

MINUTES OF THE SECOND MEETING OF THE STEERING COMMITTEE ON ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAMME (ERDP) HELD ON 21st NOVEMBER, 2024 AT MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, INDIRA PARYAVARAN BHAWAN, NEW DELHI.

The second meeting of the Steering Committee on ERDP was held on 2nd November, 2024 under the Chairmanship of Dr. Amandeep Garg, Additional Secretary, to consider six (06) research project proposals which were already recommended by the Technical-cum-Financial Appraisal Committee (TFAC). The list of participants is at **Annexure-I**.

2. Ms. Rita Khanna, Adviser (RE), welcomed Dr. Amandeep Garg, Additional Secretary (EF&CC), Chairman and the other members of the Steering Committee. It was informed that the project proposals are received online on the MIS-Portal under the ERDP. A total of six (06) research proposals recommended by TFAC were considered during the meeting.

Agenda Item No.1. Introductory remarks by the Chairman, Steering Committee.

Dr. Amandeep Garg, Additional Secretary (EF&CC) and Chairman of the Steering Committee welcomed all the participants in the meeting.

Agenda Item No.2: Confirmation of the Minutes of the Meeting of 1st Steering Committee held on 21.06.2024.

The Committee was informed that the MoM of the 1st Steering Committee were circulated to all concerned. No comments have been received. The Steering Committee agreed to confirm the minutes of its 1st meeting.

Agenda Item No. 3: Project proposals to be considered:

Agenda Item No. 3.1: Project proposals having 02 years duration recommended by the TFAC:

3.1.1 Project No: 539/2023/RE

Title of the project: Automated Sustainable Lifecycle Assessment system to promote the developed cement-less eco-friendly precast panels.

PI/Institution: Dr. R Mohana, Professor, Civil Department, Mepco Schlenk Engineering College, Sivakasi.

Co PI: Dr. K. Jeyasubramanian, Senior Professor & Head, Chemistry Department, Mepco Schlenk Engineering College, Sivakasi

Duration: 02 Years

Thematic Area: Pollution Prevention – Clean Technologies and Processes,

Cleaner Production, 3Rs, Resource Efficiency, Waste Minimisation and Management, etc.

Background: Earlier this project was considered in the 5th meeting of the TFAC held on 05-06 Sept, 2024. The committee observed that the proposed study is good and well written. Objectives are clear and the methodologies are appropriate. After detailed deliberations, the Committee recommended the proposal for funding from the Ministry.

Objectives of the project:

- To promote the developed Cementless Ferrocement Precast panels (Completed MoEF project – 271/2018/RE) to the real time societal applications by considering the environmental constraints and benefits.
- To validate the environmental impacts quantitatively through GaBi-LCA software analysis
- To generate an Automated LCA decision making system using machine learning methods.
- To facilitate the Ministry to classify and promote the environmental friendly products to execute the goal of “prevention and control of pollution” through the proposed automated LCA decision making system.
- To aware the civilians, local contractors, Indian Infrastructure Industries and Environmental Scientists regarding the promotion of the developed sustainable product funded through MOEF and the proposed automated LCA decision making system from the research to real time practice.

Expected Outcomes of the project:

- Automated LCA Decision Making System adoption will promote India to become wealthier nation in the aspects of economic, environment-friendly and social development.
- Developed LCA methodology will be implemented in all sectors such as manufacturing, construction, medical, etc. throughout India.
- Global threatening challenges like climate change, pollution and human toxicity will be reduced as minimum as possible through this project implementation.

The component wise breakup of the cost of the project as per the recommendation of TFAC: ₹24,19,310/-.

Component	Year 1	Year 2	Total Cost
Salary	554400	554400	1108800
Equipment	535000	0	535000
Travel	60000	60000	120000
Contingency (5%)	100000	100000	200000
Institutional Charges (15%)	197910	117600	315510
Any Other*	70000	70000	140000
Total Cost	1517310	902000	2419310

The details of manpower and equipment required specifically for the project:
Research Fellows (JRF/SRF): 01

Details of equipment required under the project:

- i.) Desktop supporting high GUI for ALCADMS system and ii) GaBi LCA software.

Recommendation: The proposal was presented by the PI before the Steering Committee. The committee observed that the proposal was incoherent and concept seems to be very basic. After detailed deliberations, the Committee **did not recommend** the proposal for funding.

3.1.2: Project No: 678/2024/RE

Title of the project:- Technology Development for Conversion of Tender Coconut Waste to Bio-coal as an Energy Rich and Smokeless Cooking Fuel for Rural Applications in Puri District of Odisha.

PI/ Institution: Prof. Manoj Kumar Ghosal, Scientist, Socio Cultural Development Centre, Hajipur, Odisha

Co-PI: Prof. A. N. Dash, Scientist, Socio Cultural Development Centre, Hajipur, Odisha.

Duration: 02 Years

Thematic Area: Pollution Prevention – Clean Technologies and Processes, Cleaner Production, 3Rs, Resource Efficiency, Waste Minimisation and Management, etc

Background: The said project was considered in the 5th Meeting of the TFAC held on 05-06 September, 2024. The Committee observed that the proposed study is related to technology development for conservation of tender coconut waste to bio-coal as an energy rich and smoke less cooking fuel. After detailed deliberations, the Committee recommended the proposal for funding for a period of two-year duration as per the guidelines.

Objectives of the project:

1. To study the charring conditions (burning time and charring time) of fixed amount of processed green/tender coconut for effective carbon recovery of carbonized product
2. To study the strength and durability of Bio-coal using easily available binding materials like rice gruel, vegetable waste, cow dung and waste paper.
3. To study the calorific value, heat transfer efficiency in water boiling test and emissions (CO, CO₂ and smoke level) from the Bio-coal in traditional and improved cook stoves
4. Demonstrations of the Bio-coal preparation to the end users.

Expected Outcomes of the project:

The bio-coal prepared from waste green coconut shell and from other agro-residues through the technology, developed in the proposed project would become beneficial to the following target groups and shall have a far reaching impact in the adjoining areas due to mainly the following reasons:

- i. Protecting the health of rural women mostly involved in domestic cooking by using an energy rich and smoke less fuel prepared from waste green coconut shells.
- ii. Environment and solving the disposal problems of under-utilized and neglected agro residues.
- iii. Mitigating deforestation by reduction in the use of fire wood for preparing charcoal as now required by semi-urban people for cooking purposes, laundries, blacksmiths, hotels and restaurants etc.
- iv. Promoting and encouraging the “Swachha Bharat Abhiyan” of our country.

The component wise breakup of the cost of the project as per the recommendation of TFAC is given below: ₹58,76,450/-

Component	Year 1	Year 2	Total Cost
Salary	1260000	1260000	2520000
Equipment	1090000	0	1090000
Consumables	200000	200000	400000
Travel	200000	200000	400000
Contingency	230500	83000	313500
Institutional Charges	691500	261450	952950
Any Other*	100000	100000	200000
Total Cost	3772000	2104450	5876450

The details of manpower and equipment required specifically for the project:

Research Fellows (SRF): 02

Technical Assistant: 01

Details of equipment required under the project:

- (i) Charring drum @₹9000/drum of 30-40 kg input capacity per year (5 nos.)
- (ii) Exhaust Gas Analyzer (CO, CO₂, CH₄, HC)
- (iii) Bomb Calorimeter
- (iv) Solar dryer (PV attached) 3 Nos. @ ₹50,000/unit
- (v) Greenhouse dryer (UV stabilized polythene) 5 Nos. @ ₹4,000/ unit
- (vi) Solar PV attached forced draft cook stove 5 Nos. @₹5,000/ unit.

Recommendation:

- The proposal was presented by the PI before the Steering Committee. The Committee observed that the proposed study is related to technology

development for conservation of tender coconut water to bio-coal as an energy rich and smoke less cooking fuel.

- With a considered view, the Committee recommended the proposal for funding for a period of two-year duration subject to the reduction of the budget and rationalization of the same as per Government norms. Accordingly, the PI has been requested to revise the budget and submit the same online. The proposal need not be placed before Steering Committee and TFAC again.

3.1.3 Project No: 712/2024-RE

Title of the project: Evaluation ecosystem functioning using Herpetofauna as a model system in Goa and adjoining areas.

PI/ Institutions: Dr. Nitin S. Sawant, Asstt. Prof., Deptt of Zoology, Goa University, Goa.

Duration: 02 Years

Thematic Area: Ecosystems Conservation & Management (Mountain, Forest, Coastal, Wetlands, Pastoral, etc.) and Evaluation of Ecosystem Services

Background: Earlier the said project was considered in the 4th Meeting of the TFAC held on 18-19 June, 2024. After detailed deliberations, the Committee suggested that PI should focus only on one defined ecosystem i.e. Plateau, Coastal Wetland only and the budget may be revised accordingly and directed for submission for revised proposal to the Ministry for further consideration.

Again, it was considered in the 5th Meeting of the TFAC, The TFAC was appraised by the Member Secretary that the recommendations of the Committee were communicated to the PI and the proposal has been revised accordingly. The revised proposal along-with revised budget was discussed in detail. After detailed deliberations, the revised proposal had been recommended for funding for a period of two-year duration by the Committee.

Objectives of the project:

- i. Classification of Habitat and identification of Functional groups of Herpetofauna in different Ecosystems.
- ii. To Identify the Ecosystem services of Herpetofauna using Phylogenetic and Functional Diversity.
- iii. To suggest/formulate Conservation and management plan for efficient management of Ecosystems.

Expected Outcomes of the project:

- i. To assist in regional conservation planning by assessing the status and distribution of all species occurring within the region.
- ii. To develop a network of regional experts to support future assessments and the updating of the information on these species.
- iii. The assessment provides two direct outputs: A report on the status of the reptilian diversity of the plateau ecosystem and those in peninsular India, including a Red List assessment of all the species; identification of the main threats for each species; and a spatial representation of the centres of species richness and threats; a database that provides a baseline for monitoring the status of reptiles belonging to the region of assessment.

The component wise breakup of the cost of the project as per the recommendation of TFAC is given below: ₹50,99,184/-.

Component	Year 1	Year 2	Total Cost
Salary	10,30,080	10,30,080	20,60,160
Equipment	6,00,000	-	6,00,000
Genome Sequencing	3,00,000	2,00,000	5,00,000
Consumables	2,00,000	1,00,000	3,00,000
Travel	3,00,000	2,00,000	5,00,000
Contingency	1,00,000	1,00,000	2,00,000
Overhead Charges	3,64,512	2,74,512	6,39,024
Dissemination of Work	-	3,00,000	3,00,000
Total Cost	28,94,592	22,04,592	50,99,184

The details of manpower and equipment required specifically for the project:
Research Fellows (JRF): 02

Details of equipment required under the project:

- i. Automated DNA extractor, ii Sound recorder and iii) DSLR camera.

Recommendation: The proposal was presented by the PI before the Steering Committee. After detailed deliberations, the Committee recommended the proposal for funding for a period of two-year duration subject to the reduction of the budget and rationalization of the same as per Government norms.

Accordingly, the PI has been requested to i) carry out ethical Committee clearance; ii) use of high resolution data; and iii) downward revision of the budget. The PI may submit the same online. The proposal need not be placed before Steering Committee and TFAC again.

Agenda Item No. 3.2: Project proposals having 03 years duration recommended by the TFAC:

3.2.1 Project No: 724/2024/RE

Title of the project: Cataloging of potential microbial communities and development of nano-sensor for ecosystem across Himalayan Sulfur springs Sahastradhara, Uttarakhand.

PI/ Institutions: Prof. Nabeel Ahmad, Professor, School of Allied Science, Dev Bhoomi Uttarakhand University, Dehradun

Co-PI: Dr. Nirjara Singhvi, Assistant Professor, School of Allied Sciences, Dev Bhoomi Uttarakhand University, Dehradun

Duration: 03 Years

Thematic Area: Ecosystems Conservation & Management (Mountain, Forest, Coastal, Wetlands, Pastoral, etc) and Evaluation of Ecosystem Services

Background: The said project was considered in the 4th Meeting of the TFAC held on 18-19th June, 2024. The Committee observed that the proposal is important and well written. Objectives are clear and the methodology is appropriate. After detailed deliberations, the Committee recommended the proposal for funding for a period of three years with the followings budgetary provisions:

- JRF-1;
- Equipment - ₹13 lakh (high end server);
- Consumable- ₹6 lakh @₹2.0 lakh per year;
- Travel-₹1.0 lakh @₹0.4, 0.3 and 0.3 lakh per year;
- Contingency (5%) and Institutional Charges (15%) of the total cost (As per the existing norms/rules of the Ministry).

Objectives of the project:

- i. Exploring the microbial diversity across the stretches of Sahastradhara sulfur spring
- ii. Isolation and characterization of novel extremophile Sulfur oxidizing bacteria using culture-dependent approaches and culture-independent approaches
- iii. Mining of enzymatic potential using the metagenomic data of Sulfur springs to understand functional dynamics of the site.
- iv. Biosynthesis and characterization of Metal Nanoparticle using extremophilic bacteria using Green synthesis techniques and exploring its therapeutics potential in vitro.
- v. Nanomaterial-enabled nanosensors for water quality monitoring at Sahastradhara sulfur spring.

Expected Outcomes of the project:

- i. First cataloging report of the microbial diversity of the pristine site of sulfur spring in the Himalayan valley
- ii. Monitoring microbial populations can help assess the impact of environmental changes, such as pollution or climate change, on the springs.

This information is crucial for conservation efforts aimed at preserving these valuable ecosystems.

- iii. Understanding the microbial diversity of cold sulfur springs can lead to the identification of specific microorganisms with biotechnological potential. These microbes can be harnessed to develop sustainable strategies for cleaning up polluted environments, such as contaminated water bodies or industrial sites.
- iv. Development of nanoparticles using extremophiles to exploit the biomedical properties and formulation of nanosensors to monitor the pollution in water bodies.

The component wise breakup of the cost of the project as per the recommendation of TFAC is given below: ₹51,31,000/-

Component	Year 1	Year 2	Year 3	Total Cost
Salary	732000	732000	732000	2196000
Equipment	1310000	0	0	1310000
Consumables	400000	300000	300000	1000000
Travel	40000	30000	30000	100000
Contingency	100000	100000	100000	300000
Institutional Charges	225000	0	0	225000
Total Cost	2807000	1162000	1162000	5131000

The details of manpower and equipment required specifically for the project is given below:

Research Fellows (SRF): 01

Lab Assistant: 01

Details of equipment required under the project:

- i). Server for Bioinformatic analysis: 512 gb RAM, Intel Xeon Gold/platinum Processor, 96 Cores, 64TB SATA HD, 512GB * 6 SSD, and
- ii) Potentiostat with cell and electrodes.

Recommendation:

The proposal was presented by the PI before the Steering Committee. The PI has been advised to revise the proposal to two (02) year duration with reduction in the budget and all other aspects proportionately. The revised proposal may be submitted on the portal and it will be considered in the next Steering Committee meeting.

3.2.2 Project No.: 814/2024/RE

Title of the project: Establishment of Mangrove Gene bank for Germplasm Conservation in South east coast of India for climate change mitigation.

PI/Institutions: Dr. T Ramanathan, Professor, Centre of Advanced Study in Marine Biology, Faculty of Marine Sciences, Annamalai University, Porto Novo, Tamil

Nadu - 608502

Co PI:

1. Dr.Kannan Sivakumar, Associate Professor, Centre of Advanced Study in Marine Biology, Faculty of Marine Sciences, Annamalai University, Porto Novo, Tamil Nadu- 608502
2. Dr.M.Thirunavoukkarasu, Chief Scientist and Head, CSIR Madras complex, Taramani, Chennai 600 113

Duration: 03 Years

Thematic Area: Ecosystems Conservation & Management (Mountain, Forest, Coastal, Wetlands, Pastoral, etc.) and Evaluation of Ecosystem Services

Background: The said project was considered in the 4th Meeting of the TFAC held on 18-19 June, 2024. The Committee observed that the proposal is good and well written. Objectives are clear and the methodology is appropriate. After detailed deliberations, the Committee recommended the proposal for funding for a period of three years with the followings budgetary provisions:

- JRF-2, Field Assistant-1;
- Equipment - ₹13 lakh (Gene analyser, Electrophoresis unit and Thermal Cycler);
- Consumable- ₹8 lakh @₹3.0, 3.0 and 2.0 lakh per year;
- Travel-₹6.0 lakh @₹2.0 lakh per year;
- Contingency (5%) and Institutional Charges (15%) of the total cost (As per the existing norms/rules of the Ministry).

Objectives of the project:

- i. To document the site-specific occurrence of the mangrove species along South East Coast of India for understanding the conservation status of species through on Field survey and inventorisation.
- ii. Discussion with local people and forest officials and collection of Seeds/Propagules from the mangroves in different regions.
- iii. To standardize the techniques of macro and micro propagation.
- iv. To generate Molecular data, analysis and deposition into database.
- v. To establish and maintain the mangrove gene bank for species recovery.
- vi. To transplant the propagated mangrove species from Nursery to field
- vii. To impart the knowledge about mangroves to the coastal communities, school children's, college students and forest officials for conservation and protection of mangroves for climate change mitigation.

Expected Outcomes of the project:

- i. Establishment of ex situ conservation facilities, such as nurseries, tissue culture labs, or seed banks, equipped with appropriate infrastructure and resources for the propagation, maintenance, and storage of mangrove genetic material.
- ii. Standardization of protocols and procedures for the long-term storage of

seeds, tissue samples, or living collections, ensuring viability and genetic.

The component wise breakup of the cost of the project as per the recommendation of TFAC is given below: ₹65,94,200/-

Component	Year 1	Year 2	Year 3	Total Cost
Salary	924000	924000	924000	2772000
Equipment	940000	0	0	940000
Consumables	350000	350000	200000	900000
Travel	250000	200000	200000	650000
Contingency	300000	250000	250000	800000
Institutional Charges	182400	172400	177400	532200
Total Cost	2946400	1896400	1751400	6594200

The details of manpower and equipment required specifically for the project:
Research Associate: 01, and **JPF:** 01
Daily wages/ Labour Charges: 01

Details of equipment required under the project:

i. Gene analyser, ii) Electrophoresis unit and, iii) Thermal cyclers.

Recommendation: The proposal was presented by the PI before the Steering Committee. The PI has been advised to revise the proposal to two (02) year duration with reduction in the budget and all other aspects proportionately. The revised proposal may be submitted on the portal and it will be considered in the next Steering Committee meeting.

3.2.3 Project No.: 558/2023/RE

Title of the project: Full solar spectrum stimulated smart nanomaterials for direct reduction of CO₂ to valuable light weight gas phase hydrocarbon.

PI/Institutions: Dr. Saravanan Pichiah, Associate Professor, Deptt of Environmental Sciences and Engineering., Indian Institute of Technology (ISM), Dhanbad.

Duration: 03 Years

Thematic Area: Climate Change: Vulnerability & Risk Assessment, Process, Mitigation and Adaptation

Background: The said project was considered in the 2nd meeting of the TFAC held on 04-05th January, 2024. The TFAC suggested that the proposal may be **recommended** for funding from the Ministry subject to the procurement of proposed Gas Chromatography as per norms of the Government of India.

Objectives of the project:

- i. To identify and fabricate heterojunction enabled photocatalyst materials capable of utilizing function under LED lamp and full solar spectrum
- ii. To investigate the material s robustness and its inherent nature of fabricated nanomaterials.
- iii. To reveal its applicability demonstrated through laboratory studies and the effectiveness of the synthesized nanomaterials for CO2 reduction under solar energy
- iv. To optimize the reaction for the maximized production of C2+hydrocarbon

Expected Outcomes of the project: The project readily yields publication in flag-ships journals and Patents.

The component wise breakup of the cost of the project as per the recommendation of TFAC is given below: ₹48,23,250/-

Component	Year 1	Year 2	Year 3	Total Cost
Equipment	2500000	0	0	2500000
Consumables	500000	300000	250000	1050000
Travel	0	50000	50000	100000
Contingency	50000	250000	250000	550000
Institutional Charges	450750	90000	82500	623250
Total Cost	3500750	690000	632500	4823250

The details of manpower and equipment required for the project:

Manpower: Not required.

Details of equipment required under the project:

Gas chromatography (GC) mounted with FID and TCD detector.

Recommendation:

The PI has been advised to revise the proposal to two (02) year duration with reduction in the budget and all other aspects proportionality. The revised proposal may be submitted on the portal and it will be considered in the next Steering Committee meeting.

The meeting ended with a Vote of thanks to the Chair.

Annexure-I.

List of the participants:

A. SC Members

Sl.	Name	Remarks
1	Dr. Amandeep Garg, Additional Secretary, MoEF&CC	Chairman

2	Ms. Rita Khanna, Adviser (RE), MoEF&CC.	Vice Chairperson
3	Dr. K. Kathiresan, Emeritus Prof. CAS in Marine Biology, Annamalai University, Porto Novo (Online).	Member
4	Dr. Gurunath Ramanathan, Prof., Chemistry, IIT Kanpur (Online).	Member
5	Dr. B. Balaji, NBA Chennai (Online).	Member
6	Ms. Ridhika Aggarwal, Content Writer, Savitr Analytics & Media, B8G, Gangasthal Apartment, Part-1 Muni Ki Reti, Rishikesh (Online).	Member
7	Sh. Suresh Kumar, Director(IFD), representative of AS&FA, MoEF&CC	Member
8	Dr. Garima Sharma, DHR&D, representative of CPCB, Delhi. (Online).	Member
9	Dr S.S. Dass, Scientist, BSI	Special Invitee
10	Shri Aravind Kumar Agrawal, Director (RE), MoEF&CC.	Special Invitee
11	Dr. Rajendra Kumar, Scientist 'C', MoEF&CC.	Member-Secretary

B. Project Investigators

SI	Name/Address
1	Dr. R Mohana, Professor, Mepco Schlenk Engineering College, Sivakasi.
2	Prof. Manoj Kumar Ghosal, Scientist, Socio Cultural Development, Odisha
3	Dr. Nitin Savant, Asstt. Prof., Deptt. of Zoology, Goa University, Goa
4	Prof. Nabeel Ahmad, Prof., Deptt of Biotechnology, Dev Bhoomi Uttarakhand University, Dehradun.
5	Dr. T Ramanathan, Prof., CASMB, Annamalai University, Porto Novo
6	Dr. Saravanan Pichiah, Indian Institute of Technology (ISM), Dhanbad.
