



SYMBIO **GREENTECH**

PRIVATE LIMITED

An Incubate company

EKTA INCUBATION CENTRE *

Maulana Abul Kalam Azad University of Technology (MAKAUT)

(Formerly West Bengal University of Technology WBUT)

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* EKTA INCUBATION CENTRE

Technology Business Incubator (TBI)

Promoted by Maulana Azad Abul Kalam Azad University
of Technology (MAKAUT), Kolkata, West Bengal

Recognized and Supported by

National Science & Technology Entrepreneurship Development Board
(NSTEDB) under Dept. of Science & Technology (DST), Govt. of India.

&

MSME Govt. India

“Sustainability through Bioinnovation”

SYMBIO GREENTECH PVT.LTD.

“Sustainability through Bioinnovation”

MISSION

Committed to create a sustainable Clean & Green future by improving the Social, Economic and Environmental Excellence.

VISION

Enhancing and Protecting the Ecosystem on which all life depends.

COMPANY PROFILE

SYMBIO GREENTECH Pvt. Ltd. (SGPL) is an Environment Biotechnology company committed to provide innovative sustainable technologies for Environment Protection & Restoration, Urban Renewal, Rural development to create a sustainable CLEAN & GREEN Environment.

SGPL is an Incubate Company at EKTA Incubation Centre – Maulana Abul Kalam Azad University of Technology (formerly WBUT) supported by National Science & Technology Entrepreneurship Development Board (NSTDEB) & Department of Science and Technology Govt. of India for developing the Microbial technology in Beneficial Microbes (BM), sustainable plants, Bioenergy crops through Plant Biotechnology for sustainable environment management solutions for effective utilization of natural resources to rebuild the eco-system

Symbio Greentech is developing and practical application of eco-friendly sustainable technologies for Environment Protection and Restoration by the integration of Plant Biotechnology, Microbiology & Bio-engineering methodologies through effective utilization of natural resources to rebuild the eco-system.

We are focusing on holistic sustainable treatment measures for environment management through integrated interventions meticulously designed to safeguard our future generations.

TECHNOLOGY DEVELOPMENT AND APPLICATIONS

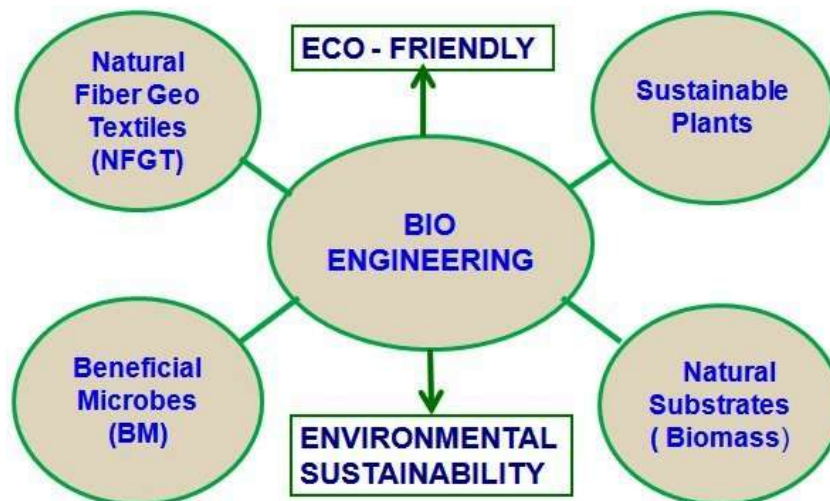
- Development of sustainable integrated eco-friendly technologies for Environmental Protection & Restoration for Urban Renewal
- Sustainable applications in contaminated Canal, Water body, Lakes Restoration, RO water Reject recovery, Grey water Management Treatment, Coastal wetland and Contaminated site management and restoration through Bio- remediation and Phyto-remediation techniques
- Application of Coir / Jute geotextiles, sustainable plants and beneficial Microbes in Slope Restoration, river embankments protection and restoration control the soil erosion & landslides through bio-engineering methodologies
- Integrated Solid Waste Management solutions – Odour Control and Rapid Decomposing methodology through Beneficial Microbial applications.
- Municipal Solid Waste dump site restoration green capping for leachate contamination control and land recovery
- Marginal Land & Mining area plantations, Thermal power plant Fly Ash dump site Restoration, biomass feed stock generation for clean energy.
- Sustainable urban environment management solutions & greenbelt Developments for Smart Green City Mission.

ENVIRONMENTAL CHALLENGES

- Contaminated Canals, Water Bodies & Lakes
- Decentralized Solid Waste Management
- Waste Dump Sites & Leachate Contamination Control
- Soil Contaminated Site Management
- Mining Area & Thermal Power Plant Fly Ash Dump Sites
- Industrial Effluent Treatment - RO Reject Water Recovery
- Grey Water Management
- Canal & River Embankment Restoration
- Wet Land Conservation
- Carbon Emission
- Disaster Risks
- Climate Change Impact

INDIGENOUS SUSTAINABLE GREEN TECHNOLOGIES ACCESSIBLE
TO MITIGATE THE ENVIRONMENTAL DEGRADATION

INTEGRATED ENVIRONMENTAL MANAGEMENT



MATERIAL USED FOR ENVIRONMENT ECO RESTORATION & METHODOLOGY

Jute & Coir Geo textile, Jute / Coir Biomass, Sustainable Plants, Bamboo and Beneficial Microbes (BM) isolated from Natural Sources to use in an integrated methodology through Bio-Remediation, Phyto-remediation & Bio-engineering

Application of NATURAL MATERIALS to PROTECT our NATURAL RESOURCES

The Bio-engineering techniques to Create Sustainable Urban Greenery, Ecological Balance and Low Carbon Resilience

SYMBIO GREENTECH Pvt. Ltd.

**SUSTAINABLE ENVIRONMENT MANAGEMENT THROUGH
BIO-ENGINEERING TECHNIQUES**



**JUTE / COIR GEOTEXTILES, GEO LOGS, BAMBOO STICKS, BENEFICIAL
MICROBES (BM) AND SUSTAINABLE PLANTS**



**SUSTAINABLE ECO RESTORATION
USING NATURAL MATERIALS TO PROTECT NATURAL RESOURCES**

PROJECTS IN ENVIRONMENTAL RESTORATION THROUGH BIO-ENGINEERING TECHNIQUES

WATER BODY RESTORATION

GLOSTER LTD.

Location - Jute Mill, Bauria, Howrah Dist, West Bengal.



Floating Garden Installation for Water De-contamination
BIO PHYTOPONIC SYSTEM - Cleaning Water Nature's Way

WATER BODY RESTORATION

GLOSTER LTD.

Location - Jute Mill, Bauria, Howrah Dist, West Bengal.



Floating Garden Installation for Water De-contamination

BIO PHYTOPONIC SYSTEM - Cleaning Water Nature's Way



WATER BODY RESTORATION & GREEN LIVELIHOOD DEVELOPMENT

Project Initiative by
Aditya Birla Jan Seva Trust (ABJST),
Jaya Shree Textiles, A Unit of Aditya Birla Nuvo Ltd.
under Corporate Social Responsibility (CSR), Rishra, West Bengal



Project Location – 10000 Sq.m Water Body near Rishra Railway Station



Project Design & Implementation - SYMBIO GREENTECH Pvt.Ltd

WATER BODY RESTORATION & GREEN LIVELIHOOD DEVELOPMENT



Community Awareness Campaign Environmental Protection



Floating Garden Installation for Water De-contamination

BIO PHYTOPONIC SYSTEM - Cleaning Water Nature's Way

WATER BODY RESTORATION



The Water body restoration project implemented by community participation and green Livelihood Development

Installation of 100 floating garden and embankment protection by Vetiver plants for organic and inorganic contamination reduction and natural water reclamation.

The restoration done by using floating gardens Coir & Jute Geo textiles, Biomass (Coco pith) and Vetiver plants Incorporated with Beneficial Microbes for Bio-remediation & phyto remediation

**Project Initiative by : Aditya Birla Jan Seva Trust (ABJST),
Jaya Shree Textiles, A Unit of Aditya Birla Nuvo Ltd.
under Corporate Social Responsibility (CSR), Rishra, West Bengal**

CANAL ECO RESTORATION

Howrah Municipal Corporation, Belgachia, West Bengal
Location - HMC Ward No. 8 Howrah



**SWM Dump site Leachate Canal Embankment protection & Floating Garden
Installation for Water De-contamination**

In-situ Bio-Remediation & Phyto-Remediation System

CANAL ECO RESTORATION

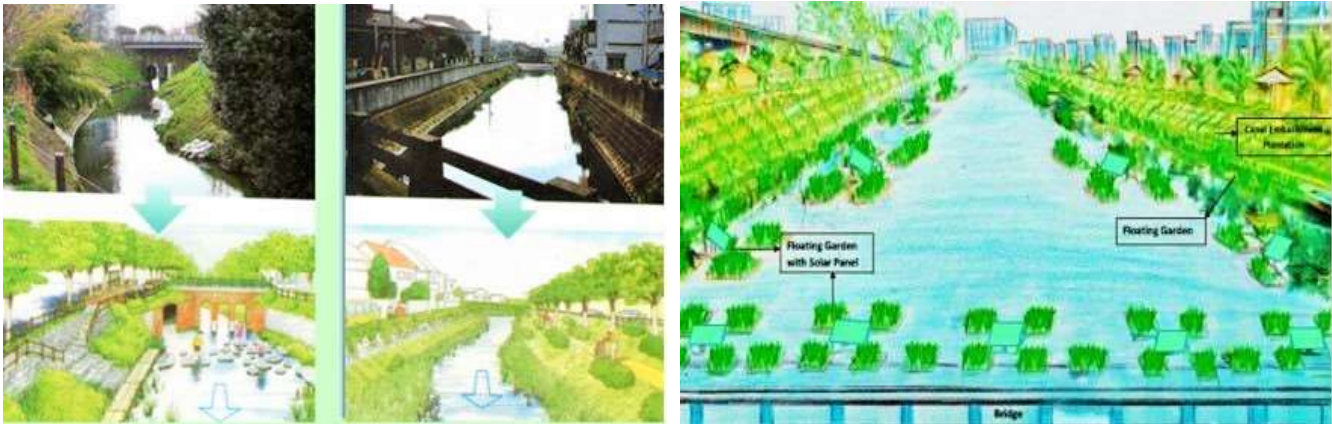
Howrah Municipal Corporation, Belgachia, West Bengal
Location - HMC Ward No. 8 Howrah



SWM Dump site Leachate Canal Embankment protection & Floating Garden Installation for Water De-contamination (60 days after Installation)
BIO PHYTOPONIC SYSTEM - Cleaning Water Nature's Way

This project is notified by ICLEI – Local Government for Sustainability on Initiatives & Innovation of Climate Change Cases from Urban India (<http://seas.iclei.org/>)

SUSTAINABLE ECO RESTORATION THROUGH BIOENGINEERING TECHNIQUES



SUSTAINABLE CANAL, WATER BODY RESTORATION & GREENING

Bio Phytoptic System “Cleaning Water Nature’s Way”

SYMBIO GREENTECH Pvt. Ltd.

“Sustainability through Bioinnovation”

SUSTAINABLE CONTAMINATED CANAL RESTORATION TECHNIQUES



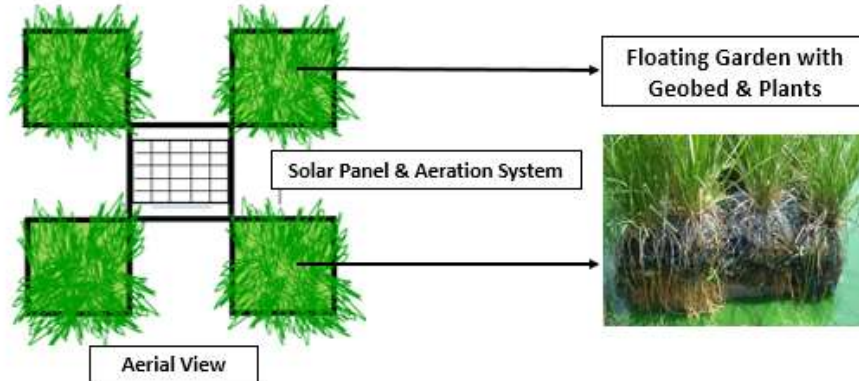
CANAL RESTORATION THROUGH BENEFICIAL MICROBES (BM) COIR / JUTE GEOTEXTILES (NATURAL FIBER & SUBSTRATES) AND SUSTAINABLE PLANTS

Bio Phytoptic System “Cleaning Water Nature's Way”

SYMBIO GREENTECH Pvt.Ltd.

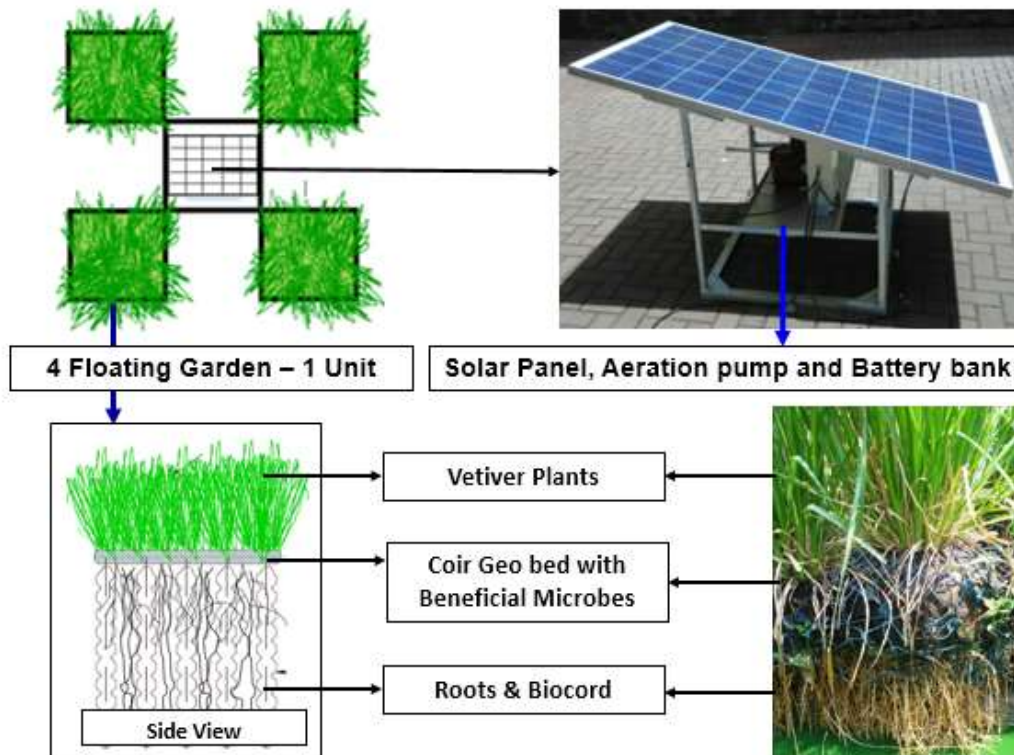
Water Pollution Management through Green Technology Interventions

The Integrated Floating Garden Bio-Phytoponic Solar Aeration system application for reclamation of contaminated water using natural materials through bio-engineering techniques



Material Used - Coir fiber bed, Biomass, Beneficial Microbes, Vetiver Plants, Solar Aeration unit for coir bed to support the aerobic microbes and BOD level reduction to rapid cleaning of water

FLOATING GARDEN BIO-PHYTO PONIC SOLAR AERATION SYSTEM



PATENT PENDING

"Cleaning Water Nature's Way"

URBAN RIVER BANK RESTORATION



Model of River Bank Restoration through Bio engineering methodology using Jute / Coir Geotextiles, Sustainable Plants to create a Clean & Green Ambience

Urban Renewal is very important in today's context Sustainable Urban development specifically means achieving a balance between the development of the urban areas and Protection of the Environment.

**OUR CITIES NECESSITATE A SUATAINABLE ENVIRONMENT
MANAGEMENT COMPLIANCE THROUGH AN
ECO-FRIENDLY URBAN RENEWAL TECHNOLOGIES TO CREATE
CLEAN & GREEN CLIMATE SMART CITIES**

COAL BASED THERMAL POWER PLANT FLY ASH DUMP SITE
STABILIZATION, RESTORATION & GREENING

National Thermal Power Corporation (NTPC)
Dadri, (Near New Delhi), Uttar Pradesh



Fly Ash dump area restored within 90 days without using soil
“Bio-Phyto Stabilization”

The fly ash dumpsite area problem like flying of ash in summer season and slurry formation, rain cuts and slurry movement to adjacent areas during rainy season are significantly reduced and lead to control the Air, Water and Soil pollution

The fly ash dump site restoration technique is 100 % Eco-friendly and practically applicable

BIO-ENGINEERING TECHNIQUES ON FLY ASH DYKE & RIVER SIDE PROTECTION

**Bakreswar Thermal Power Plant Project (BkTPP)
West Bengal Power Development Corporation Ltd.
Govt.of West Bengal**

FLY ASH POND & CHANDRABHAGA RIVER SIDE EMBANKMENT RESTORATION



Sustainable Fly Ash dumpsite protection and Restoration without using Soil to Control Flying of Ash and Slurry movement

A PERMENANT GREEN TECHNOLOGY SOLUTION FOR WATER, SOIL AND AIR POLLUTION CONTROL IN THERMAL POWER PLANTS

CHANDRABHAGA RIVER SIDE EMBANKMENT RESTORATION



Stabilized River Embankment



River Embankment Stabilization & Restoration through Bio-engineering techniques

VETIVER GRASS

Chrysopogon zizanioides (Vetiver)

A Wonder Grass for Environment Protection and Restoration



Vetiver Plantation for Slope and River Emnabkment Protection and Restoration

Bio-Phyto Stabilization

CANAL & RIVER BANK STABILIZATION THROUGH BIO-ENGINEERING METHODOLOGIES

Slope Stabilization and soil erosion control through the application of Jute / Coir Geotextiles, Sustainable plants, Natural substrates, Beneficial Microbes (BM) and Hydro seeding techniques

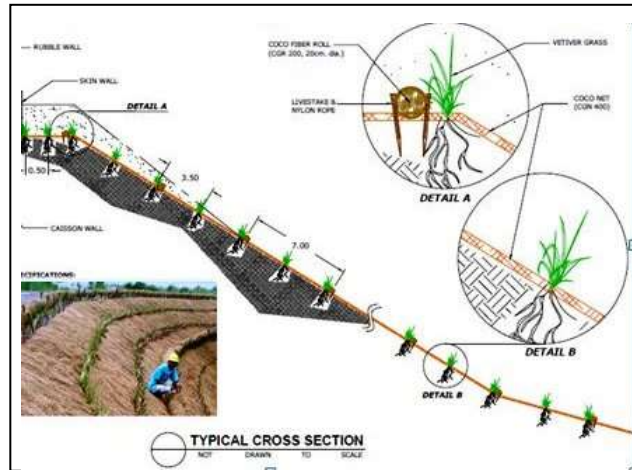


CANAL EMBANKMENT SOIL STABILIZATION AND RESTORATION



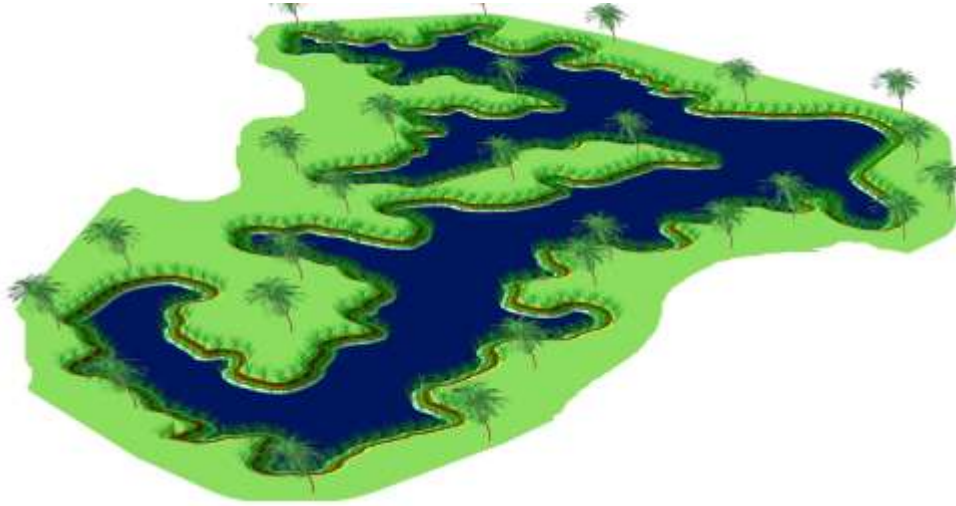
RIVER EMBANKMENT SOIL STABILIZATION & RESTORATION

RIVER EMBANKMENT PROTECTION & RESTORATION



The River Embankment Protection & Restoration through Bio-engineering technologies by using natural substrate like Jute geo textiles, coir geo textiles, coco peat, locally available biomass, Jute logs, Bamboo pegs & poles Beneficial Microbes (BM), Sustainable Plants like Vetiver, Arundo donax etc..

ECO- RESTORATION PROJECT DESIGNS



LAKE ECO- RESTORATION



URBAN ECO-RESTORATION, GREY WATER MGMT. & LANDSCAPE



VETIVER GRID PLANTATION FOR ECO- RESTORATION IN RURAL AREA

LOW-CARBON AND CLIMATE RESILIENT URBAN DEVELOPMENT THROUGH SUSTAINABLE ENVIRONMENT MANAGEMENT

SYMBIO – ORGANIC COMPOSTING SYSTEM (OCS)

Organic composting System for the rapid decomposing of Organic waste through the application of Beneficial Microbes (BM) to Microbial Compost for Soil Reclamation and use as a soil substitute for Environment Restoration , Agriculture , Horticulture and Floriculture applications



Organic Waste



Shredder



Pulvizer



Beneficial Microbes (BM)



Jute Bags



Plastic Crates



Compost Crate Rack



Compost

Plastic crates with Jute inner lining can be used for stalking the processed waste for mass production

Organic Solid Waste Management through BM Organic Composting System (BM-OCS) leads to a effective recycling of Urban and Rural organic waste to BM-Compost to create a Clean and Healthy Environment.

RESIDUAL WASTE MANAGEMENT

MATERIAL RECOVERY FACILITY (MRF)

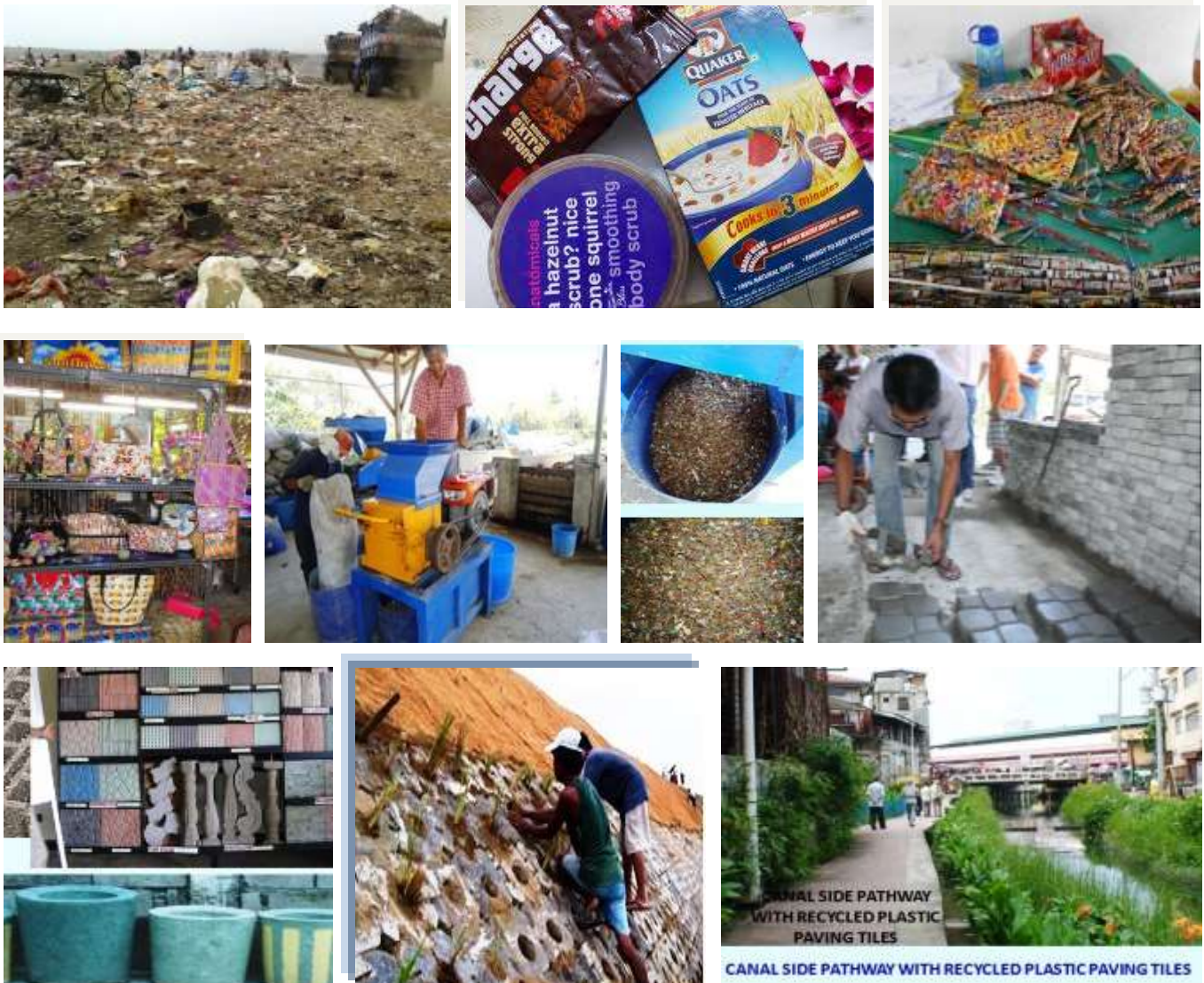
PLASTICS WASTE: ENVIRONMENTAL ISSUES AND CHALLENGES

The quantum of solid waste is ever increasing due to increase in population, developmental activities, changes in life style, and socio-economic conditions, Plastics waste is a significant portion of the total Municipal Solid Waste (MSW)

The plastic waste material to be segregated to prepare for the utilization as per the type of plastic waste. (the recyclable plastic and non-recyclable plastic) the techniques can be applied mostly for non-recyclable plastic to products (Trash to Cash)

Plastic waste can be converted to handicrafts and many useful products like paving blocks, bricks and pots etc.

Plastic Waste Management & Utilization Models



Plastic Waste to Products – Trash to Cash

LOW CARBON & CLIMATE FRIENDLY INTERVENTIONS FOR URBAN MANAGEMENT

Integrated Solid Waste Management & Organic Urban Farming



PLASTIC WASTE TO PLANTER BAGS FOR ORGANIC FARMING



ORGANIC FARMING BY RECOVERY OF ALL ORGANIC & PLASTIC WASTE

***Community Participation, Livelihood initiatives & Sustainable
Eco-Restoration in a Slum at Kolkata Municipal Corporation Ward No.58***

***Zero organic Waste, Zero Plastic Waste and Minimal Land fill – Transformation
of a Slum to an eco-friendly neighborhood***

**Project Initiated by British Deputy High Commission, Kolkata Municipal
Corporation (KMC) & UK- aid under UK- KMC Low Carbon Resilient Kolkata.**

Project Implementation Partners – PriceWaterhouseCoopers (PwC)

Project Concept Partners - Symbio Greentech Pvt.Ltd.

LOW-CARBON & CLIMATE RESILIENCE IN URBAN DEVELOPMENT THROUGH SUSTAINABLE ENVIRONMENT MANAGEMENT



Sustainable Green Interventions to transform a slum to a model Climate resilient neighborhood



Dhapa Municipal Solid Waste (MSW) Dumpsite Green Capping, leachate Contamination Control & plantation development Restoration through bioengineering techniques Project under UK- aid under UK- KMC Low Carbon Resilient Kolkata by British Deputy High Commission, Kolkata Municipal Corporation (KMC)

PROJECT CONSULTANTS

PricewaterhouseCoopers (PwC), Kolkata.

Consultant - Biotechnology & Environmental Sustainability

- Consulting Services for Climate friendly Interventions, Policies, capacity building and Sustainability Governance Under UK- KMC MoU on Low carbon & Climate Resilient Kolkata supported by Department of International Development (DFID), British Deputy High Commission, Kolkata & UK aid.

<http://www.kmcclimate.org/assets/doc/Roadmap.pdf>

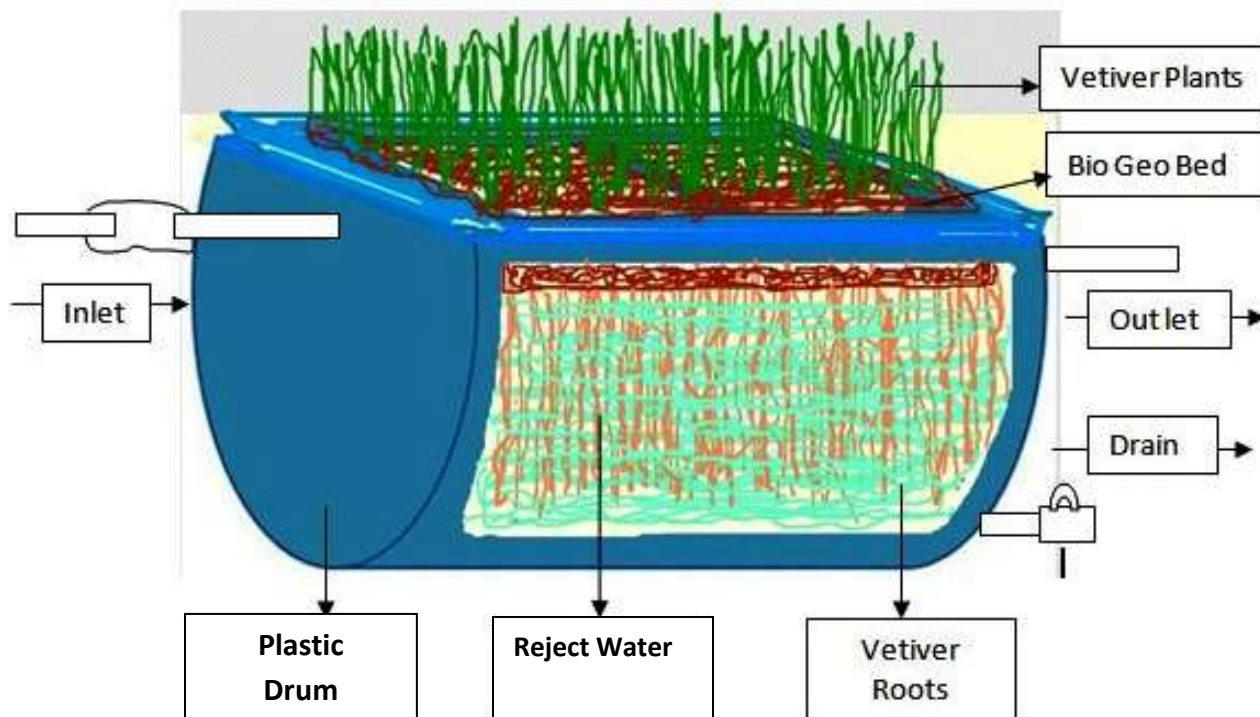
Symbio Greentech Pvt.Ltd. associated with PwC to support the Road Map for Low Carbon Climate Resilient Kolkata Policy and Guidelines for the Promotion of Climate-smart Built Environment in Kolkata and I have written the Green Economy and Climate friendly interventions in the policy in below areas through PwC.

- Strategy and Guidelines for Climate-smart City development in Kolkata
- City Business Plan for the Promotion of a Green Economy
- Green technological interventions for health & Sanitation
- MSW Dump site Restoration and Green capping
- Community Participation & Green jobs
- Urban Eco- Restoration of Contaminated Canals & Water bodies
- Vertical Garden - Heat island effect control
- Eco friendly Water, Sanitation & hygiene management
- Climate-friendly Ward Action Plans for Slum Developments
- Recommendations for Climate-smart Land Use and Urban Farming
 - Disaster Risk Reduction
- Citizen Interface Plan
- Urban Land use
- City Investment Plan
- Green Livelihood

The Road Map has been prepared in alignment with international and national development frameworks, climate protocols, policies and programmes summarises various multi- dimensional, multi-sectorial and cross-cutting interventions/ actions with numerous co-benefits that will be required over different time periods to deliver a cohesive approach to make a climate-smart city

The road map emphasize the city to maintain buoyant economic growth, while embracing greener options for urban development and municipal service delivery, promotion sustainable and innovative urban practices, incorporating whenever appropriate, climate change 'best practice' from other Indian and international cities.

REJECT WATER / GREY WATER RECOVERY SYSTEM



Reject Water Recovery through Bio-Phytoponic System

The Bio-Phytoponic System can be used for pre-treatment of Pond water, contaminated water, Grey water, Arsenic content water, RO, reject from CETP etc.

The techniques based on Bio-engineering by high efficient Beneficial Microbial consortium (isolated from Natural Sources) for natural degradation of organic and inorganic components, Natural fibers, Biomass and sustainable highly sustainable Plants for absorption of heavy metals and other inorganic pollutants. The Plants species are perennial high rapid growth and has the unique ability to thrive in high saline, High TDS , contaminated Chemical & organic load Reject water and has low gestation period for treated with Bio-Phytoponic techniques.

The Bio-Phytoponic system works on eco-friendly Bio-engineering technological intervention with recovery of 50-60 % of RO Reject / grey water by less energy, less space and natural greening of the Installation area with high Carbon sequestration and emission reduction.

Symbio Greentech Pvt. Ltd. has developed an innovative Bio-Phytoponic system for RO reject recovery and reuse. The existing system although has high recovery rate is very energy intensive and adopts complex procedures to recover water from the condensate.

Application Area :

Industrial and Domestic Reject water discharge area

Alternative solution for Reject Water Evaporation system to maintain Zero Liquid Discharge (ZLD)

Urban & Rural Grey Water Recovery & effective utilization

Arsenic & Chemical contamination pre-filter system



SYMBIO GREENTECH Pvt. Ltd.

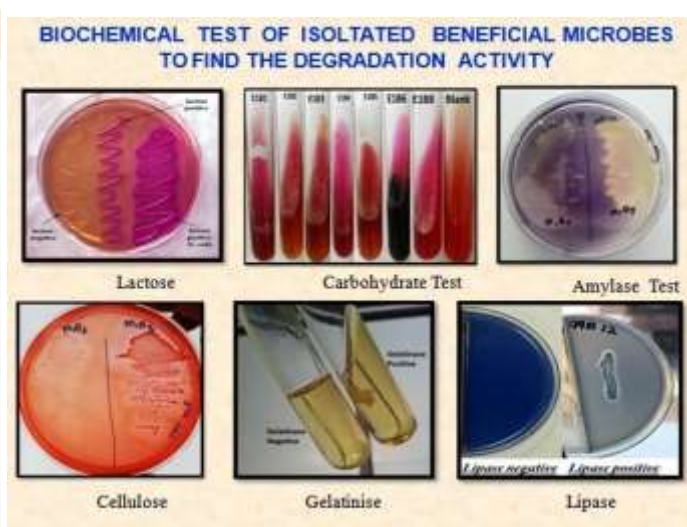
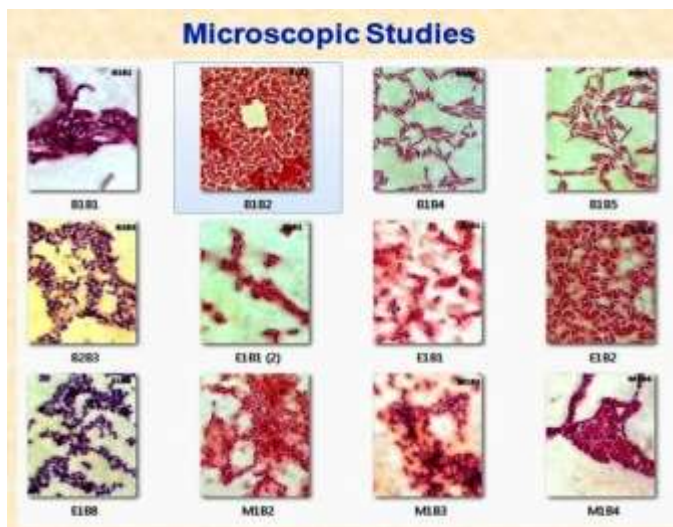
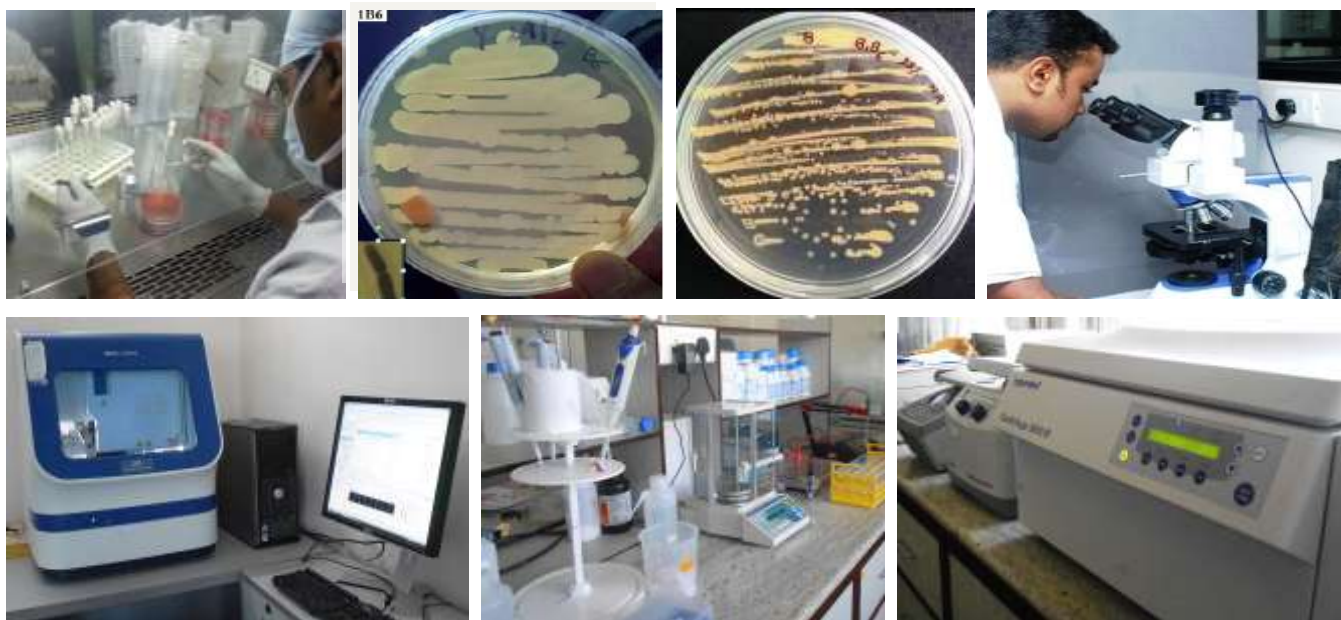
"Sustainability through Bioinnovation"

Technology & Product Development

SYMBIO GREENTECH PVT. LTD. is developing technology and production of Beneficial Microbes (BM) and Bioenergy crops for Environment Protection and Restorations applications.

Our Microbiology lab at EKTA Incubation Centre focusing on production of **Beneficial Microbes (BM)** for the application of environment management in the area of Water body, canal cleaning, Solid Waste Management, Slope Restoration, Degraded land and Fly Ash dump site & Mining area reclamation.

SYMBIO - BENEFICIAL MICROBES (BM) R&D AND PRODUCTION LAB



**SYMBIO GREENTECH Pvt.Ltd. - Microbiology Lab at EKTA INCUBATION CENTRE
West Bengal University of Technology (WBUT) Supported by Department of Science
and Supported by Department of Science and Technology (DST) Govt. of India**

SYMBIO GREENTECH Pvt. Ltd.

“Sustainability through Bioinnovation”

KEY OPERATIONAL AREAS

- ❑ TECHNOLOGY DEVELOPMENT
- ❑ MATERIAL RESOURCE MANAGEMENT
- ❑ JV PROJECTS
- ❑ CONSULTANCY SERVICES
- ❑ CSR PROJECT MANAGEMENT - SITE STUDIES, SITE SPECIFIC DESIGNING, MATERIAL RESOURCES, EXECUTION SUPPORT & EVALUATION

COMMUNITY PARTICIPATION AND GREEN LIVELIHOOD DEVELOPMENTS



Material Preparation Centers for Plants, Jute and Coco fiber, Geo logs & Biomass

- Community Training and technology transfer for larger adaptation and scaling up
- Job creation through community development – Self Help Groups (SHG)
- Bioenergy crops for rural energy for carbon neutral cooking fuel and carbon emission reduction

All the Environmental Restoration Materials produced and site installation through Local communities

CLIENTS

ADITYA BIRLA Group – BIRLA GRASIM

Jaya Shree Textiles – Aditya Birla Jan Seva Trust (ABJST)
Rishra, West Bengal

PRICEWATERHOUSECOOPERS (PwC)

Environmental Sustainability Division, Kolkata

HOWRAH MUNICIPAL CORPORATION

Howrah, West Bengal.

GLOSTER Ltd.

Jute Mill & Geotextiles Manufacturer
Bauria, Howrah Dist. West Bengal

NATIONAL THERMAL POWER CORPORATION (NTPC)

Dadri, Uttar Pradesh.

BAKRESWAR THERMAL POWER PLANT

West Bengal Power Development Corporation Ltd. (WBPDCCL)
Govt. of West Bengal, Bakreswar

INTERNATIONAL COUNCIL FOR LOCAL ENVIRONMENT INITIATIVES (ICLEI)

South Asia HQ , New Delhi

ICT GREEN

Nagpur

TAKE WING GREEN

Chennai, Tamil Nadu

KUTCH CROP SERVICES Ltd.

Mundra, Kutch, Gujarat

NEBULA AGROTECH

Jamnagar, Gujarat

COLLABORATIONS & JV PARTNERS

BIOSFERA FOUNDATION

Gouden Boayum 13c, 8621CV Heeg,
The Netherlands

www.biosfera.repair/en/

- The BIOSFERA Foundation is geared towards developing a sustainable bio based, circular and creative economy, industry and society
- Indian Partner & Project Associate - Bamboo Bio Based (BBB), Agro-Industrial Metabolism (AIM), Circular City - Cidade Circular (CC) Sustainable environment Management.

Globe Water AB

Stockholm, Sweden

- Technology Collaboration in Contaminated Site management, Water treatment solutions, urban Storm Water Harvesting etc..

The Bengal Chamber of Commerce & Industry (BCC&I)

Royal Exchange Place, Kolkata, West Bengal.

- Environment Management & JV Projects

PROJECT CONSULTANTS

PricewaterhouseCoopers (PwC), Kolkata.

Consultant - Biotechnology & Environmental Sustainability

- Consulting Services for Climate friendly Interventions, Policies, capacity building and Sustainability Governance Under UK- KMC MoU on Low carbon & Climate Resilient Kolkata supported by Department of International Development (DFID), British Deputy High Commission, Kolkata & UK aid.

<http://www.kmcclimate.org/assets/doc/Roadmap.pdf>

Technical Consultant - International Council for Local Environment Initiatives (ICLEI)

(ICLEI - Local Government for Sustainability)

Initiatives & Innovation of Climate Change Adaptation & Mitigation in Urban India

(<http://seas.iclei.org/>)

- Environmental Restoration projects in Adopt Integrated Urban Water Management (Adopt IUWM)

Supporting Organizations

Bengal Chamber Of Commerce & Industry (BCC&I)

Energy & Environment Committee
Royal Exchange, Kolkata – 700 001, West Bengal

Administrative Training Institute (ATI)

Urban Management Centre (UMC)
Govt. of West Bengal
FC Block, Salt Lake , Sector III, Kolkata – 700 106, West Bengal

Biotech Consortium India Ltd. (BCIL)

Govt. of India, Aruvrat Bhavan, New Delhi

India Vetiver Network (INVN)

Malappuram Dist
Kerala, South India

Address for communication

SYMBIO **GREENTECH Pvt.Ltd.**

EKTA Incubation Centre

Maulana Abul Kalam Azad University of Technology (MAKAUT)

Formerly West Bengal University of Technology (WBUT)

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