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Green Pages

Newsletter of Meghalaya Institute of Natural Resources

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Umsohjani Spring, Ri-Bhoi



Wah Khah Spring, West Jaintia Hills



Umpohliew Myrta Spring, East Khasi Hills



About MINR

The Meghalaya Institute of Natural Resource (MINR) is one of the three Institutes established under the overall umbrella of MBDA. The Institute's main objective is to manage and strengthen knowledge for natural resource management and sustainable livelihoods.

The Institute provides the knowledge services through the Centre for Bio-Resources, Centre for Water Resources, Centre for Land Resources, Centre for Climate Change and Centre for Real Time Monitoring of Weather.

Vision

Enriching and empowering all the stakeholders with Clean And Green Technologies.

From the Editor's Desk

Biodiversity richness of the State offers possibilities of diverse livelihood to the people. Many species of bamboos, tree species of economic value, medicinal plants, orchids, wild flowers, local fruits, wild varieties of rice, fishes, local vegetables, silk worms and their host species and many others are the rich genetic resource base which if optimally and sustainably utilised, has potential to unleash economic transformation in the State benefiting large number of rural people. Traditional knowledge of the people in utilizing the biodiversity resources is itself a valuable resource. Blending of traditional knowledge with appropriate technologies can go a long way in expanding economy by utilization of the biological diversity in small enterprises. While ensuring market linkage to different products, adequate attention would be necessary for sustainable utilization of the resources. Scientific methods for determining sustainable yield, closer monitoring of health and vitality of the bio-resources and eco-system approach to management of natural resources are essential elements of such initiatives. IBDLP in the last few years has progressed on the above premise. The steady progress under different missions of the programme has on one hand shown initial successes, whereas, on the other, there are challenges to be overcome.

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Wah Umrit Spring, East Khasi Hills



Wah langsabok Spring, East Khasi Hills

Building a Green Economy in Meghalaya.

Green Economy improves human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. This is explained by UNEP as, growth in income and employment driven by public and private investments with reduced carbon emissions, enhanced energy, resource efficiency and preventing the loss of biodiversity. This development path should maintain, enhance and where necessary, rebuild natural capital as a critical economic asset and source of public benefits, especially for poor people whose livelihoods and security depend strongly on nature.

In the last 5 years, India has been increasingly recognised as one of the top performing clean energy economies in the world. National institutions for safeguarding ecological resources against unsustainable development - such as the National Green Tribunal - have been commended; the country's citizen-led environmental movements have long been held up worldwide as good examples of citizen engagement in environmental issues.

Meghalaya and other North-Eastern states are in a unique position to become key actors in a Green Economy focused India. They are rich in biodiversity, has a vast untapped reserves of natural resources, are at low levels of traditional industrial and extractive development and have unique community-centred institutions for land and natural resource governance.

The Government of Meghalaya understanding the need for a bottoms-up participation and innovation in the Green Sector, launched the "Integrated Basin Development and Livelihood Promotion Programme (IBDLP)" in 2012. The programme serves as an institutional platform to converge government policies across multiple departments and initiate systematic partnerships between government line departments, rural and urban citizens, national and international research organisations, programme implementation authorities and other stakeholders. The core focus of the IBDLP is natural resource focused livelihoods and state-wide convergence toward the goals of environmentally sustainable and socially equitable development. This makes the Government of Meghalaya - via IBDLP - a natural voice in the discussion on building and strengthening a Green Economy collectively across the North-Eastern states of India.

Green Economy in Meghalaya has been conceptualized to empower citizens as development partners and entrepreneurs. The goal is to promote individuals and community-based innovations with focus on natural resource conservation, scale up farm-based enterprises and growth in green jobs. A recent key institutional innovation is the Enterprise Facilitation Centre (EFC) set up in every block for supporting entrepreneurship development around natural resources and agri-livelihoods. These centres serve as a single window agencies that along with partner institutions endeavour to link community members to skill development, enterprise incubation, financial assistance, supply chain linkage schemes under various government departments and market access. By establishing this connection to individual citizen-entrepreneurs, IBDLP aims to maximise the outreach and impact of both state and private sector interventions in the future.

While the institutional foundations are slowly being strengthened, much remains to be done in on-ground implementation of sustainable natural resource development activities. Meghalaya is rich in natural resources, which combined with its climate offers tremendous potential to produce a wide variety of fruits, flowers, medicinal and aromatic plants, and a thriving agriculture and livestock sector. Due to its proverbially high rainfall, Meghalaya is endowed with a large number of perennial rivers, lakes, streams, springs, and ground water. The State also

represents a unique and rich repository of biodiversity, with 77% of the state area being underforest cover. Despite this natural abundance, almost half the state's population lives below poverty line (BPL); the state has the fourth largest BPL population of all North Eastern states. This despite the rich natural resources but the asset base of the state remains largely untapped. Less than 49% of the cultivable land is presently sown, and much of it is only used for low intensity and mono crop agriculture. Forests and grasslands are the single largest land use in the State but most are not systematically managed. Plantations and orchards are growing in number, but the area under well managed horticulture and agriculture remains small. There is a large scale potential for organic farming in the State which needs to be effectively tapped. Small-scale irrigation, spring rejuvenation, crop diversification (and intensification), livestock development, as well as greater use of mechanized farming inputs are all being gradually implemented across the State, but there is a long way to go. Feedback from farmers and community-entrepreneurs confirms that these interventions are welcome steps, but many more partnerships and investors have to be a part of the process.

Understanding the need for participation from all stakeholders in the State, this entrepreneurial model of growth and development to focus intensively on creating an enabling environment is expected to foster a sense of ownership around natural resource conservation initiatives and lead to innovations in the livelihoods space, creating a demand driven development programme that will remain successful in the long run and further strengthen green economy in the State.

- MINR TEAM, MBDA.

Impacts of Climate Change and Adaptation to It : Perception and Traditional Knowledge of the People in Rural Areas of Meghalaya.

Climate change is one of the biggest challenges faced by the world today and it has a significant impact on natural environment as well as on human life in terms of economy and well-being of the people. The serious consequences and projections of its impact in future call for adaptation measures from a broad spectrum of policy response and strategies involving various sectors of the economy and governance.

Meghalaya with its unique physiographic setting and bio-geographical characteristics harbours diverse biota with a high level of endemism. The State is rich in terms of natural resources as well as bio-diversity. The economy of the State is closely tied to its natural resource base and majority of the population derive their livelihood from natural resources. However, the State faces a major threat from climate change. Crucial sectors such as agriculture, livestock, water resources, forest, health, sanitation etc are vulnerable to climate change. The impacts of climate change are already being noticed on water springs, agriculture, horticulture, fisheries, livestock etc, and they are likely to aggravate in the near future given the projected climate change scenarios. It will adversely impact livelihood in villages in a significant manner. The vulnerable population of the State is not well equipped to cope effectively with the adversities of climate change due to low capabilities, lack of knowledge, weak institutional mechanisms, limited livelihood options and lack of access to adequate resources.

Meghalaya Climate Change Centre (MCCC) under MBDA has initiated a study on 'Impacts of Climate Change and Adaptation to It : Perception and Traditional Knowledge of the People in

Rural Areas of Meghalaya'. The study is based on the State wide survey, wherein meetings with the villagers are being held for creating awareness in them and gather information about their perceptions of impacts of climate change and their traditional knowledge in coping with the emerging problems due to climate change. Structured questionnaire, interviews and focussed group discussion (FGD) are used to obtain information covering different sectors viz. agriculture, livestock, forest, water, energy and health. The study is targeted to cover all the 39 Blocks under 11 districts of Meghalaya. So far, 28 villages from 7 Blocks in 6 districts have been covered.

Over the years, rural population in Meghalaya, particularly the farmers have experienced climate change through the variability of temperature and rainfall pattern, shift in the season etc. Accordingly, they have also developed and devised few adaptation strategies to combat the impact of climate change with the locally available resources and knowledge. Some of the preliminary findings from the study are highlighted as follows.

Majority of the farmers have experienced increasing trend in the temperature over the years, while the rainfall pattern has become more erratic in nature. They also expressed that the frequency of extreme events such as storm, flash flood and frost have increased in the last two decades. In addition, reduction in the water discharge from springs, deterioration in the quality of water have also been observed by many villagers.

A declining trend in the crop productivity as well increasing instances of crop diseases and pest attack have been observed by the farmers. Some of the farmers have also noticed reduction in the size of fruits and incidence of new diseases have also been recorded. Accordingly, the farmers have taken several initiatives and measures to adapt to the impact of climate change. Adaptive measures include crop diversification, planting different crop varieties, soil treatment etc.

Some of the traditional systems practiced by the villagers toward adaptation have been identified and documented. The farmers use plant phenology and animal behaviour as an indicator for predicting the weather. Indicators like flowering of mangoes indicate the onset of monsoon seasons, croaking of frogs indicate arrival of summer season, the appearance of termites indicate the blooming/fruited of plants. Accordingly, shifting of sowing and harvesting time has been initiated by few farmers. In addition, diversification of livelihood like complementing farm activities with non-farm activities, rearing of livestock, aquaculture, apiculture and horticulture is also seen as the trend to balance out losses and diminishing returns from the agriculture as a result of climate change.

The study is intended to understand the rural peoples' perceptions who are dependent on primary activities, to cope and adapt to climate change. The impact of climate change cannot be understood and responded without understanding reality on the ground. It is believed that the findings of this study would provide baseline information for better planning and implementation of projects aimed at enhancing climate resilience and adaptation.

- Climate Change Team, MBDA.



Green Initiatives

HYDROGER

Meghalaya has a huge potential in hydro-power generation approximately about 3000 MW which is about 3 per cent of the total hydro potential of the country. Power being harnessed so far is only 185 MW against the requirement of 610 MW.

Meghalaya Institute of Natural Resource (MINR) under MBDA in collaboration with Nagaland Empowerment of People through Energy Development (NEPED) in its efforts to tap the Hydro potential energy introduced "Hydroger" (derived from the word 'Hydro' and 'Generator').

Hydroger is used for hydro electrical power generation of under 10kW. It comprises of cylindrical cast iron housing and alternator which is connected to the turbine through the shaft. Hydro Power is used to turn the turbine to generate energy.

The energy (Electrical power) produced from the Hydroger can be used for a variety of domestic uses and also small scale processing units like juicing, husking, drying of Agro produce etc.

A pilot project was successfully completed in Mawlyngbna. A Hydroger generating approximately 1 kW of power was installed. With 1 kW of power 200 LED bulbs (5W) can be lit, this is sufficient for about 50 household.

SPRING-SHED DEVELOPMENT

The Ministry of Environment, Forest and Climate Change held the ninth meeting of the National Steering Committee on Climate Change (NSCCC) on the 22nd Feb 2016. The Committee approved the Detailed Project Reports (DPRs) on adaptation submitted by the Governments of Meghalaya for funding, under the National Adaptation Fund on Climate Change (NAFCC).

The project is titled 'Project for Rejuvenation and Climate Profing of Spring-shed for Livelihood, Water and Food Security in Meghalaya' at a total cost Rs. 23.98 crores for four years

The project seeks to maintain and improve the integrity of the natural water bodies. The project interventions will help in reducing the surface runoff of rainwater in the spring-shed areas, promote deeper water percolation, and rejuvenate the water springs. The project is expected to benefit approximately 16, 494 households.

ORGANIC MISSION

Organic farming is a system which avoids or largely excludes the use of synthetic inputs, such as inorganic fertilisers, pesticides, feed additives, etc and to the maximum extent feasible, relies upon crop rotation, mixed cropping, recycling of crop residues and off-farm organic waste.

Organic fruits, vegetables, and grains have several measureable nutritional benefits over conventional crops, one such benefit is a higher concentration (18 - 69 %) of antioxidants. Organic food are free from pollutants and harmful chemicals.

Since farming in Meghalaya is basically organic by practice, therefore there is ample scope for expanding and exploiting the market potential of this sector. The Meghalaya Mission Organic emphasizes on the need to build the entrepreneurial capacity of the farmers towards achieving business acumen in the process of organic production and marketing. Organic Certification programme associated with this Mission will help link our Organic Products with Organic Markets at National and International level. Mission Organic also aims to generate multiple livelihood opportunities and employment avenues through various services and interventions in the State and rural communities in particular.

CENTRE FOR LAND RESOURCES

The centre for Land Resources is established as a key resource institute on matters relating to Land. The Centre will play a key role in helping bridge the gap existing between knowledge and dissemination.

Anthropogenic activities damaging the landscapes, threat from climate change, nutrient loss, pollution of land resources, unsustainable development practices, exploitation of resources, etc are only a few of the numerous stresses on land resources which Meghalaya faces today. While the problems are complex the solutions need to be holistic. To better understand the problems and successfully navigate the nuances, the Centre for Land Resources has been envisioned.

The major role of the centre is to establish a comprehensive Land Use Data. This information is required to know the status of land use in the State and to identify the land use changes from year to year. This knowledge will help develop strategies to balance conservation, conflicting uses, and developmental pressures. Issues driving land use studies include the removal or disturbance of productive land, urban encroachment and depletion of forests.



3Kw Reaction Hydroger



Spring Mapping at East Khasi Hills



Organic Produce

Wastelands Atlas of India 2005-06 published by the Dept. of Land Resources, Govt. of India, shows that Meghalaya has 17.24% wasteland of the total geographical area.

Moving towards a Greener Meghalaya



19th-20th Feb 2016 – Workshop on Application and Uses of Hydro-Geomorphological Maps (HGMs) for Groundwater perceptions conducted by India Water Foundation, Ministry of Drinking Water & Sanitation, Govt of India, for MBDA officials and all water sector related Departments of the State. The maps depict prospective zones for ground water occurrence and can be used for locating drinking water supply bore wells as well as locating of appropriate ground water recharging structures such as check dams, sub-surface dyes etc.



12th-22nd Jan 2016 :
Mapping of springs in Ri-Bhoi district-
 Detailed inventories of about 89 number of springs has been conducted in Ri-Bhoi District. The undertaking of an extensive springs mapping survey is to provide a better knowledge and understanding of the basic characteristics of the springs, study their conditions and then use action research to explore whether the drying springs can be revived through a springshed development approach using geohydrological techniques. Spring Mapping is being carried out in all the other districts of the State as well. A total of 1200 number of springs has been mapped so far.



20th Jan 2016 – Meeting with the Sordar and Headman of the villages under the Umtyngar Catchment Area, at Mawjrong. The objective of the meeting is to sensitize the traditional heads on the importance of protecting the catchment areas as well as the springs located in the area. Introduction of the concept of community nurseries as part of greening the spring shed and the livelihood opportunities that comes with surplus water were also highlighted.

28th Jan 2016 & 12th Jan 2016 -
 Sensitisation Program on Spring's Protection Initiatives at Nongstoin, West Khasi Hills & Tura, West Garo Hills respectively. This is part of the ongoing Sensitisation programme carried out in all the districts of the State. The objective of the program is to create awareness and build capacity of the Basin Development Units, Water sector related departments, community leaders and volunteers on springs Protection initiatives. Emphasis was made on the importance of community participation for achieving sustainable livelihood with assured irrigation, power supply through springs rejuvenation works that maintain the base flow of streams and rivers.



5th feb 2016 - A team from Nagaland Empowerment of People through Energy Development (NEPED), BDU West Khasi Hills, Water Resources and MINR visited Mawphanlur to study the feasibility of the village for installation of Hydroger and Hydram to solve the problem of shortage of drinking water and water for irrigation in the Village. Kshaid Photbah was identified as the suitable site.



Moving towards a Greener Meghalaya



26th Feb 2016: National Science Day -

The celebration, jointly organized by SCSTE, Shillong Science Centre, NEHU, MBDA and North Eastern Council on the theme "Science for Development". Students selected from the 39 C&RD Blocks participated in various competition and activities aimed at creating scientific awareness, including science exhibition, theme-based wall painting competition, display of technologies, night sky viewing, science film shows, science talk and interactions, marathon run and placard rally. The Hon'ble Chief Minister of Meghalaya, Dr. Mukul Sangma was the Chief Guest of the celebration.



22nd April 2016 : Earth Day Celebration-

River Umshing is the only source of drinking water for the 11 localities of Mawlai under the Greater Mawlai Water Works of the PHE Department. With the passage of time, this source has been subjugated to a lot of pressure mainly due to space constrains and the extensive degradation caused by mankind which has made it unfit for human consumption. Seeing the urgent need to sensitize the local people on the importance of preserving this natural source. The Meghalaya Institute of Natural Resources in collaboration with the Young Indians, Meghalaya Chapter, organized a cleaning drive of Umshing River to observe Earth Day 2016.



14th - 19th March 2016 - The

Meghalaya Institute of Natural Resources (MINR) in collaboration with Arghyam, PSI, Keystone, Himmothann conducted "The Training Of Trainers (TOT) on Springshed Management". The training was jointly organised by The State Institute Of Rural Development(SIRD) and MINR.

The objective of the training is to build understanding and capacity of district Government staff, Water sector related departments, community leaders, NGOs and Volunteers from the 11 districts of the State on characteristics of Springs, ways to revive them and the indept understanding of Hydrogeology which is the basis of spring management . Thus creating parahydrologistat at the village level, demystifying Hydrogeology of Springs.



28th-29th April 2016 : A team from Nagaland Empowerment of People through Energy Development (NEPED), BDU West Khasi Hills, Water Resources, GIZ and MINR visited West Khasi Hills District to identify suitable sites for installation of Hydroger and Hydram . This would serve as a pilot project showcasing the Green Energy Technology. Two potential sites in the district identified were at Umjei, Mawthadraishan Block and at Photkynthei, Nongstoin Block.



8th-9th April 2016 - The team from MINR and GIS

Team visited Nonriat Village , which is famous for the double decker living root bridge, for an extensive field study of the area along with GPS mapping of the entire area. This is for developing signages in order to provide tourists with information and easy access to places of tourists interest in and around the village including trekking routes, bridges and waterfalls . The field study was conducted for a comprehensive knowledge of the village for designing various intervention plans .



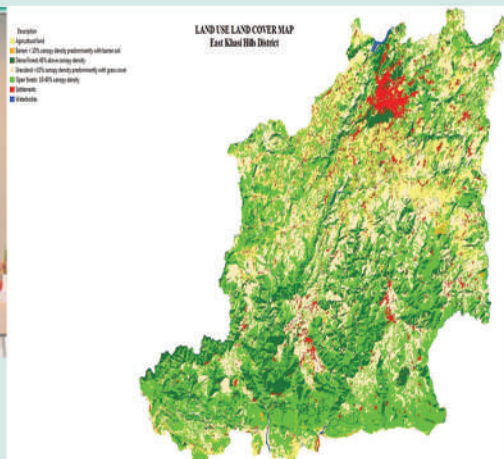
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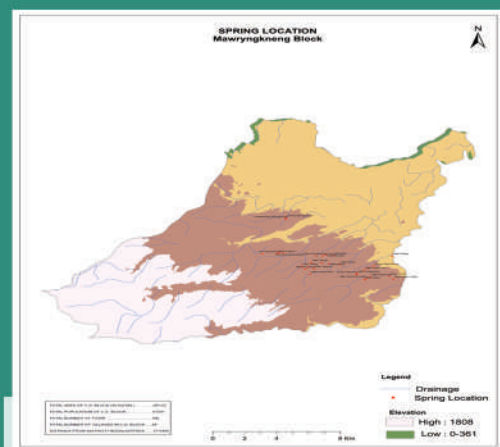
Community Nursery at Pynter (CLF), of the latehsong SHG.



Workshop on 'Adaptation to Climate Change in Meghalaya' held on 14th April, 2016, Shillong. The workshop aimed at sensitising the stakeholders of various departments about climate change, knowledge sharing and also apprising them about the opportunities available under National Adaptation Fund for Climate Change (NAFCC). Shri P. Tynsong Hon'ble Minister, Forest & Environment, Meghalaya, inaugurated the workshop.



Map showing Land Use Land Cover (LULC) of EKH District. LULC is an important component in understanding the interactions of the human activities with the environment. The LULC maps of the districts are being prepared by GIS Team, MBDA with the focus on planning catchment area afforestation.



Map showing location of springs mapped in the Mawryngkneng Block.



Interaction with villagers at Selsella Block to ascertain the impacts of climate change and adaptation - perception and traditional knowledge of the people in rural areas of Meghalaya.



Water Quality Testing using a Water Tracer. Water temperature, Salinity, PH, TDS and Alkalinity are the parameters tested.



MINR represented Meghalaya at the Session on UNESCO World Heritage Sites in North Eastern India at Tezpur, Assam, organised by the Wildlife Institute of India on the 14th of May 2016.



Consultative Workshop on Community NRM Projects, held at Tura, on the 4th of March, 2016. The main objective of the workshop was to interact and share knowledge with different stakeholders in Garo Hills with respect to community led natural resource management projects and activities with thrust on livelihood promotion by convergence amongst the allied departments.



Calculating the Strike and Dip of a rock using a Clinometer and a Brunton Compass. This is required to identify the recharge area of a spring for rejuvenation.