Staff of various departments, Corporates, NGOs, educational institutes and public	73	Resource person Sri Ramesh Kumar B.N, Chief Environmental Officer(Retd.), KSPCB and Chairman, Prakruthi Institute of Environmental Studies discussed the importance of renewable and non-renewable energy sources to protect our environment.
7	Webinar on Mangroves to save Earth	18-06-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	30	Resource person V.N. Nayak, Professor of Marine Biology (Retd.) explained about the mangroves and their importance in the coastal ecosystem.
8	Webinar on Mental Health during Covid-19 Pandemic	19-06-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public.	58	Resource person Dr. Raveesh. B.N, Professor & Head Dept. of Psychiatry, Mysore Medical College talked about Mental Health during Covid-19 Pandemic situation.
9	Webinar on Indian Constitution and Environmental Protection	24-06-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public.	18	Resource person Dr. M.K. Ramesh, Professor NLSIU, spoke about Indian Constitution, Environmental Protection and duty of every citizen of India to protect and improve the natural environment.
10	Webinar on Noise and its effects on Animals and how it is measured	25-06-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	15	Resource person Radheshyam Balaji, Addl. Director (Retd.), CPCB, talked about noise pollution and its effects on animals.
11	Webinar on Legal Empowerment of Environmentally Benign Traditions	26-06-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public.	28	Resource person Dr. M.K. Ramesh, Professor NLSIU, briefed about Legal Empowerment of Environmentally Benign Traditions.
12	Webinar on Global commons and Local Actions	28-06-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public.	248	Resource person Prof. Nagesh Hegde, Renowned Environmentalist and visiting Professor at Indian Institute of Journalism and New Media (IJJNM), Bengaluru explained Global commons and regulations to control its uses.

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
13	Webinar on Environmental Compensation – Tool for Pollution Control	29-06-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public.	428	Resource person Dr. D. R. Ravi, SEO, KSPCB, Bengaluru presented a presentation on Environmental Compensation for the protection of the environment.
14	Webinar on Rural Sanitation	01-07-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public.	48	Resource person Sri D.R. Kumaraswamy, CEO(Retd), KSPCB briefed about Rural Sanitation and its importance in protecting human health and the environment.
15	Webinar on Stress and Resilience during Pandemic	03-07-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public.	18	Resource person Dr. Shivananda Manohar briefed about Stress resilience during coronavirus Pandemic.
16	Webinar on Destruction of Biodiversity and its impact on Ecosystem	05-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	31	Resource person Sri D.R. Kumaraswamy, CEO(Retd.), KSPCB explained how biodiversity loss disrupts the functioning of ecosystems.
17	Webinar on Coastal & Marine Bio-diversity	06-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	255	Resource person V.N. Nayak, Professor of Marine Biology (Retd) briefed about the importance of Coastal & Marine Bio-diversity.
18	Webinar on Hazardous Waste Management – Rules and Regulations	09-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public.	31	Resource person Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru briefed about the Rules and Regulations of Hazardous Waste Management and its impact on human health and the environment.
19	Webinar on Science of Climate Change- Adaptation and Mitigation	12-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	90	Resource person Dr.Indu K. Murthy Principal Research Scientist, CSTEP briefed about Adaptation and Mitigation options to address climate change.

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
20	Webinar on Covid-19 Waste Management	13-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	22	Resource person Radheshyam Balaji, Addl. Director (Retd.), CPCB briefed about Covid-19 Waste Management as per the CPCB guidelines.
21	Webinar on Disaster & Management Strategies	14-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and public.	43	Resource person V.N. Nayak, Professor of Marine Biology (Retd.) briefed about Disaster & effective Management Strategies.
22	Webinar on Nexus between Climate Change, Public Health & Covid-19: An Inconvenient Truth	15-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	39	Resource person Prof Krishna Raj, ISEC briefed about the relationship between Climate Change, Public Health & Covid-19 pandemic.
23	Webinar on Western Ghats – Today & Tomorrow	16-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	27	Resource person Prof. Nagesh Hegde, Renowned Environmentalist and Visiting Professor at IJNM (Indian Institute of Journalism and New Media), Bengaluru briefed about the importance of Western ghats and threats to its ecosystem.
24	Webinar on Our role in creating a Cleaner, Greener and Kinder Earth	22-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public.	27	Resource person Mrs. Deepambika T J, Go-green Enthusiast & Educator, Singapore explained Our role in creating a Cleaner, Greener and Kinder Earth.
25	Webinar on Role of industries in sustainable development	23-07-2021	Online	Officers and Staff of various departments, Corporates, NGO's, educational institutes and public	87	Resource person Prof. Nagesh Hegde, Renowned Environmentalist and visiting Professor at IJNM (Indian Institute of Journalism and New Media), Bengaluru briefed about Role of industries in sustainable development & protecting environment
26	Webinar on Solid Waste Management in Covid times and afterwards	26-07-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public	41	Resource person Radheshyam Balaji, Addl Director (Retd.), CPCB, Bengaluru briefed about Solid waste Management in Covid times and afterwards

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
27	Webinar On 75 Green Good Deeds	28-07-2021	Online	Eco-club in charge teachers	300+	NGC staff explained the "Green Good Deeds" activities to be carried out at school level.
28	Webinar on Pandemic Prevention: Simple steps	29-07-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public.	15	Resource person Dr S Pruthvish, Public Health Expert, President, Society for Community Health Action and Research (SOCHARA), Bengaluru briefed about the steps to prevent pandemic situation.
29	Webinar on E-Waste-Responsibilities of different stakeholders to reduce the adverse impact	30-07-2021	Online	Officers and staff of various departments, Corporates, NGO's, educational institutes and public	124	Resource person Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru briefed about E-Waste – Responsibilities of different stakeholders to reduce the adverse impact.
30	Webinar on Global Warming impact on World Environment	31-07-2021	Online	Officers and staff of various departments, Corporates, NGO's, Educational institutes and public.	97	Resource person Mr. D.R. Kumaraswamy, CEO(Retd.), KSPCB, Bengaluru briefed about Global Warming impact on World Environment.
31	Green good deed of the week campaign.	05-11-2021 to 11-11-2021	Field Visit	Eco club school visit of Ramanagara, Mandya, Mysore & Chamarajanagara districts	21 Eco-club schools	During Green good deed of the week campaign, 21 Eco-club schools were visited by Mr. Mallesh, Programme Associate NGC. Schools organized drawing, quiz and other activities related to green good deeds.
32	Nature walk-Rivers of India celebration	21-12-2021	Doresanipalya Forest, JP Nagara	Eco-club students	60+	A "Nature walk" was organized at Doresanipalya Reserve forest, Bangalore. Students from Karnataka Public School (KPS), Agara Bangalore participated. Shri Balasubramanya Sharma, Research Associate and Botany specialist and Shri Chathurved Shet, Research Associate and specialist in butterflies and spiders were the resource persons for the program. Students were shown and briefed regarding identification and features of the different species of plants, trees, butterflies, spiders, birds and other insects of the Doresanipalya Reserve Forest. A speech competition was also organized for the students on the topic "Rivers of India". Apart from that, a book on "Moths and Spiders of Bangalore" were distributed to the students by Mrs. Ritu Kakkar, IFS, PCCF, Director General (in charge), EMPRI and Dr. Vinay Kumar, IFS (Retd), Director Research EMPRI.

F. Bharat ka amrut mahotsav activities (Wetland Division-MoEF&CC)

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
1	Webinar on "water body Restoration"	14-06-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	46	Dr. Shobha Anand Reddy, Independent Environment Consultant, presented a presentation on restoration of water bodies.
2	Webinar - "Don't make water sick"	16-06-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	83	D. R. Kumaraswamy, CEO(Retd.), Karnataka State Pollution Control Board, presented a presentation on water pollution & importance of Water bodies.
3	Webinar - Wetlands Importance and Conservation	30-06-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	131	Dr. Shobha Anand Reddy, Independent Environment Consultant, explained the importance and Conservation of water bodies.
4	Competitions for School Students	01-08-2021 to 31-08-2021	online	Ecoclub School students	196	Slogan & Drawing Competitions for School Children on the theme "wetland conservation" conducted.
5	Webinars on wetland conservation	19-08-2021 to 23-08-2021	Online	Eco-club in charge teachers, education department officials of Davanagere, Chikkodi & Sirsi Eco-club in charge teachers, education department officials of Kodagu, Uttara Kannada & Chikkaballapura	210 95	In association with WWF India Ltd, webinars were organized. Resource persons Shashikala Iyer and Lohit Y. T, WWF-India conducted webinars on the following topics. <ul style="list-style-type: none"> Water Footprint (Individual & community/school level) assessment and reduction Conserving urban wetlands. Case study of wetland rejuvenation with multi-stakeholder participation

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
6	Webinars on wetland health assessment	25-08-2021 26-08-2021	Online	Eco-club in charge teachers, education department officials of Mandya, Kalburagi & Madhugiri Eco-club in charge teachers, education department officials of Chikamagalur, Haveri & Shimoga	435 430	Resource persons Shashikala Iyer and Lohit Y. T, WWF-India conducted webinars on the following topics. <ul style="list-style-type: none"> • Wetland Health assessment-process. • Bird watching & bird identification. • Role of wetland mitras for wetland conservation.

G. Azadi Ka Amrut Mahotsav- Celebration of Iconic week-from 4th to 10th October 2021

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
1	Webinar on "Awareness about Plastic usage"	04-10-2021	Online	Eco-club in charge teachers	75+	Mr. Vijayakumar, President, Karnataka State Polymers Association, Karnataka briefed about the plastic usage and curbing the single use plastic.
2	Webinar on lake/wetland/ water conservation.	05-10-2021	Online	Eco-club in charge teachers	200+	Mr. Lohit, Asst. Manager, WWF. India explained about wetland & water conservation
3	Webinar on Greenhouse gas & Climate change	07-10-2021	Online	Eco-club in charge teachers	30+	Mr. Mahesh Kashyap, Independent Consultant, explained about climate change and impact of Greenhouse gases.
4	Webinar on Wildlife conservation	08-10-2021	Online	Eco-club in charge teachers	615+	Mr. Balachandra T, IFS, (Retd.), Coordinator, JSW Project, EMPRI explained about Wildlife conservation & various efforts of Indian Government for wildlife conservation.
5	Webinar on Forest Conservation/Afforestation	09-10-2021	Online	Eco-club in charge teachers	125+	Dr. K. H Vinay Kumar, IFS (Retd) & Director (Research), delivered a talk on conservation of forests & importance of afforestation.
6	Poster making competitions	02-10-2021 to 08-10-2021 (Wild life week)	Online	Eco-club students	249	Poster making competitions on the theme "wildlife conservation" were conducted.

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
7	Craft competitions	04-10-2021 to 08-10-2021	Online	Eco-club students	160	Craft competitions on the theme "Reuse of plastic" conducted
8	Slogan writing competitions	04-10-2021 to 08-10-2021	Online	Eco-club students	159	Slogan writing competitions on the theme "Afforestation" were conducted.
9	Distribution of cotton bags & Eco-friendly dust bins to Eco-club schools	04-10-2021 to 08-10-2021	Eco club schools	Eco-club school visit of Bangalore north dist.	6 eco club schools	NGC staff visited Eco club schools and distributed cotton bags & Eco-friendly dust bins to create awareness on curbing the single use plastic.

H. Education programmes by Petroleum Conservation Research Association (PCRA)

S.L No.	Name of Campaign /Program	Dates of the campaign	Location	Target group	No of Participants	Summary
1	Energy conservation & Environment protection education programme	01-04-2021 to 31-03-2022	Eco-club schools	Eco-club Students	135 Eco club schools	12 Education programmes are conducted annually in each of the schools through a designated nodal school teacher. EMPRI is serving as a State nodal agency from 2021-22 to implement and monitor the programme in the State. Schools organize programmes by forming "Energy Conservation Club".
2	Training on PCRA Programme	08-07-2021	Online	Eco-club in charge teachers	200	PCRA & NGC team jointly conducted online training to nodal school teachers. Guidelines of the programmes were discussed. Content, videos, Literature on energy conservation were shared with the teachers.

I. Activities /Programmes under Swachhhta Action Plan for the year 2021-22

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary	
Theme 1. Awareness on curbing the single use plastics						
1	01-08-2021 to 31-03-2022	Idya and Bengre beaches in Dakshina Kannada district	Public	10,000+	Cleaning & awareness activities at beaches conducted daily by the cleaning staff. Collected waste materials including plastic waste were handed over to the concerned authority for proper disposal.	
		Hanagerekatte village	Public	500+	In association with Karnataka Forest Department, Deputy Conservator of Forests, Wildlife Division, Shimoga district, cleanliness drives and awareness activities on curbing the single use plastics conducted. Staff of Forest Department, Gram panchayat, Non-government organizations, local traders and villagers participated in the activities and created awareness among the public.	
		Moogudthi Village				
		Shimoga urban				
		Sakrebailu village				
2	20-07-2021	Online	Officers and Staff of various departments, Corporates, NGOs, educational institutes and public	108	Resource person Dr. M Lokeshwari, Associate professor and National Service Scheme Officer, RV College of Engineering, Bengaluru briefed about the impacts of Plastic & Re-engineering on sustainable infrastructure	
		Srinivasa Sagara.	Public	500+	Cleanliness drive was conducted in association with Hasiru Sene (NGO), local authorities and public. Plastic waste and other waste materials were collected, segregated and disposed with concerned authorities. Created awareness to street vendors regarding alternatives to plastic products.	

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
	11-03-2022	BRT Tiger Reserve, Yaladur wild life division	Public & School children	100+	In association with Karnataka Forest Department, BRT Tiger Reserve, Yaladur wild life division, cleaning and awareness activities on plastic pollution was conducted. Staff of Forest Department, KSRTC employees, members of Grama panchayat and public participated. Biligiri Ranganatha temple and Biligiri rangana hill had been declared as a plastic free zone by DC, Chamarajanagara. Temple authority and Gram Panchayat have banned use of plastic bags in and around temple, in shops and by street vendors
	14-03-2022 to 18-03-2022	Mahadevapura, Chinayakana halli, Arakere, Chananakere, Aalagoodu, Hunjanakere villages of Srirangapatna taluk & Thippur, Chandahalli, Bhimanakere villages of Maddur taluk	Public	300+	In association with Karnataka Forest Department, Deputy Conservator of Forest, Mandya district, Street plays were conducted in 9 villages on the theme "Plastic free, pollution free & fire free forest and save wildlife" by Arunodaya Kala tанда, Srirangapatna and created awareness among public.
3	01-03-2022 06-03-2022 16-03-2022	Devarayanadurga reserve forest, Namadachilume area, Durgadahalli cross Forest area of 5 th mile	Public & NGOs.	100+	In association with Karnataka Forest Department, Deputy Conservator of Forest, Tumkur district, Cleanliness drives and awareness activities were conducted at the road sides of Devarayanadurga reserve forest areas. Plastic and other waste were collected, segregated and disposed with concerned authorities

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
	12-03-2022	Bapuji high school, Baramasagara, Chitradurga district	Public & School Students	500+	In association with Forest Department, Deputy Conservator of Forest, Chitradurga district, awareness activities were conducted on curbing the single use plastic in 5 locations and created awareness among public and students on banned plastic items in Karnataka and alternate to plastic
	14-03-2022	Farmers training centre, Chikkajajur, Holalkere taluk			
	15-03-2022	M.V.R Government High school, M G Dibba, Hosadurga taluk			
	15-03-2022	Government High school, Kanguvalli, Hosadurga taluk			
	16-03-2022	Sri Manjunatha Swamy high School, Holalkere taluk			
4	Swachta Pakwada Program				
	a) Awareness campaign on 01-12-2021 to 15-12-2021				
i)	Awareness activities in Eco-club schools	Malleshwaram, Bangalore	Eco-club schools & students	100+	Awareness programme conducted at Government Boy's high school, Malleshwaram. Distributed eco-friendly dust bins, cotton bags and awareness handouts on "Banned plastic items of Karnataka" and "Solid waste management rules". Drawing, slogan writing & essay writing competitions were conducted for the students on different environment themes.
ii)	Awareness campaign at public place	Flower market, Bus stand, Market, Railway station, Malleshwaram & Yashwanthpura Bangalore	Public	1000+	Sensitization to issues of environment created for public. Along with NGC team, BECOM (Bangalore Electricity Supply Company Limited), Bruhat Bengaluru Mahanagara Palike (BBMP) officials joined the campaign. Distributed handouts on "Banned plastic items of Karnataka" and "Solid waste management rules".

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
iii)	03-12-2021	Project Office of EMPRI & BWSSB office campus, Malleshwaram	Staff of EMPRI	50+	Conducted cleaning and awareness activities at Project office EMPRI & BWSSB campus.
iv)	04-12-2021	Eco club schools of Davanagere, Dakshina Kannada, Sirsi, Madhugiri, Bangalore and Udupi districts	Eco-club school students	200+	Eco-club schools conducted drawing, quiz, poster making and craft making competitions for the students on different themes of environment.
v)	06-12-2021	Eco club schools of Belgaum, Chikkodi and Gadag	Eco-club school students	200+	Eco-club schools conducted drawing, essay and skit competitions to the students on different environment themes.
vi)	07-12-2021	Chikkaballapura district	Public & Eco-club schools	1000+	Awareness campaign organized on curbing the single use plastic and solid waste management. Municipal staff of Chikkaballapura, staff of Karnataka State Road Transport Corporation, Public in bus stand, Street hotels, shops and other local areas were sensitized towards issues of environment.
vii)	08-12-2021	Bangalore city	Public & Eco-club school	1000+	Awareness campaigns were organized in public places on curbing the single use of plastic, focusing on banned single use plastic items by Government of Karnataka. Visited public places namely auto stands, hotels, bus stands, bookshops, public offices like "Bangalore One Office", BWSSB office and other public offices and sensitized theme about issues of environment. Created awareness among construction workers, police personnel, drivers, conductors, students and public. Distributed awareness handouts, cotton bags during the campaign. sanitizers and masks were distributed to underprivileged.

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
viii)	09-12-2021	Bangalore city	Public	200+	Clean-up and sensitization drive was conducted at BWSSB campus by mobilizing local stakeholders to create awareness on curbing the single use plastic and waste management. BBMP and BWSSB collaborated with NGC team in clean up and awareness drive.
ix)	13-12-2021	Ramanagara and Mandya districts	Public and Eco-club schools	1000+	Awareness activities conducted at public places and Eco-club schools by distributing handouts related to banned single use plastic items in Karnataka and solid waste management. Competitions conducted for school children on different environment themes.
x)	14-12-2021	Tumkur district	Public and Eco club schools	500+	Awareness activities conducted at public places and Eco-club schools by distributing handouts related to banned single use plastic in Karnataka and solid waste management. Competitions conducted for children on different environment themes
b) Webinars 28-02-2022 to 25-03-2022					
i)	28-02-2022	34 Educational districts (Online)	Public	145	Ms. Pinky Chandran, Freelance Researcher of "Hasirudala" organization briefed about "Top plastic polluters of Karnataka" and created awareness on environment pollution.
ii)	03-03-2022	34 Educational districts (Online)	Public & Eco-club schools	120	Ms. Shruthi Krishnan, Secretary of "Fields of view" organization, explained the benefits of water conservation
iii)	05-03-2022	34 Educational districts (Online)	Eco-club school students	40	Organized "Read aloud session" for Eco-club students. Ms. Chaitra T S, Programme manager of "Hasirudala" organization, briefed about the 3 R's of waste management through stories.
iv)	11-03-2022	34 Educational districts (Online)	Eco-club school in charge teachers	70	Ms. G Pramila, Community facilitator of Hasirudala, described the importance of segregation of waste.

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
v)	Awareness on Reducing waste footprint	34 Educational districts (Online)	Public	180	Ms. Smita Kulkarni, founder of "Stonesoup" demonstrated the zero waste tips and alternatives to plastics.
	vi) Session on Trashonomics	34 Educational districts (Online)	Eco-club school students	200	Ms. G Pramila, Community facilitator of "Hasirudala" described the importance of segregation of waste.
	vii) Webinar ongoing green begins at home	34 Educational districts (Online)	Public	250	In association with "Solid Waste Management Round Table" and "Hasirudala" organization, created awareness on low waste living style.
	viii) Session on Climate adaption	34 Educational districts (Online)	Eco-club schools	200	Sri Akbar A, project manager and Sri Kiran A, coordinator of "Hasirudala" explained their first attempt to Climate adaptation, retrofitting of roofs at Jyothipura, Bangalore.
5	Awareness on Biomedical waste disposal	31 districts of Karnataka State (Online)	Medical staff	7452	<p>In association with Training Division EMPRI, District-wise online trainings conducted to create awareness among medical staff of health department of 31 districts of Karnataka State. Training conducted by the following resource personnel.</p> <ul style="list-style-type: none"> • Dr. S. Pruthvish, M.S Ramaiah Medical college, Bangalore, • Sri D R Kumaraswamy, Chief Environment Officer (Retd.), Karnataka State Pollution Control Board, Bangalore • Dr. Lalitha, K, M.S Ramaiah Medical college, Bangalore, • Dr. Suman, M.S Ramaiah Medical college, Bangalore, • Dr. B. Ramakrishna Goud, St. John's Medical College, Bangalore • Dr. Hemagiri, Government Medical College, Karwar • Dr. Narasimha, Kodagu Medical College, Madikeri • Dr. Manjunath Nekar, KIMS, Hubli • Dr. Shivraj Chikkamagaluru Medical College, Chikkamagaluru • Dr. Akshaya K M Yenepoya Medical College, Mangalore • Smt. Anjana Kumari, Scientist D, Central Pollution Control Board, Bangalore • Mr. Manoj Kumar, Technology Lead, Knowledge lens, Bangalore

Sl. No	Swachtha Hi Seva	Dates of the campaign	Location	Target group	No of Participants	Summary
6	Swachtha Hi Seva	March 2022	Radio Programs in All India Radio	Public	4 resource personnel	Organized Radio Programs on All India Radio on the theme "Swachta Hi Seva". The following Resource personnel delivered talks <ul style="list-style-type: none"> • Dr. K H Vinay Kumar, IFS (Retd), Director (Research), EMPRI • Sri D R Kumaraswamy, Chief Environment Officer(Retd.), Karnataka State Pollution Control Board, Bangalore • Sri Shivaprakash Adiga, Eco club in charge teacher, Government High School, Sooda, Karkala • Sri. T G. Prem Kumar, District Nodal Officer, NGC, Kodagu
Theme 2. Awareness on air and water pollution						
1	Awareness on air pollution					
	a) Webinar on ozone hole impact	21-06-2021	Online	Officers and Staff of various departments, Corporates, NGOs, educational institutes and public	25	Resource person Sri D.R. Kumaraswamy, CEO(Retd.), Karnataka State Pollution Control Board, briefed about the impacts of ozone hole on environment.
	b) Webinar on Air Pollution and Health	23-06-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	28	Resource person Shri. Radheshyam Balaji, Addl. Director (Retd.), Central Pollution Control Board (CPCB), explained about the adverse effects of Air pollution on health.
	c) Webinar on Air Act 1981 & its implementation by Pollution Control Board	08-07-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	325	Resource person Shri. D.R.Kumaraswamy, CEO(Retd.), Karnataka State Pollution Control Board briefed about Air Act, 1981 & its implementation by Karnataka State Pollution Control Board (KSBCB).

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
d)	17-07-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	91	Resource person Shri. D.R. Kumaraswamy, CEO(Retd.), Karnataka State Pollution Control Board briefed about the impact of Air Pollution on living organisms.
e)	24-07-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	27	Resource person Shri. D. R. Kumaraswamy, CEO (Retd.), Karnataka State Pollution Control Board (KSPCB)briefed about impacts of vehicular pollution in Bengaluru.
f)	21-12-2021 to 12-01-2022	34 Educational districts (online)	Eco-club teachers & public	3571	In association with Centre for Capacity Building conducted , district wise trainings conducted for Eco-club in charge teachers of 34 Educational districts. The following resource persons conducted trainings. <ul style="list-style-type: none"> Shri. Ramesh Kumar. B.N, Chief Environmental Officer (Retd.), KSPCB, Chairman, Prakruthi Institute of Environmental Studies. Shri.. D.R. Kumaraswamy, CEO(Retd.), KSPCB, Bengaluru Shri. Radheshyam Balaji, Addl. Director (Retd.), CPCB, Bengaluru. Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru. Shri.. Lakshmi Kanth, Environmental Officer, Karwar.

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
2	16-06-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	83	Resource person Shri. D. R. Kumaraswamy, CEO (Retd.), Karnataka State Pollution Control Board (KSPCB), explained the importance of drinking water.
	07-07-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	27	Resource person Dr. B. Nagappa, Former Sr. Scientific Officer, Karnataka State Pollution Control Board (KSPCB), Bengaluru briefed about the innovative ideas & hybrid technology for safe drinking water.
	19-07-2021	Online	Officers and staff of various departments, corporates, NGOs, educational institutes and public	43	Resource person Shri. Radheshyam Balaji, Addl. Director (Retd.), Central Pollution Control Board briefed about safety of drinking water and future water scenario
	12-01-2022 to 14-01-2022	Hassan, Mandya, Bangalore North & Bangalore South (Online)	Eco-club teachers & public	1097	In association with Centre for Capacity Building, district wise trainings conducted for Eco-club teachers & public of 4 districts. Following were the resource persons <ul style="list-style-type: none"> • Dr. Channakeshava. S, Associate Professor, Dept. Of Soil Science & Agricultural Chemistry, University of Agricultural Sciences (UAS), Bengaluru • Dr. B. Nagappa, former Senior Scientific Officer, KSPCB, Bengaluru

Sl. No	Awareness activities	Dates of the campaign	Location	Target group	No of Participants	Summary
	e) Awareness activities at Kodagu district	23-02-2022 24-02-2022 27-02-2022 28-02-2022	Maakutta Pushpagiri, Shrimangala & Talakaveri (Wildlife division of Madikeri district)	Public	2382	In association with Karnataka Forest Department, office of Deputy Conservator of Forest, Wildlife division, Kodagu district, organized street plays and created awareness on cleanliness and water pollution to the Public.
	f) Online competitions	15-01-2022 to 14-02-2022	All over Karnataka	Public	12	3 Online competitions were conducted through NGC social media sites to create awareness among public and winners were awarded with cash prizes.. 1) Eco-friendly New year's resolution on NGC Twitter 2) Sustainable Home décor on NGC Instagram 3) Eco-friendly Gardening competition on NGC Facebook
3	Awareness to prevent littering a) Awareness activities at Mala Mahadeswara hill, Chamarajanagar, district	13-03-2022	Mala Mahadeswara Wildlife Division, Kollegal	Public	350	Cleanliness drive and awareness activities were conducted at Male Mahadeswara hill in association with Deputy Conservator of Forest office, Forest Department, MaleMahadeswara Wildlife Division, grama panchayat, volunteers and public, Kollegal. 7 tons of plastic waste was collected and disposed with the concerned authority. Malai Mahadeswara temple and village were declared as plastic free zone by DC, Kollegal. Took action on spread awareness on prohibition of the use of single use plastic bags in and surrounding areas of temples and in shops.
	b) Awareness activities at Shimoga district	28-03-2022	Anavatti, Sorabha Division,	Public, College students	400	Cleanliness drive and awareness activities conducted on theme "Prevent littering" in Government First Grade College, Anavatti in association with Forest Department, Assistant Conservator of Forest, Sorabha Sub Division. Documentary videos on different themes of environmental themes were shown to the students. Handouts on "banned single use plastic items" were circulated to the public.

Sl. No	Dates of the campaign	Location	Target group	No of Participants	Summary
4	01-08-2021 to 31-03-2022	Kodi and M Kodi beaches of Udupi district	Public	10000+	Cleaning of beaches & awareness activities at beaches was conducted on a daily basis by the cleaning staff. Collected waste materials including plastic items were disposed with concerned authority.
5	05-03-2022	Bisileghat, Sakaleshpura of Yasaluru division & Hassan division	Public	225	Cleanliness and awareness activities were conducted in association with Deputy Conservator of Forests, Karnataka Forest Department, Hassan at roadsides of Mangaluru-Subramanya National highway, Yasaluru and Hassan divisions. 200 bags of waste were collected in Yasaluru division and delivered to the concerned authority for disposal. Staff of Forest Department and Public participated in the cleanliness drive.
6	March 2022	34 Educational districts	Eco-club students	3400	District level essay competitions on the theme "Energy Conservation" was conducted to the students of 34 Educational Districts. Cash prize was awarded to 3 winners in each district.

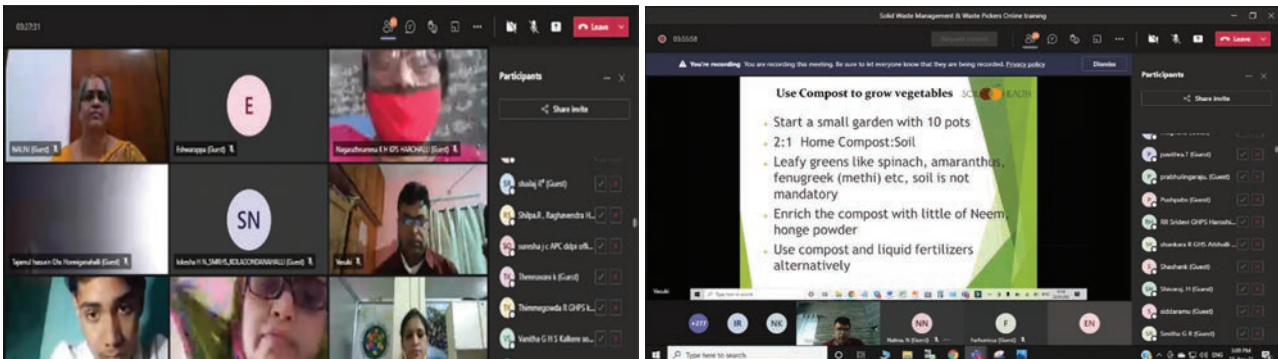
J. Meetings conducted during the year under NGC programme

Sl. No	Date	Details of activities	Participants	Location	Summary
1	25-10-2021	State Steering Committee (SSC) meeting	Members of SSC	MS Building Bangalore	In the meeting, proceedings and action taken report of previous SSC meeting were noted and confirmed. The committee reviewed the progress, approved the action plan and the budget of NGC programme for the year 2021-22.
2	February 2022 To April 2022	District Implementation & Monitoring Committee (DIMC) meetings in districts	DIMC members of respective districts	Deputy Commissioner officers of Belgaum & Chikkodi, Udupi, Davanagere, Vijayapura, Kolar, Ramanagara, Tumkur & Madhugiri, Chitradurga, Mandya, Chikkaballapura, Haveri, Koppal, Chamaraj nagar	Discussion was held on effective implementation of NGC programme at district level.

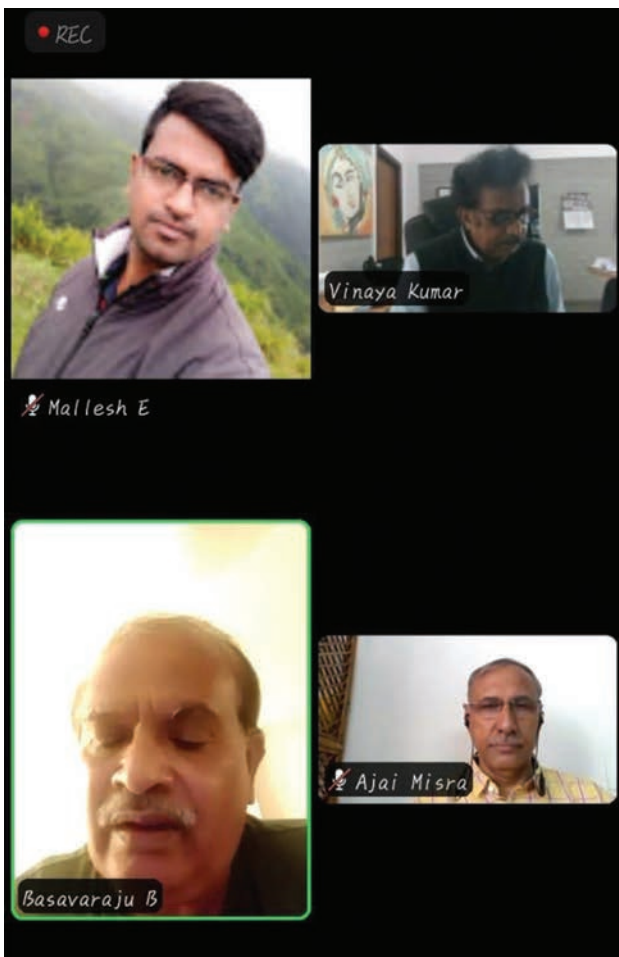
K. Visit to schools by NGC team

Date	Name of the Eco-club Schools	District	No. of schools	
17-08-2021 to 21-08-2021	1. Sarvajanika High School, Belakavadi	Mandya	7 Eco-club schools	
	2. Jnanasurya high school, Belakavadi			
	3. GMHPS, Belakavadi			
	4. GHS, B.G.Pura			
	5. GHPS, B.G.Pura			
	6. GHS, Saraguru			
	7. TSS, Sarvajanika High School, Belakavadi			
		8. GHS, Mullur	Chamarajanagara	4 Eco-club schools
		9. GHPS, Hosamalangi		
		10. GHS, Hosamalangi		
		11. GHPS (Upgraded) Tagarapura		
04-10-2021 to 08-10-2021	12. GHPS, Sathanuru	Bangalore North	6 Eco-club schools	
	13. GMHPS, Bengaluru			
	14. GHPS, Marenahalli			
	15. GHPS, Mylanahalli			
	16. GHPS, Maralakunte			
17. KPS, link road, Sheshadripuram				
05-11-2021 to 11/- 11-2021	18. Rural High School, Harohalli	Ramanagara	7 Eco-club schools	
	19. GGMS, Kanakapura town			
	20. Ex-Municipal GHS, Kanakapura			
	21. GGHS, Kanakapura			
	22. RGHS, Kanakapura			
	23. RMHS, Kanakapura			
	24. GHS, Shivanahalli			
		25. GHS, Chikkabagilu	Mandya	5 Eco-club schools
		26. GHS, Nelligere		
		27. GHS, Doddaboohalli		
		28. GHS, Ravani		
29. Adarsh Vidyalaya, Malavalli				
	30. GHS, Mulluru	Chamarajanagara	9 Eco-club schools	
	31. GHPS, Kempanapalya			
	32. St.Francis Assisi High School, Kollegal,			
	33. Govt.S.V.K girls PU College (high school section), Kollegal			
	34. MCKC High School, Kollegal			
	35. Adarsha Vidyalaya, Kollegal			
	36. GHPS, Mudigunda			
	37. JSS high School, Mudigunda			
	38. GHPS(Upgraded) Bannisarige			
Total visited eco club Schools			38 Eco-club Schools	

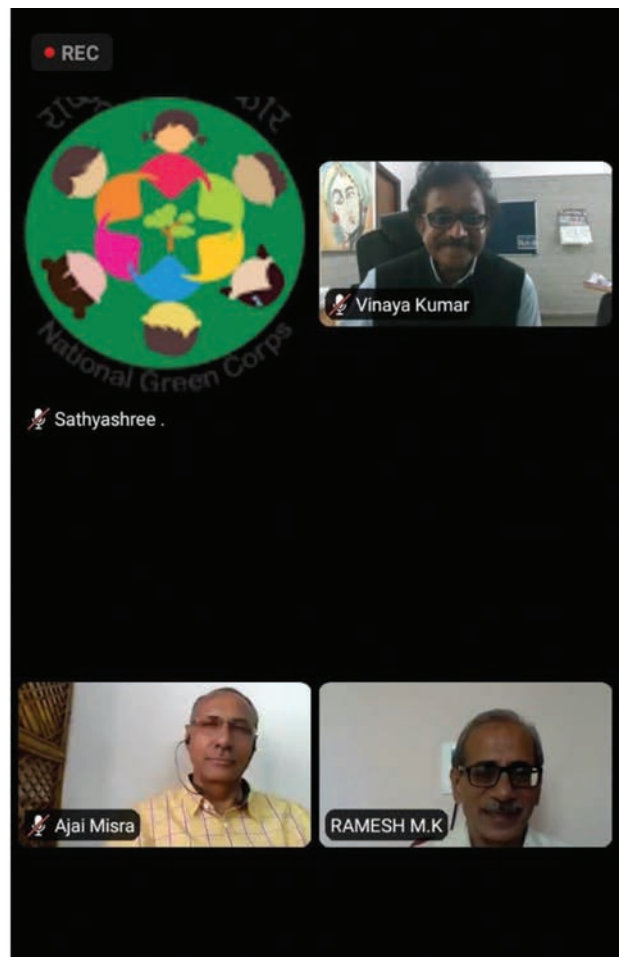
L. Photo Gallery –National Green Corps - Activities /Programmes under National Green Corps for theyYear 2021-22



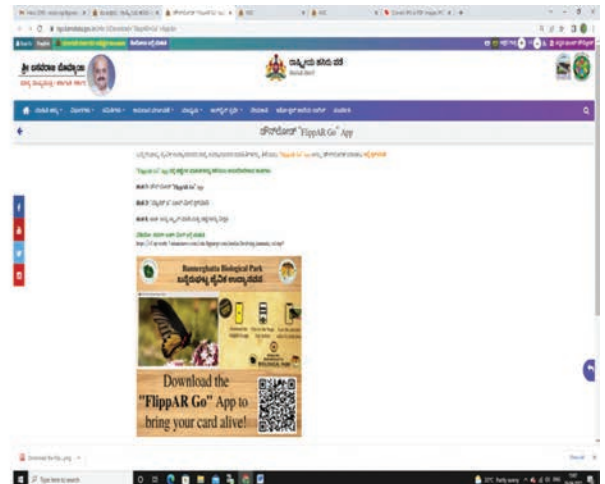
Webinar on Solid Waste Management on World Earth Day 2021



Keynote address by Shri Ajay Mishra IFS, PCCF(wildlife)(Retd.) on World Environment Day Celebration- 2021



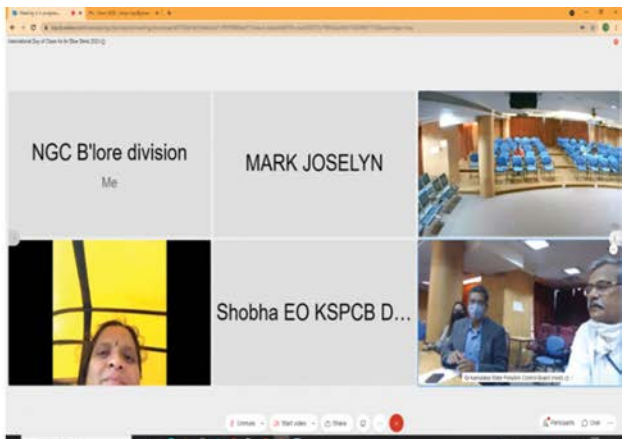
Address by Dr.K.H.Vinaya Kumar, IFS, Director (Research) (in charge) EMPRI on World Environment Day Celebration- 2021



Information of Bannerghatta Biological Park on NGC website



Turmeric Ganesha Campaign in Kodagu district



Webinar on International Day of Clean Air for Blue Skies



Launch of One Earth One Home Programme by WWF India



Inaugural Function



Students participating in the competitions students



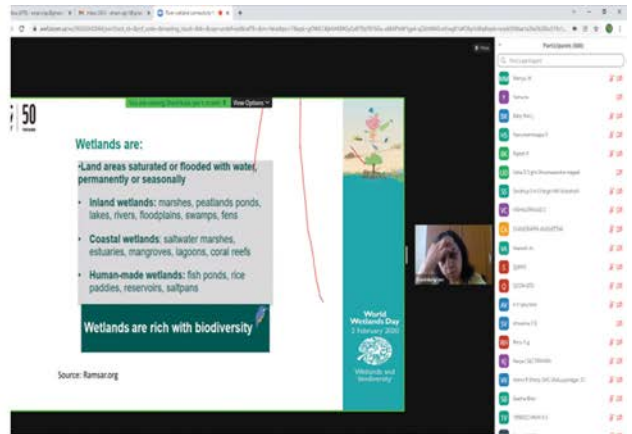
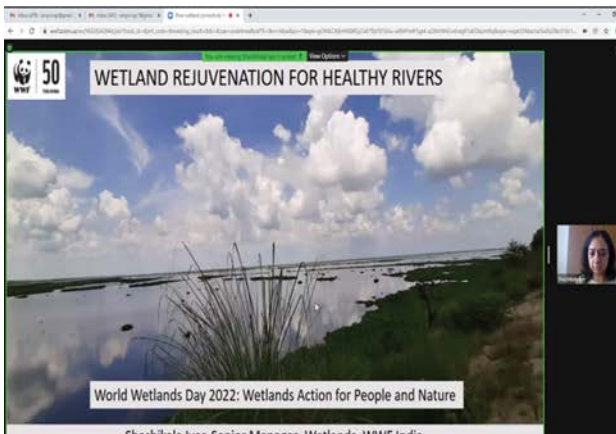
Key note speech by Dr. K. H. Vinayakumar IFS, (Retd.), Director (Research)



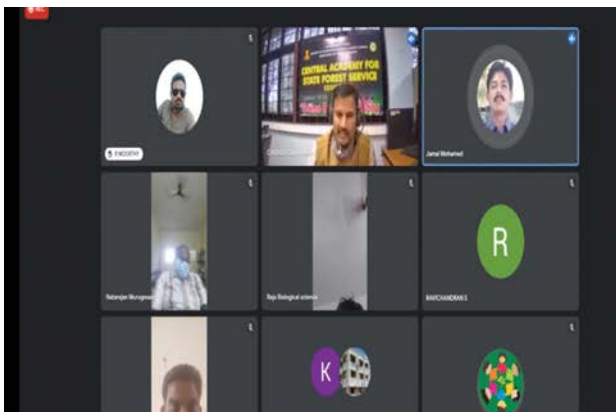
Address by Shri. T. Balachandra, IFS, (Retd.) In charge Malleshwaram Project Office



Selfie with daughter online campaign



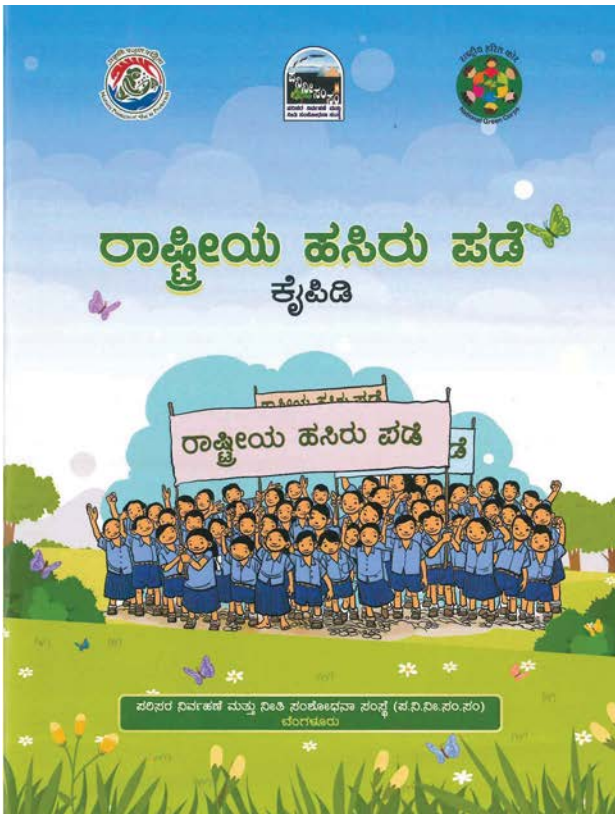
Webinar on World Wetland Day 2022



Online training on General awareness course on Conservation of Forests, Wildlife and Environment- Coimbatore



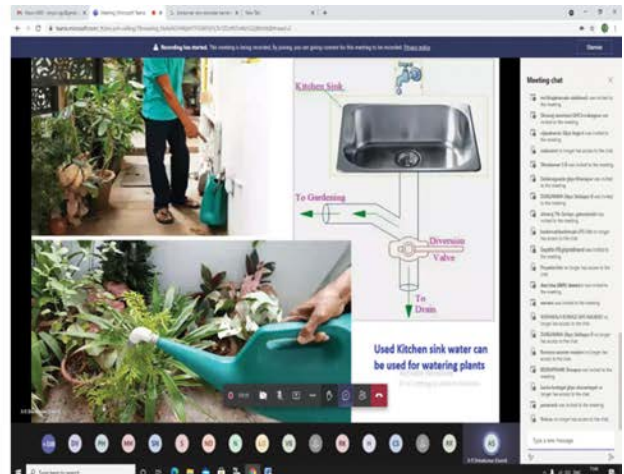
Operationalization of NGC Web Application in schools and districts



NGC hand book & Makkala Chandada Parisara book



NGC hand book & Makkala Chandada Parisara book

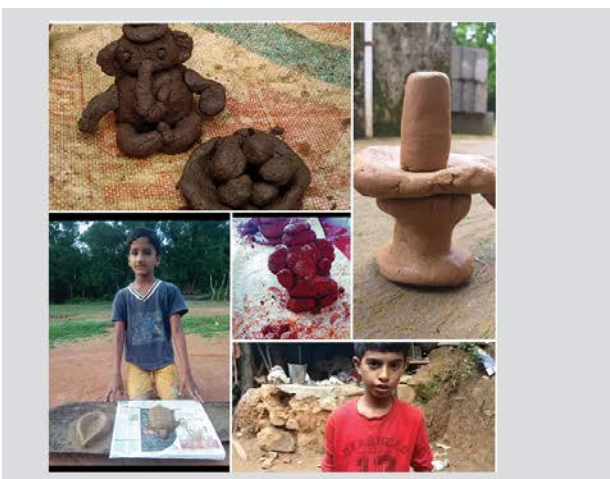


Webinar on Rain Water Harvesting



Nature Walk at Doresanipalya Reserve Forest, Bangalore

Zadi Ka Amrut Mahotsav Activities - Bharat ka amrut mahotsav – 75 green good deed activities in eco-club schools



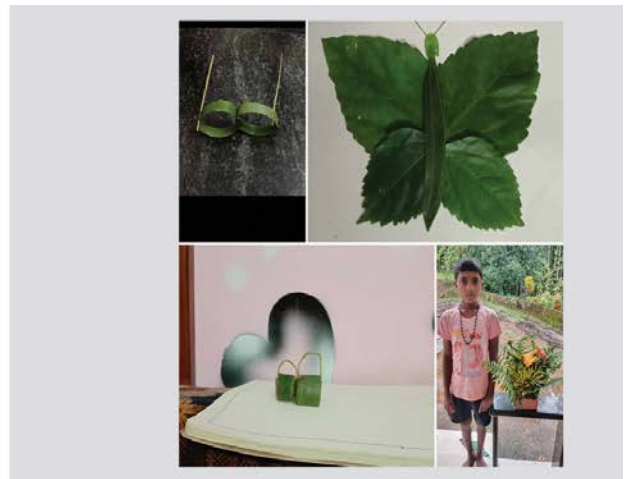
Clay art by-club students



Craft work by eco-club students



Awareness campaign by eco-club students



Leaves crafts by eco-club students

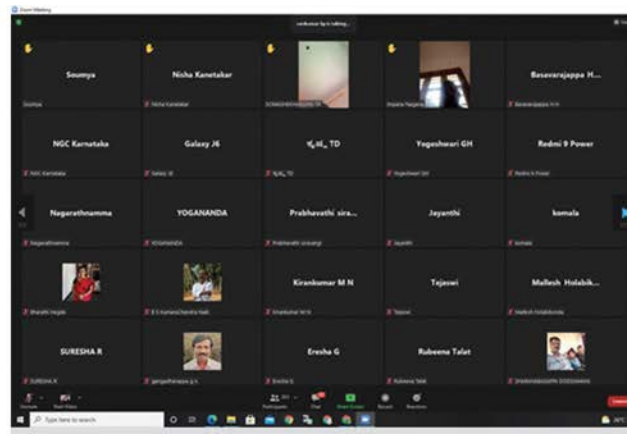
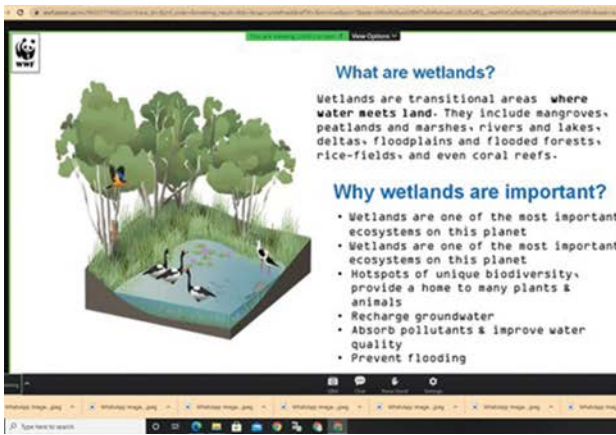


Drawings by eco-club students



Activities at Eco-club schools during green good deed of the week campaign





Online Webinars



Online Competitions on wetland conservation



Drawing by winner of the drawing competition

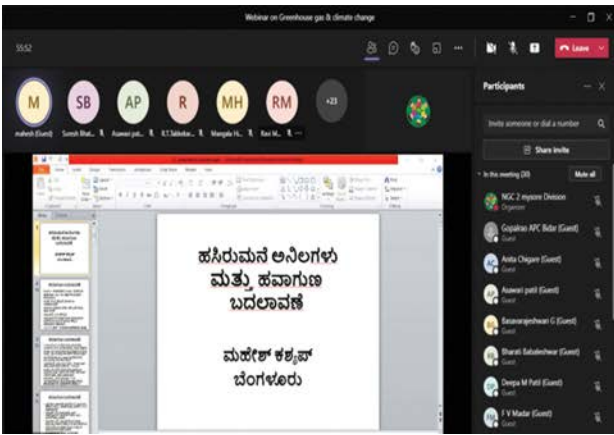
Azadi Ka Amrut Mahotsav Celebration Iconic Week 4th To 10th October 2021



Webinar on Awareness about Plastic usage



Webinar on lake/ wetland/ water conservation



Webinar on Greenhouse gas & climate change



Webinar on Wildlife Conservation



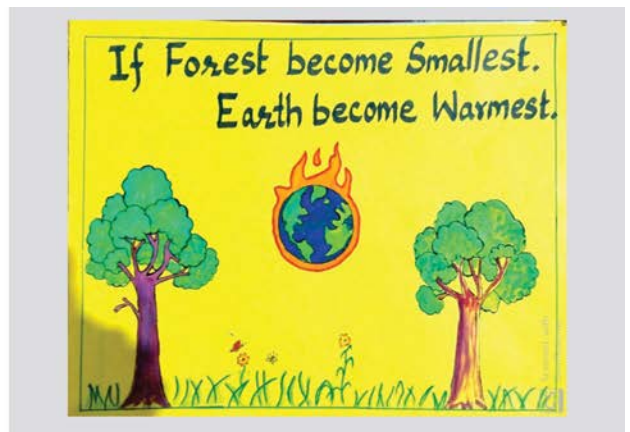
Webinar on Forest Conservation/
Afforestation



Craft competition on the theme "Reuse of plastic"



Poster making competition on the theme "wildlife conservation"



Slogan writing competition on the theme "Afforestation"



Distribution of cotton bags & eco-friendly dust bins to Eco-club schools, Bangalore North district

ಮಂಡಾಪುರ ಪುರಸಭೆಯು ಫಲಶ್ವಾಸ್ಯ ವಿಲೇವಾರಿ ಘಟಕಕ್ಕೆ ಸರ್ಕಾರಿ ಪದವಿ ಪೂರ್ವ ಕಾಲೇಜಿನ ವೃತ್ತ ಕಾಲೇಜಿ ವಿಭಾಗದ ವಿದ್ಯಾರ್ಥಿಗಳು ಬೇಟೆ ನೀಡಿ, ಅಧಿಕಾರಿಗಳಿಂದ ಮಾಹಿತಿ ಪಡೆಯಿತು.

ತ್ಯಾಜ್ಯ ನಿರ್ವಹಣೆ: ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಮಾಹಿತಿ

ಮಂಡಾಪುರ: ಪುರಸಭೆ ವ್ಯಾಪ್ತಿಯಿಂದ ಪ್ರತಿ ದಿನ ಸಂಗ್ರಹವಾಗುವ 130ರಿಂದ 15 ಲಕ್ಷ ಕಸವನ್ನು, ಯಂತ್ರಗಳ ಸಹಾಯದಿಂದ ಪ್ರತ್ಯೇಕವಾಗಿ ವಿಂಗಡಣೆ ಮಾಡಲಾಗುತ್ತಿದೆ. ದಿನಕ್ಕೆ 4 ಟನ್‌ನಷ್ಟು ಕಸ ಕಸವನ್ನು ವ್ಯವಸ್ಥಿತವಾಗಿ ಬೀರ್‌ಡಿಸಿ 45 ದಿನಗಳ ಕಾಲ ವ್ಯವಸ್ಥಿತ ಮಾಡಿದರಲ್ಲಿ ಇರಿಸಿ ಗೊಟ್ಟುಬಾಗಿ ಪರಿವರ್ತನೆ ಮಾಡಿ ಕೃಷಿಗಾಗಿ ಮಾರಾಟ ಮಾಡುತ್ತಿದ್ದೇವೆ ಎಂದು ಪುರಸಭೆ ಮುಖ್ಯಾಧಿಕಾರಿ ಗೋಪಾಂಕಪ್ಪ ಕಟ್ಟಿ ಹೇಳಿದರು. ಪುರಸಭೆ ಅಧ್ಯಕ್ಷ ವಿಣಾ ಭಾಸ್ಕರ ಮಂಡಣೆ ಮಾತನಾಡಿ, 'ತ್ಯಾಜ್ಯ ವಿಲೇವಾರಿಯ ಬಗ್ಗೆ ಪ್ರತಿಯೊಬ್ಬರನ್ನೂ ಸ್ವಯಂ ಜಾಗೃತಿ ಆಗುತ್ತ, ಸುಂದರ ನಗರ ನಿರ್ಮಾಣಕ್ಕೆ ಕೈ ಹೆಣೆದು, ತ್ಯಾಜ್ಯ ನಿರ್ವಹಣೆಯಲ್ಲಿ ಕನ ವಿಲೇವಾರಿ ಪಾತ್ರ ಪ್ರಮುಖವಾಗಿದೆ' ಎಂದರು. ಪುರಸಭೆ ಉಪಾಧ್ಯಕ್ಷ ಸಂದೀಪ್ ಪಾರ್ವಿ, ನಗರಾಭಿವೃದ್ಧಿ ಪ್ರಾಧಿಕಾರದ ಮಾಜಿ ಅಧ್ಯಕ್ಷ ಕೆ.ವಿ.ಕಾಣ್ ಹೆಗ್ಡೆ, ಕಾಲೇಜಿನ ದೈಹಿಕ ಶಿಕ್ಷಣ ಶಿಕ್ಷಕ ಪ್ರಕಾಶ್‌ಕುಮಾರ್ ಕಟ್ಟಿ ಸದಸ್ಯ ಪುಷ್ಪ ಕೇಟ್, ಪರಿಶರ ಎಂಜಿನಿಯರಿಂಗ್ ಗುರುಪ್ರಸಾದ್ ಕಟ್ಟಿ, ಕಂದಾಯ ನಿರೀಕ್ಷಕಿ ಜ್ಯೋತಿ, ಆರೋಗ್ಯ ನಿರೀಕ್ಷಕಿ ರಾಘವೇಂದ್ರ ನಾಯಕ್, ಗಣಿತ ಉಪಾಧ್ಯಕ್ಷ ಇದ್ದರು.

Energy conservation & environment protection education programs

District Implementation & Monitoring Committee (DIMC) Meetings 2021-22



DIMC Meeting in Chitradurga district



DIMC Meeting in Dharwad district



DIMC Meeting in Davanagere district



DIMC Meeting in Kolar district



DIMC Meeting in Ramanagara district



DIMC Meeting in Udupi district

School Visit By NGC Team



Activities /programmes under swachhta action plan for the year 2021-22
Theme 1. Awareness on curbing the Single Use Plastic



Cleaning & Awareness activities at beaches in Dakshina Kannada & Udupi districts



Awareness activities on curbing the single use plastics in Shimoga district



Cleanliness drive in Chikkaballapura district



ಬಿಳಿಗಿರಿರಂಗನ ಬೆಟ್ಟ: ಪ್ಲಾಸ್ಟಿಕ್ ಸಂಗ್ರಹ

ಧರ್ಮಾಚಾರ್ಯ ವಾತ್

ಯಳಂದೂರು: ತಾಲ್ಲೂಕಿನ ಬಿಳಿಗಿರಿರಂಗನ ಬೆಟ್ಟದಲ್ಲಿ ನಡೆಯುವ ಪ್ಲಾಸ್ಟಿಕ್ ಸಂಗ್ರಹವನ್ನು ಸಂಗ್ರಹಿಸುವ ಅರಣ್ಯ ಇಲಾಖೆ ಸ್ವೀಕರಿಸಿ ಕನಿಷ್ಠ ಮೂಲಾಧಾರವು.

ಅಲ್ ಎಫ್. ಲೋಕೇಶ್ ಮೂರ್ತಿ ಮಾತನಾಡಿ, 'ಬಿಆರ್ ಪ್ಲಾಸ್ಟಿಕ್ ಮತ್ತು ಅಭಿಯಾನವು, ಅರಣ್ಯ ಇಲಾಖೆ ಮಾರಾಟ ಮತ್ತು ಬಳಕೆ ಸಂಸ್ಥೆಯೊಂದಿಗೆ ನಡೆಯಲಾಗಿದೆ. ಆದರೂ, ಬೆಟ್ಟದ ಸುತ್ತಮುತ್ತ ಅಂಗಡಿಗಳಲ್ಲಿ ಮಾರಾಟ ಮತ್ತು ಉಪಯೋಗಕ್ಕೆ ಎಲ್ಲೆಡೆ ಸಾಗಿದೆ. ಇದನ್ನು ಕಂಡು ಬಂದಾಗಲೇ ಈ ಬಾರಿ ಸಂಸ್ಥೆಯು ಅನುಪಯುಕ್ತ ಪ್ಲಾಸ್ಟಿಕ್ ವಸ್ತುಗಳ ಮಾರಾಟದ ಸಂಖ್ಯೆ ನಿರೀಕ್ಷಿಸಿ ಸುಸ್ಥಿರ ಸಮಾಜವನ್ನು ಸೃಷ್ಟಿಸಲು ಸಹಾಯ ಮಾಡಲಾಗಿದೆ.

ಯಳಂದೂರು ತಾಲ್ಲೂಕಿನ ಬಿಳಿಗಿರಿರಂಗನ ಗಿರಿವಾರದಲ್ಲಿ ಅರಣ್ಯ ಇಲಾಖೆ ಸ್ವೀಕರಿಸಿ ಮತ್ತು ವಿದ್ಯಾರ್ಥಿಗಳು ಅನಿವಾರ ಪ್ಲಾಸ್ಟಿಕ್ ಕಳೆ ಸಂಗ್ರಹ ಮಾಡಿದರು.

ಮೂಲಿಸಲಾಗುತ್ತಿದೆ. ಸ್ವಯಂ ಸೇವಕರು ಬೆಲೆ ಮಾರಾಟ ಹಾಗೂ ಬಳಕೆ ಮತ್ತು ಅಲಾಪಗಳ ಸಹಕಾರದಿಂದ ಮಾನವರ ವಿರುದ್ಧ ಸ್ಥಳದಲ್ಲಿ ಪ್ಲಾಸ್ಟಿಕ್ ಪ್ಲಾಸ್ಟಿಕ್ ಸಂಗ್ರಹಿಸಿ, ದಂಡ ಹಾಕುವ ಪ್ರಕ್ರಿಯೆಗೆ ಬಾಕಿ

Cleaning & awareness activities at BRT Tiger Reserve, Chamarajanagara district



Awareness through street plays in Mandya district



Cleanliness drives & Awareness activities in Tumkur district



Awareness activities in Chitradurga district



Distribution of eco-friendly dust bins, cotton bags at Government Boys high school, Malleshwaram



Competitions at eco-club schools



Awareness campaign in Chikkaballapura district



Awareness campaign in Bangalore city



Cleaning and awareness activities at BWSSB office campus, Malleshwaram



Before cleaning

After cleaning



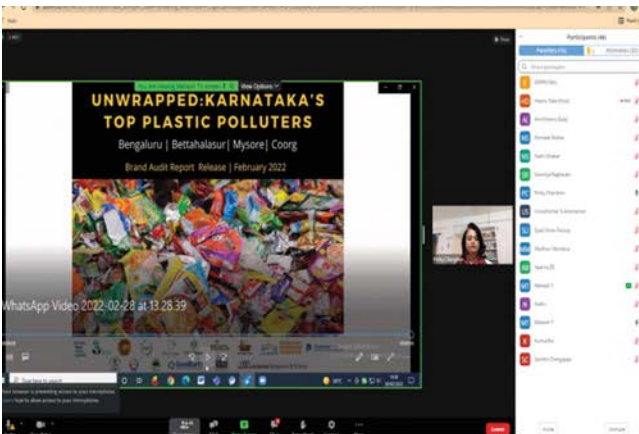
Awareness campaign at public places



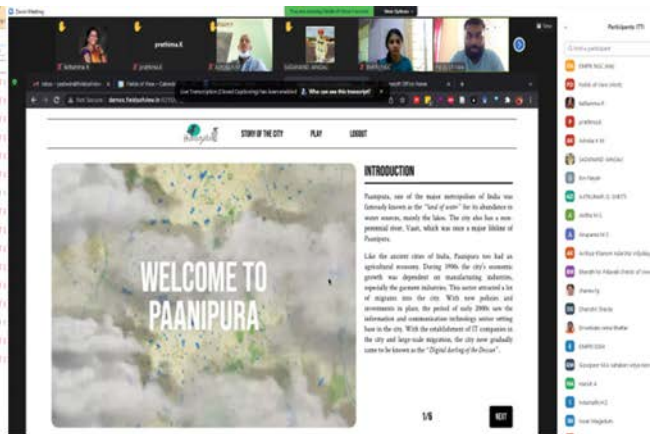
Cleanliness drive at Malleshwaram, Bangalore



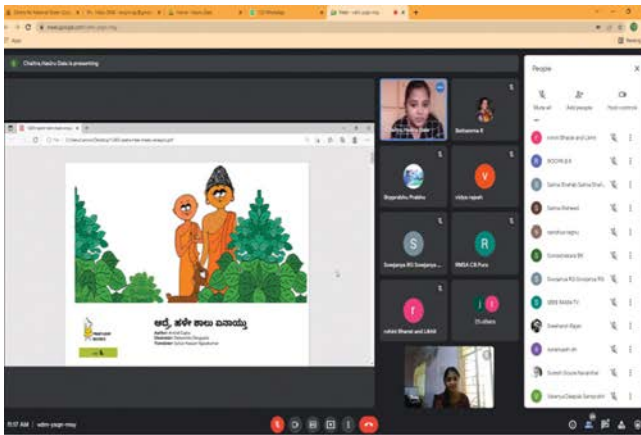
Awareness campaign at public places and eco-club schools



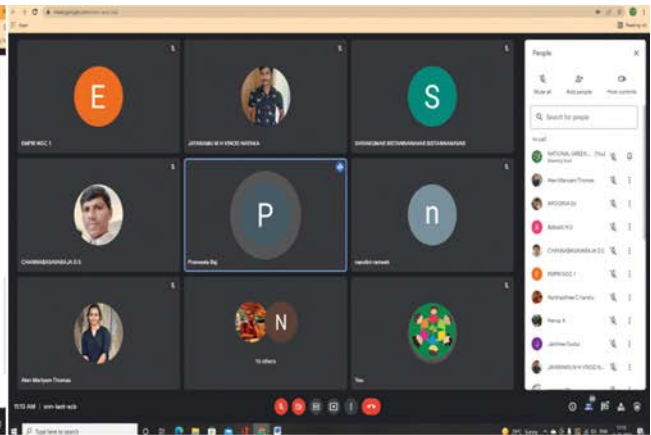
Webinar on "Who are Karnataka's top polluters?"



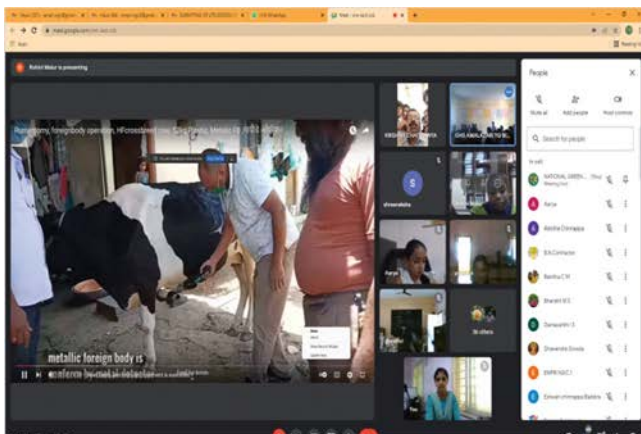
Webinar on Awareness on water conservation



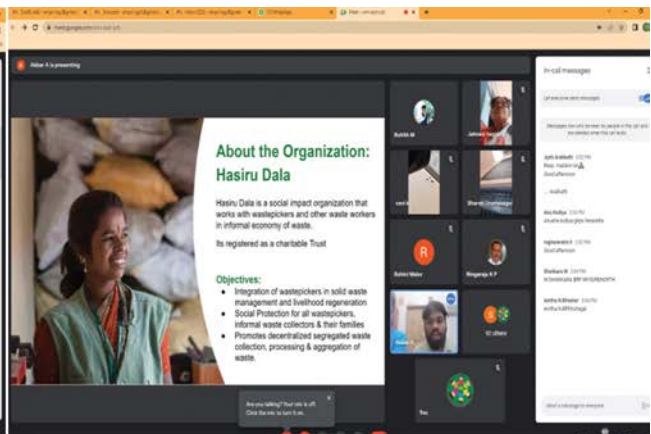
Webinar on Awareness on recycling of waste



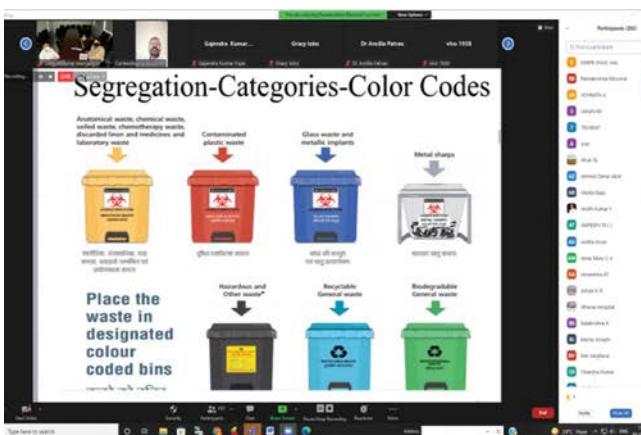
Webinar Session on Trashonomics



Webinar on Going green begins at home

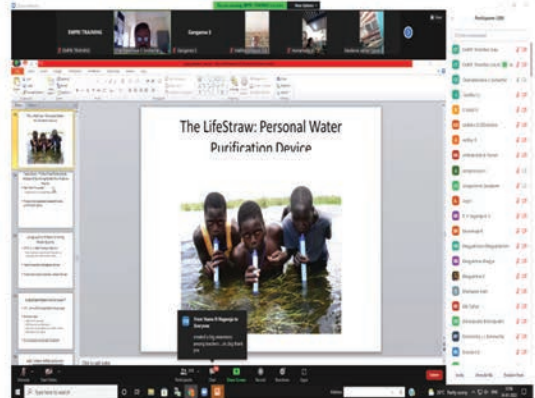
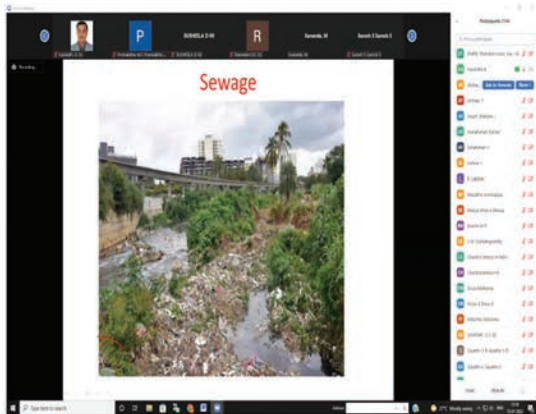
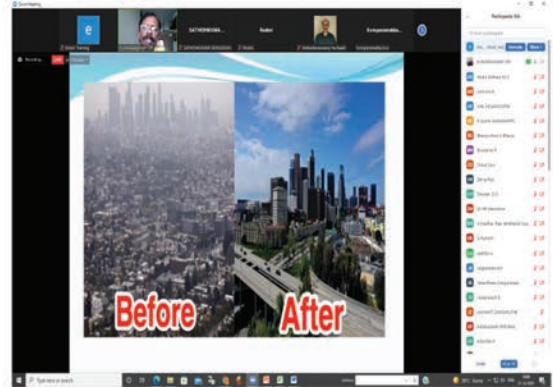
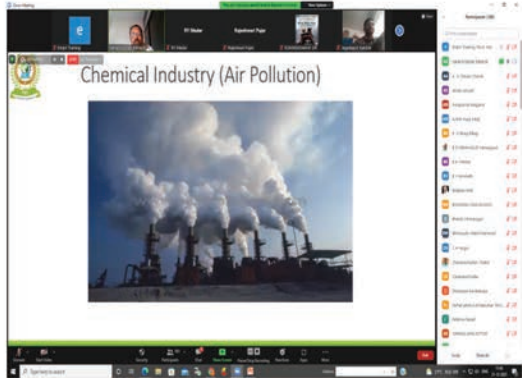


Webinar session on climate adaption



Trainings on awareness on Biomedical Waste disposal

Theme 2. Awareness on air and water pollution



Webinars on awareness on Air and Water pollution



ಪ್ಲಾಸ್ಟಿಕ್ ಕಸದ ಬುಟ್ಟಿಗೆ ಹಾಕಲು ಮನವಿ

ಪ್ಲಾಸ್ಟಿಕ್ ಪರ್ಯಾಯ ಕುರಿತು ಮಾತನಾಡಿದ ಏಡುಕೊಂಡಲು

• ಕಸದತ್ತ ಭ ವಾರ್ತೆ ಹೆಸರಾಯ

ಮಲಮಹಾದೇವರ ಬಟ್ಟೆ ಕಾಲಡಿಗೆಯಲ್ಲಿ ಹಾಗೂ ವಾಹನಗಳಲ್ಲಿ ತೆರಬಹಿ ಛತ್ರರು ವಸ್ತು ಜೀವಿ ಅರಣ್ಯ ಪ್ರದೇಶದಲ್ಲಿ ಪ್ಲಾಸ್ಟಿಕ್ ಬಿಸಾಡದೇ ಕಸದ ಬುಟ್ಟಿಗಳಲ್ಲಿ ಹಾಕಬೇಕೆಂದು ಮಲಮಹಾದೇವರ ವಸ್ತು ಜೀವಿ ವಿಭಾಗದ ಡಿಸಿಎಸ್ ಏಡುಕೊಂಡಲು ಹೇಳಿದ್ದಾರೆ.

ಮಲಮಹಾದೇವರ ವಸ್ತು ಜೀವಿ ವಿಭಾಗದ ಕೌಡಲ್ ಸಂಕಲನಕ್ಕೆ ಬಗ್ಗೆ ಅರಣ್ಯ ಇಲಾಖೆ ವಿವಿಧ ಸಂಘ ಸಂಸ್ಥೆಗಳ ಸಹಯೋಗದೊಂದಿಗೆ ಪ್ಲಾಸ್ಟಿಕ್ ಪರ್ಯಾಯ ಪದ್ಧತಿಗಳ ಬಗ್ಗೆ ಹಮ್ಮಿಕೊಂಡಿದ್ದು ಲಾಭ ಮುಟ್ಟುರಣಿಯು ಗಾಂಧಿ ಉದ್ಯಾನವನ ಮಾತನಾಡಿದರು.

ಛತ್ರರು ಪ್ರೀಕ್ಷಿತ ಕೃಷಿ ಬಟ್ಟೆ ಪ್ಲಾಸ್ಟಿಕ್ ಬುಟ್ಟಿ ಗಳು ಹಾಗೂ ಪ್ಲಾಸ್ಟಿಕ್ ಪದ್ಧತಿಗಳನ್ನು ತಮ್ಮಲ್ಲಿ ಇಟ್ಟುಕೊಂಡು ಇಲಾಖೆ ವತಿಯಿಂದ ಅಲ್ಲಲ್ಲಿ ಇಟ್ಟಿರುವ ಕಸದ ಡಬ್ಬುಗಳಲ್ಲಿ ಹಾಕುವುದರಿಂದ ಅದನ್ನು ನಾವು ಜೀವಿ ವಿಲಂಬಣಿ ಮಾಡ



ಹೂಡಲು ಮಲಮಹಾದೇವರ ವಸ್ತು ಜೀವಿ ವಿಭಾಗ ವಿವಿಧ ಸಂಘ ಸಂಸ್ಥೆಗಳ ಸಹಯೋಗದೊಂದಿಗೆ ಹಮ್ಮಿಕೊಂಡಿದ್ದ ಪ್ಲಾಸ್ಟಿಕ್ ಪರ್ಯಾಯ ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ಭಾಗವಹಿಸಿದ್ದ ಸ್ವಯಂ ಸೇವಕರು.



Awareness activities at Malai Mahadeswara hill, Chamarajanagar District

Environmental Management & Policy Research Institute (EMPRI)
National Green Corps Karnataka
Swachhata Action Plan(SAP)

2022 Eco-Friendly New Year's Resolutions

Jan 15th to Feb 14th

Entry:

- Tell us "How to create sustainable 2022 by taking innovative ecofriendly resolutions during this new-year?" using hashtag #SustainableKarnataka and #NGCEcoClub on Twitter.
- Follow our official twitter page.
- Tag us on your post.
- Ask your friends and family to like your posts.

Terms & Conditions

- The posts with most likes will be the winner - **1st, 2nd and 3rd Prizes will be Rs. 5,000, Rs. 3,000 and Rs. 2,000 respectively.**
- Only the residents of Karnataka State are eligible
- The competition will be held from 15th Jan to 14th Feb 5.00 PM.
- You must be following our official handle.
- You must use the hashtags given for the competition.
- Posts with auto Likes will be disqualified.
- Only one entry per person is allowed.

BE CREATIVE AND SAVE THE PLANET!

NGCKarnataka

Environmental Management & Policy Research Institute (EMPRI)
National Green Corps Karnataka
Swachhata Action Plan(SAP)

SUSTAINABLE HOME DÉCOR

DIY ONLINE COMPETITION

Entry:

- Upload minimum of 3 Pictures and 1 Video (30sec - 1min) of your **Do It Yourself Home Décor on Instagram.**
- Sustainable home decor means using wastematerials for creating sustainable decorative and aesthetic material.
- A short **description** on how you made it and what change it brought to the environment, also highlight if you are creating awareness on single use plastic.
- Follow **@NGCKarnataka** Instagram page.
- Use the hashtags : #SustainableKarnataka , #CreativitySavesThePlanet and #NGCEcoClub

Rules:

- The competition will be held from 15th Jan to 14th Feb 5.00 PM.
- Only the residents of Karnataka State are eligible
- The posts with most likes will be the winners - 1st, 2nd and 3rd Prizes will be Rs.5,000, Rs.3,000 and Rs.2,000 respectively.**
- You must be following our official Instagram handle.
- You must use the hashtags given for the competition.
- Posts with auto Likes will be disqualified.
- Only one entry per person is allowed.

15th JAN - 14th FEB 2022

BE CREATIVE AND SAVE THE PLANET!

NGCKarnataka

Environmental Management & Policy Research Institute (EMPRI)
National Green Corps Karnataka
Swachhata Action Plan(SAP)

Eco-friendly Gardening Competition' 22

Jan 15th - Feb 14th

Entry:

- Upload 3 Pictures and 1 Video (30sec - 1min) of your Home Garden on Facebook.**
- Describe** the ways how you adopted sustainable practices to make your garden eco-friendly.
- Follow **@NGCKarnataka** facebook page.
- Use the hashtags : #EcofriendlyGardening #SustainableKarnataka and #NGCEcoClub

Rules:

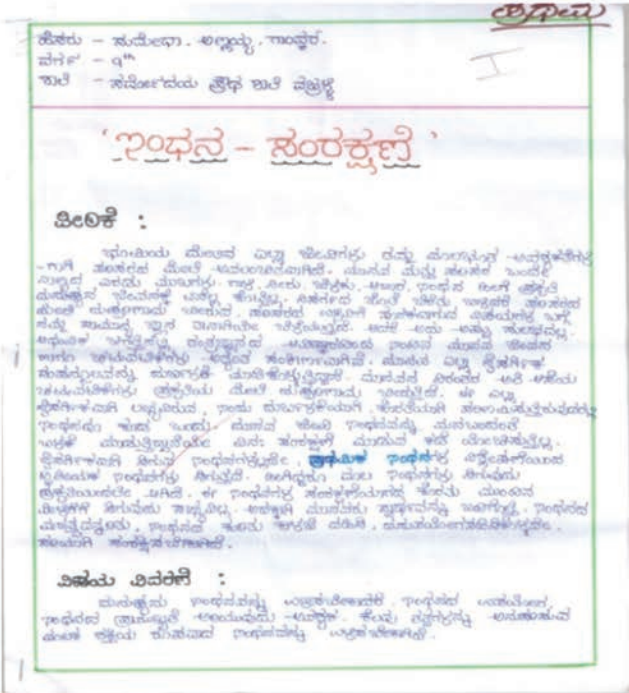
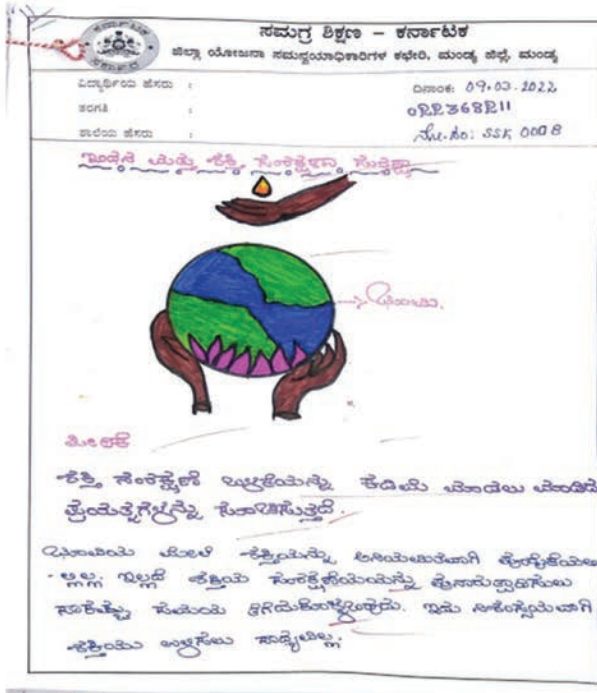
- Must be following eco-friendly gardening practices.
- Only the residents of Karnataka State are eligible
- The competition will be held from 15th Jan to 14th Feb 5.00 PM.
- The posts with most likes will be the winner - **1st, 2nd and 3rd Prizes will be Rs. 5,000, Rs.3,000 and Rs.2,000 respectively.**
- You must be following our official facebook handle.
- You must use the hashtags given for the competition.
- Posts with auto Likes will be disqualified.
- Only one entry per person is allowed.

BE CREATIVE AND SAVE THE PLANET!

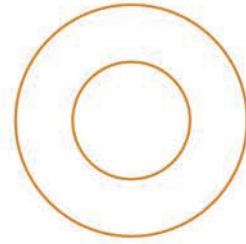
NGCKarnataka



Online competitions through NGC social media sites



District level essay competitions on the theme “Energy conservation”



CHAPTER - 3
**HUMAN
RESOURCES**



3.1 OFFICERS ON DEPUTATION FROM GOVERNMENT OF KARNATAKA AND KARNATAKA STATE POLLUTION CONTROL BOARD

Sl.	Name	Designation	Date of joining	Date of leaving
1	Shri. Raj Kishor Singh IFS, Principal Chief Conservator of Forests	Director General	25-03-2021 Additional Charge	13-10-2021
2	Shri. Jagmohan Sharma IFS Additional Principal Chief Conservator of Forests	Director General	13-10-2021	-
3	Director	Vacant	-	-
4	Director (Research)	Vacant	-	-
5	Shri. T. Mahesh	Chief Environmental Officer, Karnataka State Pollution Control Board	02-12-2020 (Concurrent Charge)	-
6	Smt. Nausheen Jabeen	Gazetted Manager	22.05.2017	-

3.2 EMPRI FELLOW:

Government of Karnataka issued an order (FEE 43 ENV 2019, Bengaluru, dated:19-11-2019) for establishing Climate Change Peetha and Environmental Management and Conservation Peetha by selecting EMPRI fellows for each peetha. Details of EMPRI fellows are given below.

Sl. No.	Name	Designation	Date of joining	Date of leaving
1	Dr. K.H. Vinayakumar IFS, (Rted)	EMPRI Fellow-Environment	21-08-2020	-
2	Dr. Deepika Swami	EMPRI Fellow Climate Change	01-10-2020	22-12-2021
3	Dr. Thejaswini M.E.	EMPRI Fellow Climate Change	07-02-2022	-

3.4 DETAILS OF OUTSOURCED EMPLOYEES-2021-22

3.3.1. Employees have been outsourced through manpower agency for carrying out various projects (as on 31st March 2022).

Sl. No.	Positions	Centre for Climate Change	Centre for Lake Conservation / Water analysis Lab	Centre for Capacity Building	NGC-*1	ENVIS- *2	CFEW-*3	Conducting Carrying Capacity Study for New Tyre Pyrolysis	Total
1	Project Coordinators	-	1	-	-	-	1	-	2
2	Sr. Consultant	1	-	-	-	-	-	-	1
3	Research Scientists	3	1	-	-	-	2	-	6
4	Project Scientist	-	-	-	-	-	2	-	2
5	Research Associates	3	2	-	-	-	3	-	8
6	Functional Area Expert	-	-	2	-	-	-	-	2
7	Functional Area Associate	-	-	2	-	-	-	-	2
8	Jr. Research Fellow	1	-	-	-	-	-	-	1
9	Project Associates	16	3	-	-	-	8	3	30
10	Project Assistant	5	1	-	-	-	3	1	10
11	Technical Assistants	-	2	-	-	-	1	-	3
12	Lab Chemists	1	1	-	-	-	-	-	2
13	Lab Technicians	2	1	-	-	-	-	-	3
14	Training Head	-	-	1	-	-	-	-	1
15	Training Associates	-	-	2	-	-	-	-	2
16	Training Assistants	-	-	2	-	-	-	-	2
17	Programme Officers	-	-	-	1	1	-	-	2
18	Information Officer	-	-	-	-	1	-	-	1
19	IT Officer	-	-	-	-	1	-	-	1
20	Programme Associates	-	-	-	2	-	-	-	2
21	IT Assistant	-	-	-	1	-	-	-	1
22	Field Assistants	-	1	-	-	-	6	-	7
23	Lab Attenders	2	1	-	-	-	-	-	3
24	Dalayat	-	-	-	1	-	-	-	1
25	Security	-	-	-	3	-	-	-	3
	Total	34	14	9	8	3	26	4	98

*1:- NGC-National Green Corps, *2:ENVIS- Environmental Information System, *3:- CFEW- Centre for Forestry Ecology and Wildlife

3.3.2. Employees have been outsourced through manpower agency for the office management (as on 31st March, 2022).

Sl. No.	Positions	Administration	Accounts	Library	Total
1	Manager	1	-	-	1
2	System Administrator	1	-	-	1
3	Librarian	-	-	1	1
4	Office Assistant	1	-	-	1
5	Stenographer/Data Entry Operator	1	-	-	1
6	Account Assistant	-	1	-	1
7	Jr. Account Assistant	-	1	-	1
8	Drivers	5	-	-	5
9	Dalayaths	4	-	-	4
10	Housekeeping	3	-	-	3
11	Security	4	-	-	4
	Total	20	2	1	23

3.3.3. Number of outsourced employees who have resigned from the service of EMPRI /worked for short period project

Sl. No.	Positions	Centre for Climate Change	Centre for Lake Conservation/ Water Analysis Lab	Centre for Capacity Building	NGC	ENVIS	CFEW	Accounts	Total
1	Senior Consultant	1	-	-	-	-	-	-	1
2	Empri Fellow Climate Change	1	-	-	-	-	-	-	1
3	Training Head	-	-	1	-	-	-	-	1
4	Project Associate	3	-	-	-	-	1	-	4
5	Research Associate	-	-	-	-	-	4	-	4
6	Wildlife Subject Expert	-	-	-	-	-	2	-	2
7	GIS Assistant	-	-	-	-	-	1	-	1
8	Junior Research Fellow	-	-	-	-	-	3	-	3
9	Functional Area Associate	-	-	1	-	-	-	-	1
10	Information Officer	-	-	-	-	1	-	-	1
11	IT Officer	-	-	-	-	1	-	-	1
12	Lab Chemist	-	1	-	-	-	-	-	1
13	Programme Coordinator	-	-	-	2	-	-	-	2
14	Trainers Trainer	-	-	-	1	-	-	-	1
15	Accounts Assistant	-	-	-	-	-	-	1	1
16	Technical Assistant	-	-	-	-	-	2	-	2
17	Project Assistant/Field Assistant	1	-	-	-	-	5	-	6
	Total	6	1	2	3	2	18	1	33

3.5 AUDITORS: FOLLOWING ARE THE AUDITORS FOR THE EMPRI

Statutory Auditor	Internal Auditor
M/s. N N R & Co. Chartered Accountants No. 163, II Floor, Rajeshwari Complex Above Karnataka Bank Ltd., R.V. Road Bengaluru – 560 004.	M/s. Mahesh Chartered Accountants No – 479, Shell Petrol Bunk, Tumkur Road, Bangalore

ANNEXURE

Annexure - 1: Governing Body Committee Members

Sl No	Members	Designation
1	Additional Chief Secretary Forest, Ecology & Environment Dept. Government of Karnataka, Room No. 448, 4 th Floor, M.S. Building Bangalore	Chairperson
2	Principal Secretary Department of Ecology & Environment Government of Karnataka, Room No. 709, 7 th Floor, 4 th Gate, M.S. Building, Bangalore	Co-Chairman
3	Chairman, Karnataka State Pollution Control Board, Parisara Bhavan 5 th Floor, Church Street, Bangalore	Member
4	Additional Chief Secretary Urban Development Dept. Government of Karnataka, Room No. 436, 4 th Floor Vikasa Soudha, Bangalore	Member
5	Commissioner for Industrial Development & Director of Industries & Commerce, Government of Karnataka, No. 49, 2 nd Floor, Khanija Bhavana, Bangalore	Member
6	Commissioner for Health & Family Welfare Services, Government of Karnataka, Arogya Soudha Magadi Road Bangalore	Member
7	Secretary, Finance (Budget & Resource), Government of Karnataka, Room No. 250, 2 nd Floor Vidhana Soudha, Bangalore	Member
8	Member Secretary Karnataka State Pollution Control Board, No. 49, 5 th Floor Parisara Bhavan,, Bangalore.	Member
9	Regional Director South Zone Office, Central Pollution Control Board, Nisarga Bhavan, 7th D Cross, Shivanagar, Bangalore.	Member
10	Director General Environmental Management & Policy Research Institute Hasiru Bhavana, Doresanipalya Forest Campus, JP Nagar 5 th Phase, Bangalore.	Member Secretary

Annexure - 2: Executive Committee Members

Sl. No	Members	Designation
1.	Director General, Environmental Management and Policy Research Institute, Bangalore	Chairperson
2	Additional Principal Chief Conservator of Forests, Research and Utilization, Karnataka Forests Department, Bangalore	Member
3	Director(Tech.), Department of Environment & Ecology M. S. Building, Bangalore	Member
4	Internal Financial Advisor & Joint Secretary, Forest, Ecology and Environment, Government of Karnataka M.S. Building Bangalore.	Member
5	Director, Environmental Management and Policy Research Institute, Bangalore	Member Secretary

Annexure - 3: Research & Training Advisory Committee Members

Sl. No	Member	Designation
1	Director General, Environmental Management & Policy Research Institute, Bangalore	Chairperson
2	Additional Principal Chief Conservator of Forests, Research and Utilization, Karnataka Forests Department, Bangalore	Member
3	Member Secretary, Karnataka State Pollution Control Board No. 49, 5 th Floor, Parisara Bhavan, Bangalore	Member
4	Former Director General of Environmental Management & Policy Research Institute, Bangalore	Member
5	Director (Tech.), Ecology and Environment Department, Government of Karnataka, M.S. Building, Bangalore	Member
6	Professor of Law, National Law School of India University Nagarbhavi, Bangalore	Member
7	Chairman, CISTUP, Indian Institute of Science, Bangalore	Member
8	Director, Institute for Social & Economic Change, Bangalore	Member
9	Regional Director Central Pollution Control Board (South), Bangalore	Member
10	Director Institute of Wood Science and Technology, Bangalore	Member
11	Fellow (Centre of Environmental Studies), Southern Regional Centre (TERI), Bangalore	Member
12	Director, Environmental Management and Policy Research Institute, Bangalore	Convener

Annexure-4: Technical Advisory Panel Members

Sl. No.	Members	Designation
1.	Director General, Environmental Management & Policy Research Institute, Bangalore	Chairman
2.	Sri. Shivakumar Talawar System Analyst DPAR e-Governance, Nodal Officer, Bangalore	Member
3.	Expert member -1 (Sri Vipin Singh IFS, Dir e-governance)	Member
4.	Expert member -2 (Sri Biswajit Mishra IFS, CCF, KFD)	Member
5.	Director (Research), Environmental Management & Policy Research Institute, Bangalore	Member
6.	System Administrator, Environmental Management & Policy Research Institute, Bangalore	Convenor

Annexure- 5: Trainings/Workshops Conducted During the Year 2021-22

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
1	27-04-2021	Phytoremediation	Lakshmikanth, EO, KSPCB, Karwar	Officers of ULB's	13	Online	01
2	29-05-2021	Solid Waste Management Initiatives of BBMP in Solid waste Management & Extended Producers responsibility	T. Mahesh EO, KSPCB, Bangalore	Officers and Staff of EMPRI	57	Online	01
	29-05-2021	SWM State Policy	Mrs. Sandhya Narayanan, SWMRT	Officers and Staff of EMPRI		Online	
3	31-05-2021	Climate change: Impacts, adaptation and mitigation	Ms. Deepika Swami, EMPRI Fellow, Climate Change, EMPRI	Officers and Staff of EMPRI	60	Online	01
	31-05-2021	Karnataka State Action Plan On Climate Change	Mrs. O.K Remadevi, Consultant, Climate Change Cell, EMPRI	Officers and Staff of EMPRI		Online	
4	01-06-2021	Ground water pollution, protection & conservation measures in Bengaluru city	Dr. Hema N, Research Scientist, Climate Change Cell, EMPRI	Officers and Staff of EMPRI	60	Online	01
	01-06-2021	Research Methodologies in Biological and Environmental sciences	Dr. Akshay Chakravarthy, Research Scientist, EMPRI	Officers and Staff of EMPRI		Online	
5	02-06-2021	Ecosystem Restoration and Public participation	Dr. Shobha Anand Reddy, Independent Consultant, Environment & Sustainability	Officers and Staff of EMPRI	65	Online	01
	02-06-2021	Research Methodologies in Biological and Environmental sciences	Dr. V Sridhar, Principal Scientist, IHR, Hesaraghatta	Officers and Staff of EMPRI		Online	
6	03-06-2021	Fundamentals of GIS and Applications on Environment	Dr. D.C. Lingadevaru, Scientific Officer, KRSAC Smt. Chaithra, Sr. Project Scientist, KRSAC Sri. Mohammed Saleem Shaik, Scientific Officer, KRSAC Dr. P.D. Jay Kumar, Scientific Officer, KRSAC	Officers and Staff of EMPRI	64	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
7	04-06-2021	Office Procedures: Preparation of Note Sheets & Vouchers	Sri. B.S. Hegde, Manager (Accounts), EMPRI	Officers and Staff of EMPRI	82	Online	01
	04-06-2021	Mammalian Study	Dr. H. Kumar, Consultant & Subject Expert, EMPRI	Officers and Staff of EMPRI		Online	
8	05-06-2021	Celebration Of World Environment Day	Sri. Ajai Mishra, IFS, PCCF (Wildlife) (R) Dr. K.H. Vinaya Kumar, IFS (R), Director, EMPRI Sri. T. Mahesh, Technical Director, EMPRI Dr. M.K. Ramesh	Officers and Staff of EMPRI	72	Online	01
9	11-06-2021	Ecosystem Restoration	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	147	Online	01
10	14-06-2021	Waterbody Restoration and Management	Dr. Shobha Anand Reddy, Independent Environmental Consultant	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	43	Online	01
11	15-06-2021	Conserve what our children deserves through sustainable development	Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	112	Online	01
12	16-06-2021	Don't make water sick	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	81	Online	01
13	17-06-2021	Renewable and non-renewable energy sources and environmental management	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	71	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
14	18-06-2021	Mangroves: to save Earth?	V.N. Nayak, Professor of Marine Biology (Retd)	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	28	Online	01
15	19-06-2021	Mental Health during Covid-19 Pandemic	Dr. Raveesh. B.N, Professor & Head Dept of Psychiatry Mysore Medical College	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	56	Online	01
16	21-06-2021	Does Ozone Hole Impact	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	35	Online	01
17	23-06-2021	Air Pollution and Health	Radheshyam Balaji, Addl Director (R), CPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	27	Online	01
18	24-06-2021	Indian Constitution and Environmental Protection	Dr. M.K. Ramesh, Professor NLSIU	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	19	Online	01
19	25-06-2021	Noise its effects on Animals and how it is measured	Radheshyam Balaji, Addl Director (R), CPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	15	Online	01
20	26-06-2021	Legal Empowerment of Environmentally Benign Traditions	Dr. M.K. Ramesh, Professor NLSIU	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	50	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
21	28-06-2021	Global commons and Local Actions	Nagesh Hegade, Renowned Environmentalist and Visiting Professor at IJNM (Indian Institute of Journalism and New Media), Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	245	Online	01
22	29-06-2021	Environmental Compensation – Tool for Pollution Control	Dr. D. R. Ravi, SEO, KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	425	Online	01
23	30-06-2021	Wetlands-Importance and Conservation	Dr. Shobha Anand Reddy	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	128	Online	01
24	01-07-2021	Rural Sanitation	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	41	Online	01
25	02-07-2021	Impact of Plastic & Re-engineering in sustainable infrastructure	Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	106	Online	01
26	03-07-2021	Stress and Resilience during Pandemic	Dr. Shivananda Manohar	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	13	Online	01
27	05-07-2021	Destruction of Biodiversity and its impact on Ecosystem	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	31	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
28	06-07-2021	Coastal & Marine Bio-diversity	V.N. Nayak, Professor of Marine Biology (Retd)	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	255	Online	01
29	07-07-2021	Hybrid Technology: Drinking Water	Dr. B. Nagappa, Former Sr. Scientific Officer, KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	27	Online	01
30	08-07-2021	Air Act 1981 & its Implementation by Pollution Control Board	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	325	Online	01
31	09-07-2021	Hazardous Waste Management – Rules and Regulations	Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	31	Online	01
32	12-07-2021	Science of Climate Change- Adaptation and Mitigation	Dr.Indu.K.Murthy Principal Research Scientist, CSTEP	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	90	Online	01
33	13-07-2021	Covid-19 Waste Management	Radheshyam Balaji, Addl Director (R), CPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	22	Online	01
34	14-07-2021	Disaster & Management Strategies	V.N. Nayak, Professor of Marine Biology (Retd)	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	43	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
35	15-07-2021	Nexus between Climate Change, Public Health & Covid-19: An Inconvenient Truth	Prof Krishna Raj, ISEC	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	39	Online	01
36	16-07-2021	Western Ghats – Today & Tomorrow	Nagesh Hegde, Renowned Environmentalist and Visiting Professor at IJNM (Indian Institute of Journalism and New Media), Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	27	Online	01
37	17-07-2021	Industrial Air Pollution & Its impact on Living Organisms	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	92	Online	01
38	19-07-2021	Water I drink is it safe what are future scenario	Radheshyam Balaji, Addl Director (R), CPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	43	Online	01
39	22-07-2021	Our role in creating a Cleaner, Greener and Kinder Earth	Mrs. Deepambika T J, Go green Enthusiast & Educator, Singapore	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	25	Online	01
40	23-07-2021	Role of industries in sustainable development	Prof. Nagesh Hegde, Renowned Environmentalist and Visiting Professor at IJNM (Indian Institute of Journalism and New Media), Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	87	Online	01
41	24-07-2021	Impact of Vehicular Pollution in Bengaluru	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	27	Online	01
42	24-07-2021	Home and Community Composting	Mr. Vasuki Iyengar, M/s Soil & Health, Bengaluru	Officers and Staff of EMPRI	28	Offline	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
43	26-07-2021	Solid waste Management in Covid times and afterwards	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	41	Online	01
44	29-07-2021	Pandemic Prevention: Simple steps	Dr S Pruthvish, Public Health Expert, President, Society for Community Health Action and Research (SOCHARA), Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	15	Online	01
45	30-07-2021	E-Waste – Responsibilities of different stakeholders to reduce the adverse impact	Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	125	Online	01
46	31-07-2021	Global Warming impact on World Environment	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	97	Online	01
47	02-08-2021 to 01-09-2021	WWTP Batch-4		Unemployed Youth , Employees of BWSSB	24	Offline	25 man days
48	03-08-2021	Role of STP in containing diseases	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	06	Online	01
49	07-08-2021	Depletion of ozone & its effects on globe	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	67	Online	01
50	09-08-2021	Accreditation to safe environment	Radheshyam Balaji, Addl Director [®] , CPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	64	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
51	11-08-2021	Modern collection equipment's and transportation vehicles for automated solid waste management	Dr. M Lokeshwari, Associate professor and NSS Officer, RV College of Engineering, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	49	Online	01
52	13-08-2021	Photochemical Pollutants and its impact on Human and Ecology	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	85	Online	01
53	17-08-2021	Biological diversity conservation and benefits	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	31	Online	01
54	21-08-2021	Reasons for Acid Rains and its adverse effects on Human Health and Environment	Sri D.R. Kumaraswamy, CEO(R), KSPCB	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	55	Online	01
55	23-08-2021	Methodologies for Ambient Air and Source Emissions Monitoring	Dr B . Nagappa Former Senior Scientific Officer, KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	93	Online	01
56	24-08-2021	Global warming issues, threats and mitigative measures	V.N. Nayak, Professor of Marine Biology (Retd)	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	40	Online	01
57	26-08-2021	Nuclear Power : New Possibilities and Old Challenges	Nagesh Hegade, Renowned Environmentalist and Visiting Professor at IJNM (Indian Institute of Journalism and New Media), Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	131	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
58	28-08-2021	Air Pollution Equipment's adopted in industries and its maintenance	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	152	Online	01
59	04-09-2021	Noise Rules and its impact on Human Health, Animals, Birds and Environment	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	342	Online	01
60	07-09-2021	Plastic pollution, where is the solution?	Dr. V.N. Nayak, Professor of Marine Biology (Retd)	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	560	Online	01
61	16-09-2021	Ozone a boon or bane	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	26	Online	01
62	18-09-2021	First Aid and Basic Life Support	Dr. Bhushan Shravan, Medical Officer, ABB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	235	Online	01
63	24-09-2021	Hazardous and other waste (Management and Transboundary Movement) Rules 2016	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	109	Online	01
64	28-09-2021	Awareness on Environmental Rules and Act	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	97	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
65	12-10-2021	Air pollution and its effect on vulnerable population	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	19	Online	01
66	22-10-2021	Coastal issues and management strategies	Dr. V.N. Nayak, Professor of Marine Biology (Retd)	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	77	Online	01
67	08-11-2021 to 08-12-2021	WWTP Batch-5		Unemployed Youth , Employees of BWSSB	30	Offline	25 Man days
68	29-11-2021	Environmental Laws	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	147	Online	01
69	04-12-2021	"Environmental Protection Act, 1986" [The Hazardous and other Waste (Management and Transboundary Movement) Rules 2016]	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Officers and Staff of various departments, Corporates, NGO's, Educational institutes and general public	121	Online	01
70	21-12-2021	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Bagalkot	132	Online	01
71	21-12-2021	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Bangalore North	69	Online	01
72	22-12-2021	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Bangalore South	137	Online	01
73	22-12-2021	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Bangalore Rural	70	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
74	23-12-2021	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Belagavi	136	Online	01
75	23-12-2021	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Bellary	69	Online	01
76	24-12-2021	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Bidar	84	Online	01
77	24-12-2021	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Bijapur	75	Online	01
78	27-12-2021	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Chamarajinagar	104	Online	01
79	27-12-2021	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Chikballapura	84	Online	01
80	28-12-2021	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Chikmangalore	80	Online	01
81	28-12-2021	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Chikkodi	93	Online	01
82	29-12-2021	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Tumkur	131	Online	01
83	29-12-2021	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Dakshina Kannada	93	Online	01
84	30-12-2021	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Davanagere	127	Online	01
85	30-12-2021	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Dharwad	65	Online	01
86	31-12-2021	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Gadag	75	Online	01
87	01-01-2022	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Kalburgi	90	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
88	01-01-2022	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Hassan	130	Online	01
89	03-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Haveri	131	Online	01
90	03-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Kodagu	129	Online	01
91	04-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Kolar	128	Online	01
92	04-01-2022	Awareness on Air pollution	Ramesh Kumar. B.N, Chief Environmental Officer(R), KSPCB, Chairman, Prakruthi Institute of Environmental Studies	Eco-club Teachers from Koppal	117	Online	01
93	05-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Madhugiri	96	Online	01
94	05-01-2022	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Mandya	128	Online	01
95	06-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Mysore	144	Online	01
96	06-01-2022	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Raichur	135	Online	01
97	07-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Ramanagara	162	Online	01
98	07-01-2022	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Shimoga	96	Online	01
99	10-01-2022	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Sirsi	60	Online	01
100	10-01-2022	Awareness on Air pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Chitradurga	103	Online	01
101	11-01-2022	Awareness on Air pollution	Radheshyam Balaji, Addl Director (R), CPCB, Bengaluru	Eco-club Teachers from Udupi	73	Online	01
102	11-01-2022	Awareness on Air pollution	Mr. LakshmiKanth, Environmental Officer, Karwar	Eco-club Teachers from Uttarakannada	121	Online	01
103	12-01-2022	Awareness on Air pollution	Mr. D.R. Kumaraswamy, CEO(R), KSPCB, Bengaluru	Eco-club Teachers from Yadagiri	104	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
104	12-01-2022	Awareness on Water pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Hassan	336	Online	01
105	13-01-2022	Awareness on Water pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Mandya	282	Online	01
106	13-01-2022	Awareness on Water pollution	Dr. B. Nagappa, Former Senior Scientific Officer, KSPCB, Bengaluru	Eco-club Teachers from Bangalore North	154	Online	01
107	14-01-2022	Awareness on Water pollution	Dr. Channakeshava. S, Associate Professor, Dept. Of Soils Science & Agricultural Chemistry, University of Agricultural Science (UAS), Bengaluru	Eco-club Teachers from Bangalore South	325	Online	01
108	25-01-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Suman G - Dr. Lalitha K - Smt. Anjana Kumari	Medical staff – Bangalore Rural	247	Online	01
109	27-01-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Suman G - Dr. Lalitha K	Medical staff - Belgaum	227	Online	01
110	29-01-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Akshaya K.M - Mr. Manoj Kumar -D.R. Kumaraswamy	Medical staff - Bellary	244	Online	01
111	01-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Akshaya K.M - Dr. Narasimha B.C - Mr. Manoj Kumar -D.R. Kumaraswamy	Medical staff - Bidar	285	Online	01
112	02-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Akshaya K.M - Dr. Narasimha B.C	Medical staff - Bijapur	125	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
113	03-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Suman G - Dr. Akshaya K.M - Dr. Narasimha B.C - Mr. Manoj Kumar	Medical staff - Chamarajanagar	94	Online	01
114	04-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Suman G (2 sessions) - Mr. Manoj Kumar	Medical staff - Chickballapura	186	Online	01
115	05-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj B.M(2 sessions) - D.R. Kumaraswamy (2 sessions)	Medical staff - Chikmagalur	465	Online	01
116	08-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj B.M(2 Sessions) - Dr. Manjunath S Nekar - D.R. Kumaraswamy	Medical staff - Chitradurga	91	Online	01
117	09-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Akshaya K.M - Dr. Manjunath S Nekar	Medical staff – Dakshina Kannada	357	Online	01
118	11-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj. B.M(2 Sessions) - Mr. D.R. Kumaraswamy(2 Sessions)	Medical staff – Davanagere	505	Online	01
119	15-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj. B.M(2 Sessions) - Dr. Manjunath S Nekar - Mr. Manoj Kumar - Mr. D.R. Kumaraswamy	Medical staff – Dharwad	176	Online	01
120	16-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Hemagiri. K - Dr. Akshaya K.M - Mr. Manoj Kumar	Medical staff – Gadag	323	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
121	17-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Akshaya K.M - Dr. Narasimha. B.C - Mr. Manoj Kumar	Medical staff – Kalburgi	142	Online	01
122	18-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Narasimha. B.C - Dr. Akshaya K.M - Dr. Manjunath S Nekar - Mr. Manoj Kumar	Medical staff – Hassan	167	Online	01
123	19-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj. B.M(2 Sessions) - Dr. Hemagiri. K - Mr. D.R. Kumaraswamy	Medical staff – Haveri	215	Online	01
124	22-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj. B.M - Dr. Narasimha. B.C - Dr. Manjunath S Nekar - Mr. Manoj Kumar	Medical staff – Kodagu	225	Online	01
125	23-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Suman G - Dr. Akshaya K.M - Mr. Manoj Kumar	Medical staff – Kolar	231	Online	01
126	24-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Suman G - Dr. Akshaya K.M - Mr. Manoj Kumar	Medical staff – Koppal	114	Online	01
127	25-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Akshaya K.M - Dr. Manjunath S Nekar - Mr. Manoj Kumar	Medical staff – Mandya	275	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
128	28-02-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj B.M - Dr. Suman G - Dr. Lalitha K - Mr. Manoj Kumar	Medical staff – Mysore	111	Online	01
129	02-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Ramakrishna Goud - Dr. Suman G - Dr. Manjunath S Newar - Mr. Manoj Kumar	Medical staff – Raichur	234	Online	01
130	03-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Ramakrishna Goud - Dr. Lalitha. K - Dr. Hemagiri. k - Mr. Manoj Kumar	Medical staff – Ramanagara	215	Online	01
131	04-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj B.M(2 sessions) - Dr. Narasimha B.C - Mr. D.R. Kumaraswamy - Mr. Manoj Kumar	Medical staff – Shimoga	147	Online	01
132	05-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Suman G - Dr. Hemagiri K -Dr. Akshaya K.M - Mr. Manoj Kumar	Medical staff – Tumkur	370	Online	01
133	08-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Suman G - Dr. Hemagiri K -Dr. Lalitha K	Medical staff – Udupi	358	Online	01
134	09-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. B. Ramakrishna Goud - Dr. Hemagiri K -Dr. Shivaraj B.M - Mr. Manoj Kumar	Medical staff –Uttara Kannada	100	Online	01

Sl. No	Date	Details of training	Details of resource person	Target Participants	No. of participants	Venue	Number of man-days
135	10-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Lalitha K - Dr. Hemagiri. K -Dr. Narasimha B.C - Mr. Manoj Kumar	Medical staff –Vijayanagara	87	Online	01
136	11-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Lalitha K - Dr. Suman G -Dr. Akshaya K.M - Mr. Manoj Kumar	Medical staff –Yadagiri	202	Online	01
137	15-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Ramakrishna Goud -Dr. Hemagiri. K - Dr. Manjunath S Nekar - Mr. Manoj Kumar	Medical staff –Bagalkot	237	Online	01
138	17-03-2022	Bio-Medical Waste Management	- Dr. S. Pruthvish - Dr. Shivaraj B.M -Dr. Suman G - Dr. Hemagiri. K - Mr. Manoj Kumar	Medical staff –Bangalore Urban	697	Online	01
139	21-03-2022	Orientation Training Program- In house	Section Heads of EMPRI	Newly joined EMPRI staff	42	Offline	01



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