



Indian Institute of Technology Kharagpur (IIT Kharagpur)

About IIT KGP and the CSR opportunities

The objectives of Indian Institute of Technology Kharagpur (IIT Kharagpur), located in the District of West Midnapore in the State of West Bengal, India, include:

- To provide broad based education where students are urged to develop their professional skills.
- To draw the best expertise in science, technology, management and law to impart overall training to students.
- To incubate a spirit of entrepreneurship and innovation in students.
- To undertake world class research in areas of national and global importance.
- To provide technical services and support to industry, government and society in relevant areas.

IIT Kharagpur, the largest and oldest IIT, is a confluence of world class multidisciplinary courses, giving global exposure in academics and research, scope in entrepreneurship and best placement. The institute has 19 Departments, 12 Schools and 8 Centres of Excellence. Additionally there are more than 25 R&D units. Academic programs are offered are B.Tech.(15), B.Arch, Dual Degree(35), MBA, MHRM, LLB, MMST, M.Sc/ M.Tech/ MCP/ MS (68), PhD in 6 broad disciplines: (1) Engineering, (2) Basic Sciences, (3) Life Sciences, (4) Social Sciences & Humanities, (5) Law and (6) Entrepreneurship.

IIT Kharagpur promotes co-curricular and multidisciplinary programs through innovative research projects. This inculcates among the students research competence and industry-worthiness through sponsored research

- Student Driven Programmes - SAE Formula Car, Boeing Aircraft Design, Robosoccer, Humanoid, Swarm Robotics, Quadrotor Aerial Vehicle, Autonomous Ground Vehicle, Autonomous Underwater Vehicle
- Students' E-Cell: Workshops, Competitions
- Technology Transfer Group: IndAC, Tech Transfer, TEDx

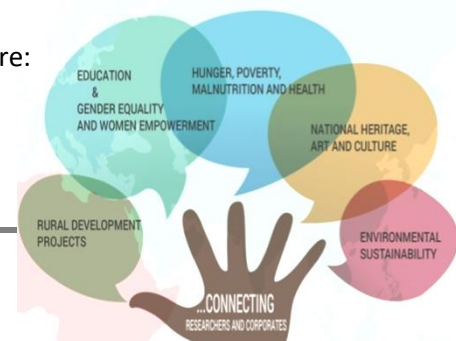
Students and faculty are actively involved in social activities through National Service Scheme (NSS)

- More than 1000 under-graduate students and 16 faculty members and officers donate ~5 lakh man-hour every semester in developmental initiatives in 25 villages and low-income urban neighborhoods around IIT Kharagpur



The broad areas in which majority of our CSR Projects aligned are:

1. Hunger, Poverty, Malnutrition and Health
2. Education
3. Rural Development Projects



4. Gender Equality and Women Empowerment
5. Environmental Sustainability
6. National Heritage, Art and Culture

Our major activities in societal development projects are through our mega projects, centers and deployable individual projects.

Mega Projects:

- Scientific Approach to Networking and Designing of Heritage Interfaces (<http://www.iitkgpsandhi.org>)
- Signals and Systems for Life Science (<http://signalsystemsforlifescience.in>)
- Sustainable Food Security through Technological Interventions for Production, Processing and Logistics (<http://sustainablefoodsecurity.in>)
- Future of Cities : Enhancing Urban Life in India (<http://www.facweb.iitkgp.ernet.in/~foc/>)

Centers in IIT Kharagpur for Socially Relevant Initiatives:

- Rural Development Centre
(Head Prof. Virendra Kumar Tewari)

The centre has a strong foot in the rural Indian perspective covering district-based regional development schemes in many areas like Intensive Crop Farming, Forestry, Horticulture, NTFP-based crafts, Women and Child Welfare programmes etc.

- Design and Innovation Centre for Rural Technology
(Principal Investigator, Prof. P.B.S. Bhadoria)

The objective is to upgrade and transfer rural technology through NGOs. The group has 40 NGOS covering Eastern India

Sponsor: PSA, Gol

- School of Medical Science and Technology
(Head: Prof. Suman Chakraborty)

It is a platform for interdisciplinary teaching and research in the field of Medical Science & Technology, which can lead to a better integrated healthcare delivery system.

For more information, visit: <http://www.smstweb.iitkgp.ernet.in/>

- Unnat Bharat Cell

Unnat Bharat Cell has been set up as a part of Govt. of India's Unnat Bharat Abhiyan, with a view to bring about transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of an Inclusive India. The Cell is a consortium of

- National Service Scheme (NSS) unit,
- Rural Technology Action Group (RuTAG),
- Rural Development Centre (RDC),
- School of Medical Science and Technology (SMST),
- Advanced Technology Development Centre (ATDC), and
- Department of Agriculture and Food Engineering (AGFE) members.

- Ongoing activities under National Service Scheme (NSS)
(Program Coordinator: Prof. Debasis Roy)

- Income generation
- Vocational training (funded by Society for Self Employment of Unemployed Youth, Kolkata)
- Twelve 144-hour courses on tailoring, mobile phone repair, plumbing, electrical wiring, electrical appliances repair and maintenance, 2- 3- wheeler repair and maintenance
- 30-35 trainees per course
- Development work at public facilities by the trainees
- Nutritional intervention at schools
- Pilot at Malma: 95 kids, 5-12 y; eggs and fruits provided as midday meal supplement over 3 months; malnutrition reduced from ~80 % to ~50 %
- Follow-up: solya cultivation at three primary schools for sustained improvement of children’s nutrition
- Infrastructure
- Road building at Balarampur (2.5 km), Malma (1 km) and Bolla (1 km)

- Agriculture and Food Engineering (AGFE)
(Head of the Department: Prof. Virendra Kumar Tewari)

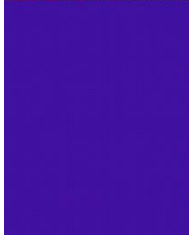
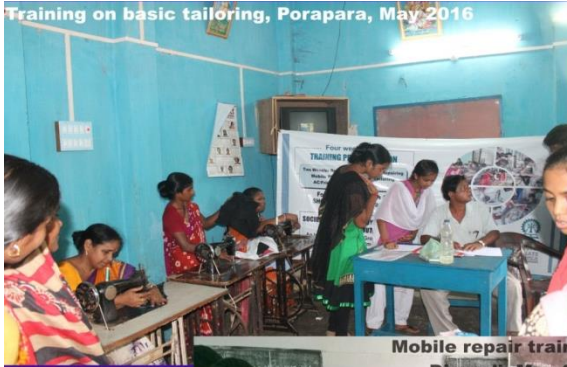
The department is unique among the IITs and carries extensive research and training activities in various areas of socio-economical relevance.

One of the projects that have been widely appreciated is “Formulation and Pilot Scale Unit for Production of Therapeutic Food in Ready-to-Eat Form (TF-RTE) for Management of SAM Children”
By Professor H N Mishra, Department of Biotechnology

For more information, visit : <http://www.agri.iitkgp.ernet.in/>



GLIMPSES OF ACTIVITIES UNDER THESE PROJECTS



Various Skill Development Programmes



Puffed rice making



Puffed rice making



Treatment of pond with clay



Biodiesel production from non-edible oils



Improved device for wet soil preparation



Mechanized production of Indian milk sweets

IIT Kharagpur has recently ventured into aligning with corporates for CSR funding. Some of the corporate CSR initiatives are :

- Community Participation Model for Economic Development and Nutritional Health Management Through Organic-farming And Education (Sponsored By Eastern Coalfields Limited, CIL Executed by: Prof. Khanindra Pathak, Prof. Analava Mitra et al)
- Medical Imaging Informatics for Skin Wound and Malaria Screening (Coordinating Organisation: Charities Aid Foundation, India. Donor Organisation: Microsoft India Development Center Executed by: Prof. Chandan Chakraborty)
- Tracking the antiquity and climate during Bronze age Harappan/Indus Valley Civilisation (IVC) in India using isotope and latest chronological techniques (Sponsored By: Infosys Foundation, Initiated by: Prof. Anindya Sarkar)
- Top International Conferences travel (preferably for women) under CSR Initiative of Infosys Foundation.
- Balmer Lawrie Scholarship under CSR Initiative of Balmer Lawrie & Co. Ltd. Kolkata for SC/ST /PC students.

CCC Project Proposal -4

1. **Area:** Rural Development Projects
2. **Name of the Project:** Development of Technical Skill Based Micro-Entrepreneurship through Hands-on Training and Digital Media to Promote Self-Employment
3. **Project Brief:**

Many people in the vicinity of factories and industrial projects are subjected to enormous economic disparity and hardship especially owing to displacement. In order to create sustainable livelihood both for people around industries and public at large through skill development this project aims to train young individuals across the country in various skills for their self-employment as also to make them employable. Training will be the vehicle in this regard and the appropriate training need for the demography will be determined through relevant study. Two stage training is intended: (1) video demonstration in the particular domain that a prospective person intends to get training followed by (2) hands-on training at IIT Kharagpur by experts in the modules to be set up. The best possible pedagogy will be designed through research. The digital contents will provide early but elaborate detailed guidelines so as to minimize logistics and provide flexibility of learning time, pace, and geographies. The best available experts with demonstrable competency in the respective skill domain will be selected to create the digital content for effective learning. Hands-on training will be organized at IIT Kharagpur after a person gains a level of competency through the video demonstration. They will be offered real life projects and on completion of the training some certificate will be issued to those demonstrating desired proficiency. All the expenses such as travel, local hospitality, and consumables used during the training will form part of the budgeted expenses.
4. **Total Fund Requirement:** INR 50 lakh
5. **Time for Completion:** 2 years
6. **Professor(s) In-Charge:** Dr. Pranab K Dan & Dr. Manoj K Mondal
Rajendra Mishra School of Engineering Entrepreneurship (RMSoEE)

CCC Project Proposal -5

1. **Area:** Rural Development Project
2. **Name of the Project:** *Tribal Development through Connecting, Engaging, and Developing Grass-Root Innovations*

3. **Project Brief:**

Tribal people represent 8.6% of the nation's total population, while most of them are economically and educationally backward. However, the facts revealed that they have a huge potential in terms of their traditional knowledge, skill and new ideas which can be defined as grassroots innovation. This shows an inequality scenario of development of the rural people in India. Only a small number of tribal people have been benefited by the policies and programmes meant for their development. In this regard, the CSR activity can be act as a potential strategy for development of tribal people. Since grassroots innovation can be seen in terms of creation of new opportunities by connecting tribal's innovation through networking and intervening with ICT based technology. On the other hand, in connecting tribal people to organizations, the tribal take an active engagement in sharing their knowledge and ideas in order to create new opportunities for their economic development.

The key issue, thus, is of bridging gap of untapped tribal innovation potential and relevant opportunities for tribal development through connecting them regionally- engaging them in identifying and making solution, in developing Grass root innovation with the intervention of ICT based technologies and mobile apps. In this regard, an articulate and effective strategy of conscious idea of tribal needs to be developed which would be capable of making calculated moves to create new opportunities for economic development of tribal people in 5 districts of West Bengal.

4. **Total Fund Requirement:** INR 1 crore (scalable to geographic expansion)
5. **Time for Completion:** 3 Years
6. **Professor(s) in Charge:** Dr. Bhaskar Bhowmick
Rajendra Mishra School of Engineering Entrepreneurship (RMSoEE)

CCC Project Proposal -14

1. **Area:** Rural Development
2. **Name of the Project:** Financial Inclusion and Rural Development: The Study of Paschim Medinipur Villages Near to IIT Kharagpur
3. **Project Brief:** Financial inclusion is a key to economic growth and development. The robust financial services boost economic growth by mobilizing savings for productive use, distributing capital funds efficiently and managing risks. Financial intermediaries and financial markets are essential for a vibrant, growing economy. For a real economic upturn, however, everyone must participate. The statistics reflects that about three-quarters of the world's population has no access to even a bank account. Financial inclusion is the ability of all citizens to invest in their livelihoods, exercise control over their financial resources and overcome income and capable poverty. In fact, the global agenda, fixed by United Nation, is to put 'sustainable financial services' and 'full participation' of excluded people in the financial sector. This is highly required in the country like India and most desirable in the West Bengal state due to its economy condition. NSS, IIT Kharagpur made an effort towards this financial inclusion plan by doing various surveys, developing mechanisms and motivating people to participate in this process. In this proposal, all the villages of Paschim Medinipur can be brought under self-sustaining stage through the followings:
 1. Examining socio-economic issues that hinder the process of financial inclusion.
 2. Examining the level of rural development in these selected villages.
 3. Identifying the factors that affect rural development.
 4. Linking financial inclusion with rural development.
 5. Organizing awareness programmes for this financial inclusion
4. **Total Fund Requirement:** Rs 42, 80,000.00
5. **Time for Completion:** 3 Year

Details	Year 1	Year 2	Year 3
Manpower (Two Project Officers @ Rs 20000/- per month and two Project Assistants @ Rs 7,500/- per person per month)	6.6	6.6	6.6
Organizing trainings for self-sustaining activities	4.0	3.0	3.0
Organizing awareness programmes	4.0	3.0	3.0
Contingency	1.0	1.0	1.0
Total	15.6	13.6	13.6

6. **Professor(s) In-Charge:**
 1. Dr Rudra. P. Pradhan, Vinod Gupta School of Management, IIT Kharagpur, WB 721302. Tel: 03222 282316. E mail: rudrap@vgsom.iitkgp.ernet.in.
 2. Dr D Roy, Program Coordinator and Head, National Service Scheme, Department of Civil Engineering, IIT Kharagpur, WB 721302. Tel: 03222 283456. Email: debasis@civil.iitkgp.ernet.in.

3. CCC Project Proposal -15

1. **Area:** Rural Development, Health
2. **Name of the Project:** *E-Market design for potato trading in West Bengal and understanding the role of Contract farming as a risk reduction mechanism in potato.*

3. **Project Brief:**

West Bengal holds a key position in area of cultivation and production of potatoes and is the second largest producer after Uttar Pradesh. Like many agri-commodities, potato prices move quite erratically. Coupled with inadequate marketing channels, lack of adequate cold storage facilities, manipulations by middlemen and the absence of support prices make potato cultivation in West Bengal inherently risky – regularly gets manifested by farmers' suicide. The severity of the problem can be judged from the fact that during February –March 2015, 17 potato farmers have committed suicide.

West Bengal potato economy is also experiencing an emergence of contract farming. Companies such as Pepsico, ITC Foods, Parle and Keventer Agro have started procuring potatoes from farmers through contract farming arrangements. Though contract farming may have come as succor to some potato farmers, but the robustness of any economy/market place is proved when buyers and sellers are free to choose the counterparties to trade.

With the boom in ICT technology, Indian agri-market is experiencing emergence of e-marketplaces for online trading commodities in spot and forward markets. Many states in India are focusing on creating these online market infrastructures.

A case in point is ReMs Ltd of Karnataka. ReMs Ltd is a unified online market for agricultural produce in Karnataka and provides electronic auction system across the state for transparent price determination linking buyers and sellers. Many other states such as Maharashtra, Uttar Pradesh have done considerable progress to link spot and forward markets for better price discovery. However, West Bengal's effort in providing wider market access to farmers has remained lackluster.

In light of this discussion, the major objectives of the projects are:

1. To survey modalities of contract farming in potato in West Bengal.
2. To analyze benefits accruing to farmers engaged in contract farming vis-à-vis farmer's without contract farming.
3. To prepare a roadmap for creation of an online potato spot and forward market linking major potato trading centers of West Bengal.
4. To design a e-auction platform for farmers, traders and bulk buyers for transparent price discovery and wider market access.

4. **Total Fund Requirement:**

Recurring and Non-recurring (lakh)			
Year	Recurring	Non-recurring	Total
I	7.5	4	11.5
II	7.5	2	9.5
III	7.5	2	9.5
Total	30.5		
Institutional charges @20% (IITKgp)	7.625		
Grand Total	38.125		

5. **Time for completion:** 2.5 years

6. **Professor(s) In-Charge:** Dr.(Mrs) Prabina Rajib
Professor (Finance & Accounts)
Vinod Gupta School of Management
Indian Institute of Technology, Kharagpur
West Bengal- 721 302, India
Phone:+91 3222 283886 (off), 283483 (Res)
Mob: +91 94340 04940
Email: prabina@vgsom.iitkgp.ernet.in

CCC Project Proposal -16

1. **Area:** Rural Development, Environmental Sustainability
2. **Name of the Project:** *Setting-Up Biogas Production Plants Using Different Waste Material In Village*
3. **Project Brief:**

In rural areas in India major part of the energy requirement is in domestic sector and is met by fuel wood and cattle dung cake. This is not a healthy practice , which needs to be changed to improve rural economy as also the quality of life. In this context biogas is an efficient domestic fuel which keeps the house and environment clean unlike burning of wood or dung cake which is associated environmental pollution. In addition, biogas is a decentralised system as a result household becomes self sufficient on domestic energy requirement. The Biogas centre located at IIT-Kharagpur has capacity and past 25 years experience to provide training to the villagers and setting up domestic plants in rural areas. The research team has also conducted research work for generation biogas by using various wastes. In this proposal, it is proposed to set-up few biogas plant in rural village , arrange awareness and training program, so that benefits are visible to villagers. The project fund being applied for will be primarily utilized for setting up domestic plants in the selective villages of nearby blocks of IIT-Kharagpur, so that the villagers can obtain clean cooking fuels alongwith biofertilisers.
4. **Total Fund Requirement:** 15 Lakhs
5. **Time for completion:** 3 years
6. **Professor(s) In-Charge:** Prof. B. C. Meikap
Professor
Department of Chemical Engineering
Indian Institute of Technology (IIT), Kharagpur
Dist: Midnapur(W)
Kharagpur-721 302 , West Bengal, INDIA
Phone: +91-3222-283958(Office)
Fax: +91-3222-2250
Mobile: +919474624980
E. Mail: bcmeikap@che.iitkgp.ernet.in
bcmeikap@yahoo.in

CCC Project Proposal -17

1. **Area:** Rural Development, Environmental Sustainability
2. **Name of the Project:** *A Smart Water Management and Intruder Detection System for Irrigated crops using Internet of Things in Rural Areas.*
3. **Project Brief:**
 1. Design and development of Internet of Things (IoT)-based autonomous system for water management and intruder detection in irrigated crops field in rural area.
 2. Design and development of low-cost water level sensor and wireless sensor node.
 3. Design of a robust algorithm for data handling, data analysis, real-time sensing, and real-time actuation.
 4. Auto-alert system to the farmers for different activities in the irrigated crops field.

4. **Total Fund Requirement:**

Recurring and Non-recurring (lakh)

:

Year	Recurring	Non-recurring	Total
I	12.48	15.00	27.48
II	12.48	15.00	27.48
III	12.48	12.00	24.48
Total		79.44	
Institutional charges @20% (IITKgp)		15.888	
Grand Total		95.328	

5. **Time for completion:** 3 years

6. **Professor(s) In-Charge:**

Dr. Sudip Misra
Associate Professor
Department of Computer Science & Engineering
Indian Institute of Technology
Kharagpur-721302
West Bengal, India
Tel: +91-3222-282338
Fax: +91-3222-255303
Email: smisra@sit.iitkgp.ernet.in, smisra.editor@gmail.com
Web: <http://www.sit.iitkgp.ernet.in/~smisra/>

Co-PI:

Dr. N. S. Raghuvanshi
Professor
Agricultural & Food Engineering
Indian Institute of Technology
Kharagpur-721302
West Bengal, India

CCC Project Proposal -18

1. **Area:** Rural Development

2. **Name of the Project:** *Low cost Sanitary system*

3. **Project Brief:**

The surrounding villages of IIT campus do not have adequate sanitary facilities and it is of utmost importance to implement sanitary system to enhance the quality of life and make it hygienic. With this aim in mind, it is proposed to implement low cost sanitary system for the villagers in the vicinity of IIT campus. A small tribal village named "Paiknagari" has been picked up for the same and the preliminary study demonstrates that there are about 150 households where sanitary system is to be installed. We intend to adopt our low cost sanitary system to be adopted in this village.

4. **Total Fund Requirement:** 50 Lakhs

5. **Time for completion:** 2-3 years

6. **Professor(s) In-Charge:** Prof. S. K. Bhattacharyya, Civil Engg.

CCC Project Proposal -20

1. **Area:** Rural Development, Environmental Sustainability
2. **Name of the Project:** *Ultra low cost arsenic filter for contaminated villages in West Bengal*

3. **Project Brief:**

Arsenic contamination in groundwater is a burning global issue. In Bengal Delta of Bangladesh and West Bengal, India, it is considered one of the biggest natural calamities of 21st century. Consumption of arsenic contaminated groundwater causes over 6500 deaths a year and over 2.5 million people develop arsenicosis in next 50 years. Long time consumption causes lung, bladder, kidney, liver and skin cancers. It is recognized not only for health hazards, but also for potential social problem. Victims and their families suffer from social discrimination, and refusal by community. There are no medical remedies to combat this disease. Arsenic contamination is found in many South Asian, North and South American and sub-Saharan countries in Africa. To address this issue, World Health Organization recommended the maximum level of arsenic in drinking water as 10 µg/L. 99% of population exposed to arsenic contamination lives in remote rural areas. Therefore, developing economical, effective, reliable and eco-friendly treatment technique for contaminated groundwater is critical and has gained considerable attention in recent years.

Thus, objectives of this proposal are: (i) To supply domestic filters (100 l/day capacity) in two arsenic contaminated village in the state of West Bengal using laterite based technology; (ii) Analysis of social and health impact of arsenic contamination before and after providing safe drinking water; (iii) Conduction of programs for awareness generation, training, health impact assessment and capacity building.

4. **Total Fund Requirement:** 1.2 crores
5. **Time for completion:** 2 years
6. **Professor(s) In-Charge:** Prof. Sirshendu De, Department of Chemical Engineering, IIT Kharagpur

CCC Project Proposal -21

1. **Area:** Rural Development
2. **Name of the Project:** *Internet of Things-Enabled Low-Cost Wireless Body Area Network for Ubiquitous Smart Healthcare Management System in Rural Hospital.*

3. **Project Brief:**

The major objectives of the projects are:

1. Design of a low cost Wireless Body Area Network (WBAN).
2. Design of an algorithm for patient's data privacy.
3. Continuous monitoring and diagnosis of patient's health from a remote location (city hospital).
4. Design of dual mode communication-enabled local processing unit (LPU) of WBAN and Web Server to maintain seamless and robust communication service. The dual mode ensures real-time monitoring and diagnosing of patient's health from any location.

4. **Total Fund Requirement:**

Recurring and Non-recurring (lakh)

:

Year	Recurring	Non-recurring	Total
I	12.48	20.00	32.48
II	12.48	20.00	32.48
III	12.48	15.00	27.48
Total		92.44	
Institutional charges @20% (IITKgp)		18.488	
Grand Total		110.928	

5. **Time for completion:** 3 years

6. **Professor(s) In-Charge:**

Dr. Sudip Misra
Associate Professor
Department of Computer Science & Engineering
Indian Institute of Technology
Kharagpur-721302
West Bengal, India
Tel: +91-3222-282338
Fax: +91-3222-255303
Email: smisra@sit.iitkgp.ernet.in, smisra.editor@gmail.com
Web: <http://www.sit.iitkgp.ernet.in/~smisra/>

CCC Project Proposal -22

1. **Area:** Rural Development
2. **Name of the Project:** *Cost Effective Housing using Construction and Demolition Recycled Aggregates*
3. **Project Brief:**

The construction industry worldwide is using natural resources and disposing of construction and demolition waste to landfill sites in very large quantities. Both practices are damaging to the environment and are no longer considered sustainable at their current levels. One of the most environmentally responsible and economically viable ways of meeting challenges of sustainability within the construction industry is the use of recycled concrete and demolition waste as aggregate in new construction. Whilst this is recognized as a potential outlet and technologies and standards required for such use are being researched and developed, a great deal of work is needed before Recycle Aggregate (RA) can be realized as a valuable resource.
4. **Total Fund Requirement:** Rs. 50 Lakhs for demonstrative low cost houses along with practical and simple guidance document for the use of recycled aggregate in building low-cost houses.
5. **Time for completion:** 3 years
6. **Professor(s) In-Charge:**

Sudhirkumar Barai

Professor, Department of Civil Engineering

IIT Kharagpur, Kharagpur 721302

Email: skbarai@civil.iitkgp.ernet.in; sudhirkumar.barai@gmail.com

Phone: 9434018649

CCC Project Proposal -23

1. **Area:** Rural Development
2. **Name of the Project:** *Skill Development and Entrepreneurship for Rural Youth*
3. **Project Brief:**

The objective of this projects to identify groups of unemployed youth of a cluster of villages around IIT,KGP from lower income group, bring them to RDC,IIT KGP and give them skill and entrepreneurship training of short duration .Depending on the nature and type of trade the training duration from minimum one week to six weeks. This will provide them necessary motivation and skill for taking up self employment in their areas .In the entrepreneurship portion of the training the trainees will take up a business idea, have market survey done and make a project report.RDC will also help in facilitating for loan from banks.

There is a mechanism for follow up and hand holding the rural youth for their settlement.

IIT,KGP has following strengths to have the project executed:

- 1.RDC infrastructure for conducting these training programs
- 2.Faculties from different departments to conduct classes. Students of IIT, KGP can also volunteer or teaching. IIT's brand name will help in getting candidates for training.

In this project we can train 720 candidates in 3 year who will become skilled and can become either self employed. This project can also be extended to other clusters and neighboring states. This project is in line with GOI's focus on Skill India and Start Up-Stand Up India..

4. **Total Fund Requirement:** 2.31 Crores
5. **Time for completion:** 3 years
6. **Professor(s) In-Charge:** Prof. V.K Tewari,Chief Co-ordinator
Prof. K.N. Tiwari, Co-ordinator Prof. P.K. Bhowmick Prof. D.K Swain
Prof. P.P.Srivastav RDC,IIT,Kharagpur

CCC Project Proposal 31

1. **Area:** Rural Development Project/ Environmental Sustainability
2. **Name of the Project:** Climate adaptive sustainable farming system design for small and Medium farms
3. **Project Brief:** In an effort to address the needs of small and medium farmers, this project aims to establish a sustainable farming system in rainfed ecosystem by systematic implementation of technology. It envisages zero waste production by recycling the farm waste as a resource for bio-energy and bio-fertilizer production. With the right blend of organic and conventional inputs in integrated farming, the proposal aspires to develop a disaster resilient rural ecosystem, synchronizing with reduction of carbon and water footprints. It also endeavors inclusive socio-economic growth in agriculture and allied sectors, a much-needed outcome, to reduce inequalities.
Objective
 - To develop a sustainable farming system with zero farm wastage for inclusive rural development.
 - To introduce profitable climate-adaptive crop production systems with reduced impact on environment
4. **Total Fund Requirement:** INR 40.00 lacs
5. **Time for Completion:** 3 years
6. **Professor(s) In-Charge:** Prof. Dillip Kumar Swain,
Associate Professor Agricultural and Food Engineering Department
Indian Institute of Technology Kharagpur
Kharagpur - 721 302
INDIA
Phone :03222 283170 (Office)/ 9933023760 (Mobile)
e-mail:swain@agfe.iitkgp.ernet.in

CCC Project Proposal 34

1. **Area:** Rural Development Projects
2. **Name of the Project:** : Low Cost Water Quality Improvement Technique for Rural People Using Hydrocyclones
3. **Project Brief:** Sustainable access to sufficient safe drinking water is an emerging challenge with increasing population and per capita usage. About 80% of the communicable diseases worldwide are water born. Among the various undesirable and naturally occurring pollutants in water are suspended solids including microorganisms (protozoa, bacteria). Recently hydro cyclones have been used to separate yeast cell from alcoholic fermentation broth, mammalian cell separation and even fine organic particles of $1\mu\text{m}$ size range. Most waterborne pathogenic protozoa have size range from 4 to 20 μm ; the bacterial size ranges are 1 to 10 μm . Therefore, most of them can easily pass through the mostly used membrane filters. Bacterial cells are generally harvested during centrifugation at the range of 1000 to 12000 $\times g$.

Hydrocyclone separation technique, based on centrifugal sedimentation principle is a typical Separation technique widely used for particle separation. However, they have no movable parts; no chemicals are required and extremely easy to operate with minimal cost. Fluid is tangentially directed into the hydro cyclone which causes it to spin. The spinning motion generates strong centrifugal forces which induces the solid and liquid to separate. The centrifugal force generated In a hydrocyclone varies over its length, and may reach a maximum of 20000g's. Therefore, removal of water pathogens along with other fine suspended particles in hydrocyclone is a realistic possibility.

As the design of a hydrocyclone depends on the specific application, the focus of this project is to optimize the design parameters of a hydrocyclone to optimize the removal efficiency of suspended solids from water collected from various rural sources. The entire research outcome may pave the way to develop a hydrocyclone based portable water clarifying unit to serve the community in need- a concept of water ATM for rural India.

4. **Total Fund Requirement:** INR 29.5 lacs
5. **Time for Completion:** 3 years
6. **Professor(s) In-Charge:** Prof. Arun Kumar Majumder of the Department of Mining Engineering, IIT, Kharagpur

CCC Project Proposal 35

1. **Area:** Rural Development Projects
2. **Name of the Project:** : CSR based Field to Market Empowerment of Farmers for Organic Farming of Badshabhog Aromatic Rice in the Surrounding Areas of Kharagpur

3. **Project Brief:** High-yielding seed varieties and intensive chemicals based farming has been instrumental in eroding the rice genetic biodiversity including aromatic rice in parts of West Medinipur, West Bengal. Repeated cultivation of non-indigenous high-breed paddy causes an adverse effect on the land -deteriorating its fertility. Moreover excessive use of chemical fertilizers and insecticides hamper ecological balance, too. All these pose serious threats not only for the indigenous species but also to the farming community-concerning environmentalists, scientists and the policymakers- in number of Eastern Indian states like West Bengal, Assam, Bihar and Odisha.

Badshabhog is an indigenous variety of rice cultivated nowadays in some pockets of West Medinipur , now under threat. The quality, aroma and reputation have been lost gradually with the indiscriminate adoption of chemically intensive farming. Restoration of the same with modern organic farming practice would pave the way for greater access to domestic and international market- raising soil quality as well as farmers' income. Such practices would be environmentally more benign as well as would help rural health and economy.

Therefore, the idea is to help some progressive farmers to adopt organic farming in some cultivable lands with Badshabhog rice cultivation.

The initiative would include:

- reaching to the farmers, explaining them the benefits;
- helping them with organic/bio fertilizers, growth promoters, pesticides, etc;
- helping them in cultivation; ensuring fair price for the produce and access to the market; and helping them get premium price. .
- It is proposed to adopt about 50decimals land each from 10 farmers at different pockets for 3 years, cultivate Badshabhog rice in organic methods twice per year,
- awareness generation, organic produce certification and marketing of the final product at the state and national markets.
- The cultivation, harvest and organic certification costing would be on sharing basis with respective farmers. The outcome would be major awareness about organic farming, environmental sustainability, strengthening of rural economy, food safety and security as well as corporate advertisement for those who would invest in this project.

4. **Total Fund Requirement:** INR 28'12'000.00 (breakup will be provided if requested)

5. **Time for Completion:** 3 years

Timeline and Milestone

	6 months	1 year	1.5 year	2 year	2.5 year	3 year
Staff selection and appointment	√					
Selection of farmers	√					
Convincing for organic farming	√					
Final farmer and land selection	√					
Farmers training	√		√		√	
Commencement of project	√					
Cultivation by organic farming		√	√	√	√	
Harvesting and processing			√	√	√	√
Marketing and sales of produce		√	√	√	√	√
Awareness programme and advertisement	√	√	√	√	√	
Organic Certification		√		√	√	
Draft preparation					√	√
Visit of Corporate personnel funding the project	√	√	√	√	√	√
Final report preparation and submission						√

6. **Professor(s) In-Charge:** Jayanta Bhattacharya, PhD

Head, School of Environmental Sciences and Engineering and Professor, Department of Mining Engineering, Indian Institute of Technology Kharagpur. Email: jayantab@mining.iitkgp.ernet.in; jayantaism@gmail.com

Bidus Kanti Das, Ph.D

CEO, Pranam Laboratories Products and Services, Hijli Co-operative Society, Kharagpur email: bidus123@gmail.com; pranamlab@gmail.com

CCC Project Proposal 37

1. **Area:** Rural development, Hunger, Poverty, Malnutrition and Health, Environmental sustainability
2. **Name of the Project:** : Benchmark Data Set Creation and Annotation for Cultural Preservation of Bharatanatyam
3. **Project Brief:** Solid waste management in rural settlements of India is a major issue of concern considering rural health and environment. This requires immediate intervention which is significantly different from urban areas due to location and scale factors, availability of a ready market for refuse reuse and diverse user perception due to varying levels of education, income etc. In addition to interventions like waste reduction and segregation, solid wastes in rural areas can be made a possible resource through recycling recyclable materials, converting organic waste to compost and secured disposal of remaining waste through proper technology and appropriately designed infrastructure which is acceptable to rural people. One of the reasons for poor performance of infrastructure projects in rural areas is that the people's priorities, perceptions and the local knowledge are not taken into consideration while making decisions which results in wrong choice of technology, management mechanisms and user charges. The present study aims to determine the appropriate service delivery levels and mechanisms for solid waste management in rural settlements based on local knowledge and user perception.
Scope of work:
 1. To study the existing practices of solid waste management in selected rural settlement
 2. To identify the appropriate attributes defining various aspects, technology options and infrastructure for rural solid waste management based on user perception
 3. To define service delivery levels for different aspects and technology of solid waste management and associated infrastructure and facilities incorporating local knowledge and user perception
4. **Total Fund Requirement:** INR 30 lacs
5. **Time for Completion:** 3 years
6. **Professor(s) In-Charge:** Prof. Debapratim Pandit,
Associate Professors, Architecture & Regional Planning Department, IIT Kharagpur

CCC Project Proposal 42

1. **Area:** Rural Development and Environmental Sustainability
2. **Name of the Project:** : Addressing Childhood Malnutrition in Our Backyard
3. **Project Brief:** Objective: The prime objective of the work is to ensure adequate and healthy drinking water supply for 100 families of two villages using pond water post appropriate treatment
Location: Village Daspara Sumatinagar-II, and Digambarpur, in the district of South 24 Parganas
Brief description:
With the sizeable lowering of the groundwater water table for freshwater pumping, in many of the village clusters in the district of South 24 Parganas, managing domestic freshwater demands is getting increasingly difficult, especially for the deprived communities. Although there are several ponds with substantial water storage in the villages, the poor water quality makes it unhealthy to use such waters.



Fig 1: A pond in Daspara Sumatinagar-II proposed for the project

A simple low cost water treatment system will be designed for 20 kL/day supply comprising of a solar powered pump, a baffled mixing tank and a sand-bed filter unit. Alum and chlorine doses will be used for coagulation flocculation and disinfection, respectively. The water coming out of the filter bed will be fit for all household uses post chlorination including drinking, cooking washing clothes and utensils etc. The schematic figure of the water purification system is shown below in Figure 2.

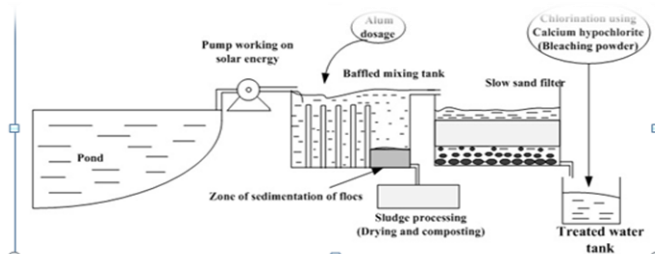


Fig 2: A typical schematic of the proposed treatment scheme

4. **Total Fund Requirement:** INR 28 lacs

5. **Time for Completion:** 6 months

6. **Professor(s) In-Charge:** Prof. Manoj Kumar Tiwari, School of Water Resources, & Prof D.Roy, Deptt. of Civil Engineering & Chairman (Civil Construction and Maintenance) & Professor B. Dubey Deptt. of Civil Engineering
Associate: Sri S.K.Biswas , Executive Engineer (Civil)

CCC Project Proposal 47

1. **Area:** Rural Development
2. **Name of the Project:** : Supply Chain Management and Economic Value Addition of Selected Non-timber Forest Products among the Tribal Communities in North East India
3. **Project Brief:** Non-timber Forest Products (NTFPs) have tremendous potential for creating employment opportunities, reducing poverty and empowering people particularly the tribes in the backward districts of India. However, the NTFPs supply chains are unduly long, and primary collectors get only a fraction of the price paid by the end-consumers. The narrow NTFPs base needs to look for various alternative uses to improve collectors' returns and reduce future uncertainty. The present proposal will investigate the supply chain and economic value addition of NTFPs in North East India with emphasis on micro-entrepreneurial development, gender empowerment, etc., as about 60–94% of the population in the region is dependent for various purposes on forest resources. Although the NTFPs possess a good market demand, the poor packaging and marketing strategies, lack of market information coupled with deprived market price discourage the tribes particularly the women to go for commercial development of such products.
This study will be based on primary and secondary data to be collected from the tribal communities who are involved in harvesting, processing, packaging, and marketing the products at different levels in Arunachal Pradesh, Assam, and Meghalaya. It will be specific to NTFPs like Wild Orchid, Bamboo shoot, Kola kachu (Paris polyphylla), and Caterpillar fungus (Cordyceps sinensis) many of which are even smuggled to neighboring countries for commercial use.
4. **Total Fund Requirement:** INR 27,67,212 (breakup will be provided if requested)
5. **Time for Completion:** 3 years

Table 2: Tentative timeline for different project activities

Sl. No.	Activity	0-6 Months	7-12 Months	13-18 Months	19-24 Months	25-30 Months	31-36 Months
1	Recruitment of Junior Research Fellow (JRF), and Project Assistant (PA). Completion of literature review	3 months					
2	Study area visit to make preliminary survey, meeting with local communities, government officials, probable respondents, and NGOs related with NTFPs	2 months					
3	Development of interview schedule for pilot survey	1 month					
4	Recruitment of Field Investigator (FI), and training for data collection and pilot testing of the interview schedule		2 months				
5	Preparation of final interview schedule; interview with the respondents, processing units (if any), etc., and collection and cross checking of primary data		10 months				
6	Collection of other information through FGDs and collection of secondary information				3 months		
7	Feeding data into computer and standardization				3 months		
8	Data analysis					6 months	
9	Interpretation of results						3 months
10	Preparation of draft, and submission of final project report						3 months

6. **Professor(s) In-Charge: Prof. Kishor Goswami** Associate Professor of Economics
Department of Humanities & Social Sciences Indian Institute of Technology Kharagpur
West Bengal 721 302, India Ph.: +91 3222 281770 (O)/ +91 9932573305(M)
Fax: +91 3222 282270 / 255303 E-mail: kishor@hss.iitkgp.ernet.in , kishor_00@yahoo.com

CCC Project Proposal 50

1. **Area:** Rural Development Project
2. **Name of the Project:** : Providing Drinking Water and Electricity in Rural Village through Solar PV
3. **Project Brief:** Drinking water is a scarcity in most of the interior villages. Golghoria village, which is situated about 6KM from IIT Kharagpur, is one of the tribal villages lacking even basic facilities. We, through NSS activities, are engaged in supporting the village primary school and undertake various activities such as teaching , maintaining cleanliness, tree planting, etc. There is a severe shortage of drinking water in the village and also the electricity supply. This detrimental to the overall growth of population of the village, particularly the children. It is planned to install a 5HP solar pump in the school premises from which the drinking water can be supplied to few other locations through pipe and overhead tanks. The spare electricity generated will be stores and will be used for lightening purpose. After successful implementation in Golghoria village, this scheme can be extended to other villages as well. The Professors in-charge have significant experience of designing and implementing such systems.
4. **Total Fund Requirement:** INR 25 lacs
5. **Time for Completion:** 3 years
6. **Professor(s) In-Charge name(s) and affiliation(s) :** Prof J N Roy : Advance Technology Development Centre (ATDC) and School of Energy Science & Engineering (SES&E) and Prof D Roy : Civil Engineering Department.

CCC Project Proposal 52

1. **Area:** Rural Development Project(Sanitation)
2. **Name of the Project:** : Design of mobile collapsible units for basic facilities for fairs and festivals and its distribution plan at a regional level for reuse.

3. **Project Brief:**

- 1.0 **Background**

Hosting religious festivals and fairs of different scale is a common practice in Indian culture and it is annual affair observed on a specific time of the year for a certain period of time. It is usually based on the lunar calendar and as a regular practice it is planned with provisions of some basic infrastructure like toilets, drinking water, staying places, eateries, terminal facilities at designated places. The scale of the facilities is planned considering an expected footfall, usually based on historic records. The district administration is vested with the authority to arrange for such facilities involving , trustee and local bodies falling within the district. Funds from state and central exchequer are released every year according to the demand depending on the prominence of the festival. Listing of such fairs and festivals are recorded by the Tourism of India.

- 2.0 **Aim**

The proposal aims towards preparing a route plan such that designated number of mobile collapsible units they can be transported in carriages from place to place to facilitate such events, considering the scale, its starting time, duration, location, regional connectivity and its forward and backward link to reap the maximum benefit of the system.

- 3.0 **Objectives**

To meet this target the objectives would be to:

- 1.Designing dismantlable steel structural modules considering its stability, durability, maintainability, functionality appropriate to be carried in a standard vehicle in multiples to utilize the vehicle.
- 2.Study the time of the year, scale, nature and duration of events in a particular region, say eastern India in the scope of this project.
- 3.Listing and study of major events across India that may require augmentation from other regions as a support and assessing their requirement.
- 4.Locating the hubs along regional corridor for refurbishment and maintenance of the flexible modules.
5. Initial investment and Cost effectiveness of the proposal in terms of regular piecemeal investment by different stakeholders.

4.0 Methodology

The entire project can be taken up considering a sequence of tasks that are to be carried out simultaneously as well as sequentially.

Task 1A: Listing the fairs and festivals in India which are of very large scale, and the eastern region of India specifically (Bengal, Bihar and Orissa) and their regional level connectivity Review of documents and literature on Indian and International context on the current practices for such festivals government schemes in (Hot – humid zones of eastern India):

Study of light weight steel structures

The focus of study will be:

- i. Design and material consideration of low cost housing for the study area.
- ii. Principle and Contextual design parameters for unit design from indigenous case studies / literature review.
- iii. Study of climatic aspects, geo –spatial, and disaster resistance requirement in study area.
- iv. Building comfort issues related to solar protection and precipitation in study area.

Task 1B: Understanding user preference based on household size, composition, occupation, ethnicity and culture from literature review and case studies within study area.

Task 2A: Assessment of the eight technologies of BMTPC for the proposed prototypes considering cost efficiency, ease of implementation, geo – spatial and climatic aspects, suitability to user – profile in study area

Task 2B: Synchronizing the identified BMTPC technologies with micro – level architectural elements for improved performance of the designed prototypes in the study area

Task 2C: Incorporating principles of flexibility and incrementally within prototype design for user satisfaction in long term.

4. **Total Fund Requirement:** Scalable as per beneficiaries

5. **Time for Completion:** Scalable as per requirement

6. **Professor(s) In-Charge name(s) and affiliation(s) :**

1. Dr. Sumana Gupta, Assistant Professor, Dept. of ARP, IIT Kharagpur
2. Dr. S. P. Bhattacharya, Assistant Professor, Dept. of ARP, IIT Kharagpur
3. Dr. Arup Das, Assistant Professor, Dept. of ARP, IIT Kharagpur

CCC Project Proposal 53

1. **Area:** Rural Development Projects
2. **Name of the Project:** : Building of a community microgrid with seamless operation on and off the main power grid
3. **Project Brief:** Ensuring reliable power supply to remote villages can be considered as a benchmark of development for a country like India. However, addition of adequate generation facility and necessary transmission & distribution network faces constraints like funding and land availability. An alternative option may be to utilize the abandon solar power by setting up a solar microgrid. This project aims at establishing such a microgrid in small scale at IIT Kharagpur premises which can be replicated for rural electrification or to provide uninterrupted supply to critical loads like hospitals, colleges etc. In addition, this solar microgrid will help to reduce the carbon footprint.

The overview of the proposed microgrid is shown in Fig.1. An alternative network will be formed which will connect solar distributed generation (SDG) and load spread over an area. Seamless transfer of load between the main grid and the proposed microgrid will be achieved through electronic switches. These electronic switches are used to connect the SDG and the local load combined either to the utility grid - in one case - or to the microgrid - in another, so that the local load receives uninterrupted power in case the total power available from the SDG is insufficient. The solar converters and the transfer switches will be working independently without any fast communication link, thus, they will be robust and suitable for implementation in remote areas.
4. **Total Fund Requirement:** INR 32 lacs (breakup will be provided if requested)
5. **Time for Completion:** 3 years
6. **Professor(s) In-Charge name(s) and affiliation(s)** PI: Dr. Souvik Chattopadhyay, Electrical Engineering Co-PI: Dr. Dheeman Chatterjee, Electrical Engineering

IIT KGP- Trendsetters in CSR