Vol.3
January 2014

In Conversation with People of Meghalaya

Natural Resource Management

IBDLP

IBDLP MEGHALAYA

Contents

Foreword

Meghalaya is blessed with natural resources which provide the thrust to developmental activity in the state. However the unplanned and unsustainable use of these natural resources may lead to a situation of irreparable damage not only to the environment but also adversely affect the livelihood options of the majority of the population. Hence it is imperative that the consumption of natural resources has to be balanced with their optimum and sustainable use. Therefore a model of development must be practiced which is sustainable and benefits all stakeholders. Recognizing the need for an action plan to achieve this goal of sustainable development, the IBDLP programme has emphasized Natural Resource Management (NRM) as one of the four pillars of the programme and has created the Meghalaya Institute of Natural Resources (MINR) to drive this initiative. With increasing pressure on the use of natural resources, there is an underlying fear of the overuse and depletion. Thus, there is an urgent need to put into place an effective natural resource management plan involving all the stakeholders concerned.

Meghalaya Institute of Natural Resources has shouldered the responsibility to preserve the natural heritage of the State by making stakeholders aware of sustainable practices which could be used to promote livelihood activities in the State. The institute plays a pivotal role in facilitating the development of conservation technologies and management practices, by learning from both traditional and modern knowledge, to improve productivity and profitability while keeping a check on the reserves of natural resources.

The key stakeholders such as departments of the government, the local communities and women form the backbone of this conservation initiative in Meghalaya. Women, in fact, play a pivotal role in decision making process and will propel the water conservation initiatives which fall under the programme. The NRM framework is bound to cultivate a participatory approach and promote gender equality by laying emphasis on empowering the local communities and the women to secure full participation from them.

The MINR seeks to also partner with universities, research institutions, centres of excellence and the local communities to build a strong knowledge network throughout the state to promote NRM. The idea is to enhance the knowledge and skills to shift orientation and perspective of stakeholders at different levels and ensure that NRM perspectives guide policy, from the planning to the implementation stage.

The third issue of 'In Conversation with People of Meghalaya' elaborates on Natural Resource Management (NRM) and features the policy framework and also the initiatives that have been taken up by the MINR to promote efficient management of natural resources in the state. It is hoped that the plan will govern and guide developmental policies and programmes for all the Missions under the IBDLP and that NRM perspective and approach will be incorporated by all stakeholders, especially the local communities so that sustainable development, conservation and optimal use of natural resources will form the basis of development in Meghalaya.

Editorial Team
MBDA

Natural Resource Management (NRM)

Introduction

Natural Resource Management implies systematic and planned utilization of natural resources, namely, land, water, air, flora & fauna for development so as to satisfy the needs of the present generation without compromising the ability of future generations to meet their own needs. NRM calls for promoting multiple livelihoods and enterprise development in the context of increase in productivity, efficient and judicious use of the eco-system to sustain air, water & food security.

From the view of sustainable economic development, the management of natural resources implies that the environmental stocks should not be over exploited as it will have adverse effects not only on the environment but on the livelihood options of the present as well as the future generation. There are certain ecological limits beyond which the exploitation of natural resources would not be 'sustainable'. These limits determine the carrying capacity of the ecosystem or the extent to which the natural resources could be exploited consistent with their sustained availability in the case of renewable resources, in the case of non-renewable resources like minerals etc, their utilisation has to be done judiciously with necessary measures for safeguarding the ecology & environment.

The challenges of development can be met only by reinforcing that the basic needs of the people are met through judicious and sustainable use of natural resources. Conservation that covers a wide range of concerns and activities is the key element for sustainable development. An effective natural resource management strategy would as well address climate change adaptation and mitigation measures.

The primary concern for natural resources management is to ensure community initiatives to reinforce traditional ethos and build a society conscious of conservation for making optimal and efficient use of natural resources guided by modern technology.

Natural resource management solicits integrated approach and participation of all concerned stakeholders, from planning to the implementation. NRM Plan would govern and guide developmental policies and schemes for all the Missions under IBDLP.

Natural Resource Management Guidelines for IBDLP Programme

(a) Equity and Inclusiveness:

NRM Plan would be considered as a lever of inclusiveness for facilitating equity processes such as enhanced livelihood and gainful employment opportunities for the poor through inclusive investment in their assets and improvement in productivity and income. The plan will also ensure improved access of the poor to the benefits.

Women will play vital role in decision making process with representation in institutional arrangement. Their views and perspectives will be incorporated into the planning process and they will be ensured usufruct rights to access common property resources for the poor wherever possible.

(b) Facilitating Agencies:

Professionals with competence having necessary skills and expertise would be required to undertake social mobilization, community organization, building capacities of communities in participatory planning, implementation, management, operation and maintenance of assets created and monitoring and evaluation, which also need intensive facilitation.

(c) Capacity Building and Technology:

Capacity Building is a crucial component for achieving the desired results. This is a continuous process enabling functionaries and stakeholders at different levels to enhance their Knowledge and Skills and develop correct orientation and perspectives, thereby becoming more effective in performing the tasks and undertaking roles and responsibilities. With current trends and advances in Information Technology and remote sensing, it is possible to acquire detailed information about the various field level characteristics of any area or region. Thus, the endeavour would be to build in strong technology inputs into the vision of NRM Plan.

(d) Monitoring, Evaluation and Learning:

A participatory outcome, impact- oriented and user — focused monitoring, evaluation and learning system is another area emphasised in NRM plan to obtain feedback and undertake improvement in planning, designing, implementation etc.

(e) Organizational Restructuring:

NRM Plan envisages establishing appropriate technical and professional support system at different levels. Thus, developing effective functional partnership with concerned line departments and other strategic partners from within and outside the country would play a vital role.

Natural Resource Management solicits comprehensive approach to improve livelihoods apart from promoting water, air, and food & nutritional security. This calls for active and effective participation of the concerned stakeholders, synergy and convergence of all line departments and active and voluntary participation of the ground level stakeholders. The NRM Plan envisages promoting a minimum of three livelihoods, as also a paradigm shift from beneficiary orientation to entrepreneurship promotion.

Focus Areas for Natural Resources as Identified by MBDA

Land and Water

The importance that water is a finite, though renewable resource, has to be clearly recognized. Water and land are to be considered together and holistically, particularly in the context of utilization for sustainable development. Water conservation measures, judicious use of water, economising the consumption of water in households, agriculture, etc. and prioritizing the uses of water reducing wastage and pollution would be essential.

Atmosphere

For prevention and control of atmospheric pollution including noise pollution, the thrust will be on use of clean fuels and technologies, energy efficient devices and air and noise pollution control systems. It is imperative to lay down source specific, area wise air quality standards and time bound plans to prevent and control pollution.

There should be proper location of projects to minimise adverse impact on people and environment and develop coping mechanisms for future climatic changes as a result of increased emission of carbon dioxide and greenhouse gases. MBDA will also provide incentives for environmentally benign substitutes, technologies and energy conservation.

Biodiversity

Action for conservation will be directed to intensification of surveys and inventory of biological resources including mapping different ecological systems and conservation of biodiversity through a network of protected areas including biosphere reserves, parks, sanctuaries, gene conservation centre, wetlands and such other natural habitats of biodiversity.

For the vast majority of the rural people, the foremost needs are fuel-wood, timber, fodder, fibre, etc. The issue of sustainable resource utilization, therefore, has to be specially addressed, mostly from the point of view of biomass requirements of the rural poor.

Strategy of Implementation

a) Devising ways and means by which local people can conserve and utilize the resources of the common lands and degraded forest land, with a stake in the continuing productivity of the resources

b) Encouraging private individuals and institutions to regenerate and develop their wastelands

c) Raising fuel wood species and provision of alternatives to reduce the dependence on fuel wood

d) Taking measures to increase the production of fodder and forage crops to bridge the wide gap between supply and demand

e) Raising bamboo and other species providing small timber for construction of house, farm implements and other economic activities

f) Enhancing availability of biomass to meet essential requirement of biomass based industry

g) Promoting synergy between forest-based industries and farming for raw materials without diversion of prime agricultural lands and displacement of small and marginal farmers

h) Focused research and development in forestry for better regeneration and improved productivity

i) Development of appropriate technologies for enhancing the productivity and efficient use of all biomass resources

j) Institutional and technological support systems to enable rural artisans to sustain biomass based crafts

k) Curtailment of the supply of subsidised biomass based resources for industrial purposes

Energy Generation and Use

For prevention and control of pollution and environmental hazards in energy generation and also for encouraging popularisation of environmentally friendly energy systems, the following measures should be taken:

a) Environmental impact assessment prior to investment decisions and site selection; choice of practicable clean technologies for energy production and processes including waste utilisation, treatment and disposal of solid wastes, effluents and emissions

b) Location of energy generation projects based on environmental considerations including pollution, displacement of people and loss of biodiversity

c) Incentives and punitive measures (including proper pricing) to prevent abuse and to promote the use of energy efficient devices in the production and distribution systems and for energy conservation in all sectors including households, agriculture, industry, power and transportation

d) Concerted efforts for development and propagation of decentralised green energy solutions

Agriculture

For sustainable management of agriculture, the following actions are suggested :

a) Development of Integrated pest management & integrated nutrient management

b) Development and promotion of methods of sustainable farming, especially organic and natural farming.

c) Efficient and judicious use of inputs including agro-chemicals with minimal degradation on soil health

d) Promotion of integrated farming system and sloping agricultural land technology model

e) Scientific use of land depending on land capability and productivity

f) Evolving cost effective and efficient methods of water conservation and use

g) Incentives for cultivation of high value crops and those with lesser demands on water and energy inputs

h) Encouraging crop rotation patterns

i) Anticipatory programme and contingency plans for coping with disasters such as flood and drought and for climate change

Water

a) Priority to multipurpose small reservoir and storage to harvest and conserve runoff rainwater without causing significant alternation of environmental concerns.

b) Prioritisation of water usage in order of drinking, irrigation, factories, wildlife, industrial, etc.

c) Conservation and management of ground water including regulation of ground water extraction with promotion of ground water recharge

d) Revival of traditional water management system including improvement and modification of the existing irrigations systems like Jalkunds, etc and other forms of harvesting and conservation of run-off rain water, etc.

e) Measures for increasing the efficiency of water use, water conservation and recycling

f) Promotion of community- initiated catchment area treatment and management of drainage areas, protection of vegetation cover and measures to prevent siltation, in an integrated manner

g) Focus on network of small micro- irrigation and water projects with minimum environmental disruption capable for multipurpose uses

h) Promotion of institutions for scientific management of the assets (water, reservoir and distribution system, etc)

i) Community — initiated watershed management and protection would be so designed as to have a direct impact on the life of the reservoir, hydrological regime and life support systems

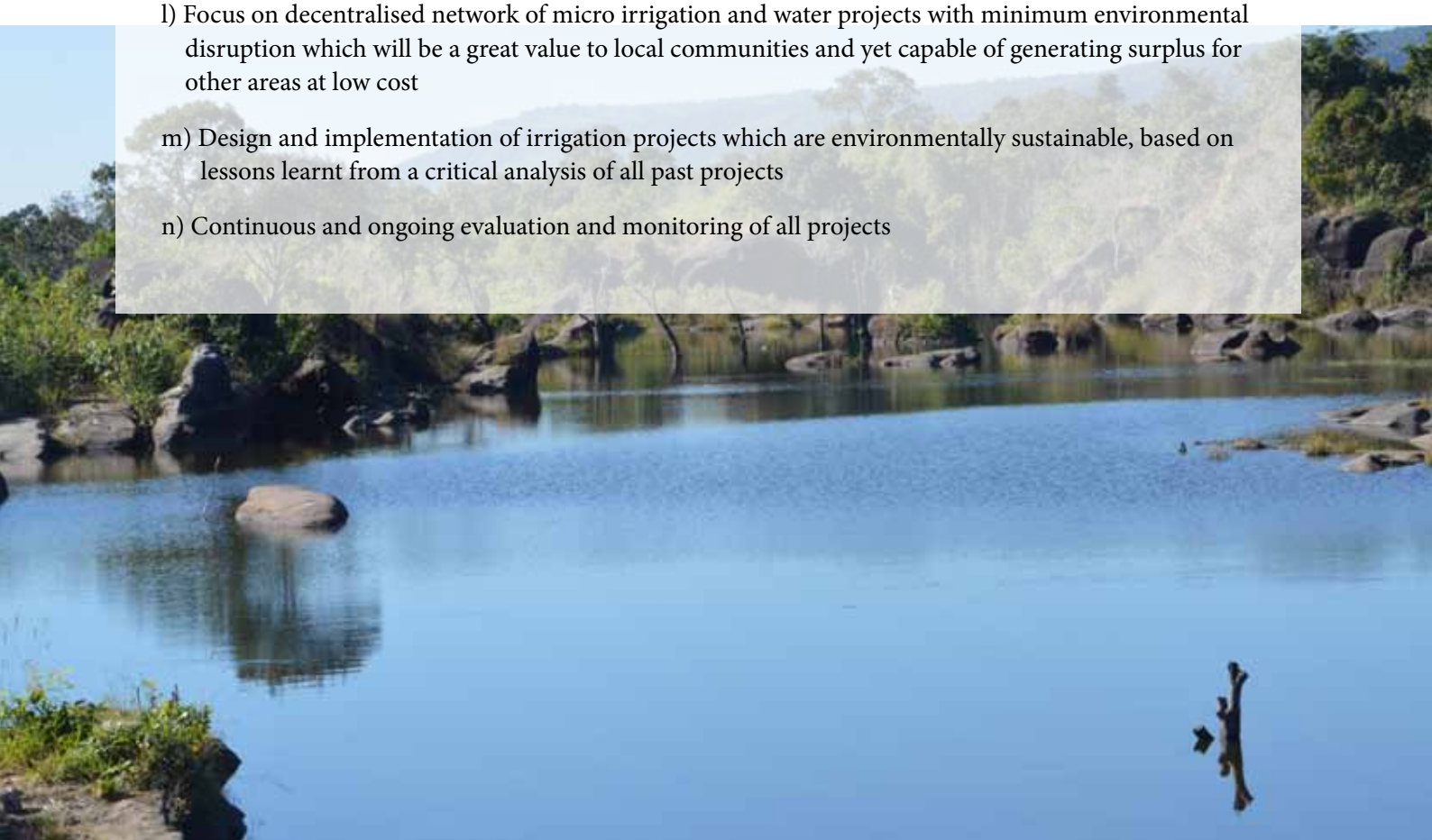
j) Adoption of participatory command area development approach for all irrigation projects to ensure optimal utilisation of Basin recourses while promoting the ecosystems

k) Critical assessment of irrigation projects and delivery systems to ensure optimal utilisation of water resources along with measures to mitigate environmental damage and social conflict

l) Focus on decentralised network of micro irrigation and water projects with minimum environmental disruption which will be a great value to local communities and yet capable of generating surplus for other areas at low cost

m) Design and implementation of irrigation projects which are environmentally sustainable, based on lessons learnt from a critical analysis of all past projects

n) Continuous and ongoing evaluation and monitoring of all projects



Livestock

a) Improvement in genetic variability of indigenous population

b) Selective breeding of animals for draught power to conserve fuel

c) Promotion of stall feeding and rotational grazing

d) Involvement of village community in the policy planning for development of community pasture lands and stall feeding

e) Incentive for growing fodder and forage crops and establishment of community — based fodder banks

Forestry

Concerted efforts will be made for raising forest cover and for conservation of existing forests. For attaining the goal of having at least one-third of our land under very dense or dense forest cover, intensified measures on a mission mode are to be taken along with intensive mobilization of resources for this purpose. In this regard, the actionable points would include the following:

(i) Maintenance of environmental stability through preservation and, where necessary restoration of the ecological balance adversely disturbed by serious depletion of forests

(ii) Conserving the natural heritage by preserving the existing natural forests with diverse flora and fauna, which represent the biological diversity and genetic resources of the State and the country

(iii) Increasing substantially the forest, tree cover involving local people by providing tangible economic benefits and gainful employment opportunities meeting the rights and concessions for requirements of fuel, wood, fodder, minor forest produce, small timber of the rural population within the sustainable development framework

(iv) Increasing the productivity of forests to meet essential and livelihood needs

(v) Afforestation on common lands by the local communities through usufruct sharing. Promotion of village forests for protection of water sources and water bodies apart from ecological and economic benefits will be encouraged

(vi) Motivation of farmers and land owners to resort to tree farming in similar manner with crop- based farming will be encouraged

(vii) Substitution of wood by other materials for alternative sources of energy and fuel efficiency will be done

(viii) Forest-based industrial units promoting unsustainable utilization of forest based raw- materials will be discouraged

(ix) Permission to forest-based enterprises after thorough scrutiny regarding availability of materials will be granted

Rural Energy

(i) Decentralized small projects for meeting rural energy needs like the solar, wind, bio--energy, and micro-hydel projects will be encouraged

(ii) Concerted efforts for development and propagation of green energy solutions

(iii) Setting up bio-energy plants based on cow dung, pig dung, vegetable wastes, etc. will be promoted

(iv) Bio- fuel plantations will be taken up on wastelands of the State

(v) Incentives for use of bio-energy & energy sources like solar, wind, etc

Industries

The action points in this regard should include a mix of promotional and regulatory steps which are as follows:

i) Incentives for environmentally clean technologies, recycling and reuse of wastes and conservation of natural resources

ii) Fiscal incentives to small-scale industries for pollution control and for reduction of wastes

iii) While deciding upon sites, priority to compatible industries so that, to the extent possible, wastes from one could be used as raw material for the other and thus the net pollution load is minimised

iv) Location of industries as per environmental guidelines for setting up of industry

v) Enforcement of pollution control norms in various types of industrial units depending on their production processes, technologies and pollution potential; particular attention to be paid to highly polluting industries

vi) Encouragement for use of environmentally friendly automobiles and motor vehicles; educate people on pollution due to auto-emission

vii) Collective efforts for installation and operation of common effluent treatment facilities in industrial estates and in areas with a cluster of industries

viii) Introduction of 'Environmental Audit' and reports thereof to focus on environment related policies, operations and activities in industrial concerns with specific reference to pollution control and waste management

ix) Dissemination of information of public awareness on environmental safety aspects and stringent measures to ensure safety of workers and general population against hazardous substances and processes

x) Preparation of on-site emergency plans for hazardous industries and off-site emergency plans for districts in which hazardous units are located

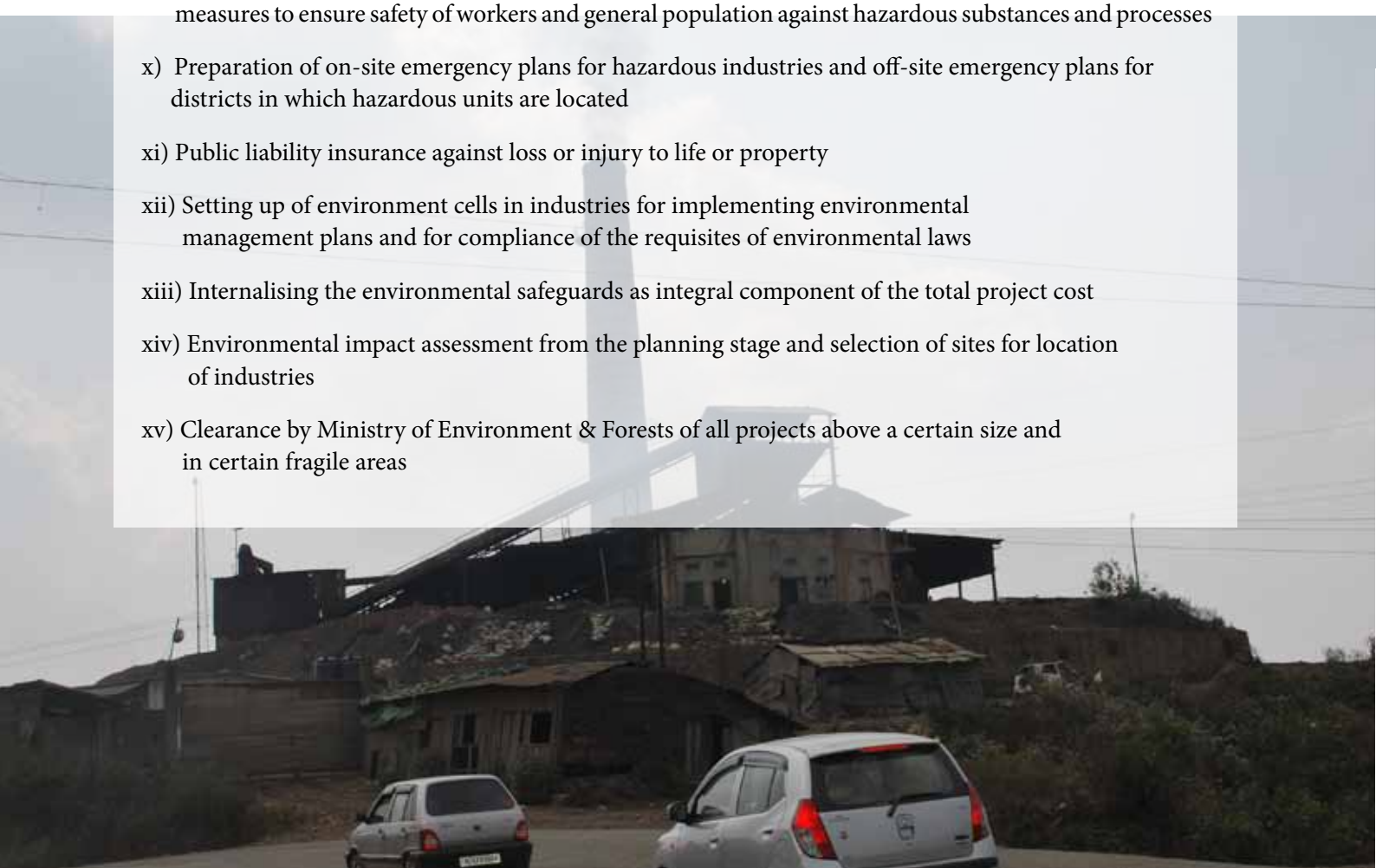
xi) Public liability insurance against loss or injury to life or property

xii) Setting up of environment cells in industries for implementing environmental management plans and for compliance of the requisites of environmental laws

xiii) Internalising the environmental safeguards as integral component of the total project cost

xiv) Environmental impact assessment from the planning stage and selection of sites for location of industries

xv) Clearance by Ministry of Environment & Forests of all projects above a certain size and in certain fragile areas



Mining

To prevent and to mitigate environmental repercussions in mining and quarrying operations, action must be directed to:

i) Mined areas rehabilitation and implementation of the environmental management plans concurrently with the on-going mining operations to ensure adequate ecological restoration of the affected areas

ii) Rehabilitation of the abandoned mined areas in a phased manner so that scarce land resources can be brought back under productive use

iii) Emphasis on production of value added finished products from mining so as to reduce indiscriminate extraction

iv) Up-gradation and beneficiation of minerals at the source, to the extent possible in order to ensure utilisation of low- grade mineral resources and to reduce the cost of transportation, processing and utilisation

v) Environmentally safe disposal of the byproducts of mining

vi) Restriction on mining and quarrying activities in sensitive areas such as hill slopes, areas of natural springs and areas rich in biological diversity

vii) Discouraging selective mining of high grade ores and recovery of associated lower grade ores during mining

viii) Environmental impact assessment prior to selection of sites for mining and quarrying activities

Tourism

To ensure sustainable growth of tourism without causing irreversible damage to the natural environment, activities relating to tourism should take care of the following;

i) Promotion of tourism based on careful assessment of the carrying capacity and support facilities such as transport, fuel, water and sanitation

ii) Development of tourism in harmony with the environmental conditions and without affecting the lifestyles of local people

iii) Restriction on indiscriminate growth of tourism and strict regulation of the tourist activities in ecological sensitive areas

Transportation

For prevention of pollution and for development of environmentally compatible transportation systems, the following steps should be taken:

i) Improvement in mass transport system to reduce increasing consumption of fuel, traffic congestion and pollution

ii) Improved transport system based on bio-energy and other non-polluting energy sources

iii) Improvement in traffic flow through proper maintenance of roads, updated traffic regulation and strict enforcement of prescribed standards

iv) Enforcement of smoke emission standards for containing vehicular exhausts, at the manufacturer and user level

v) Phasing out the use of lead in motor spirit

Human Settlements

To prevent and to mitigate environmental repercussions in mining and quarrying operations, action must be directed to:

To check unplanned growth of human settlements and to ensure a better quality of life for the rural and urban population, the action points should include the following:

i) Creation of gainful employment opportunities and provision for meeting the basic needs through better communications, entertainment, medicinal and educational facilities in rural areas to check rural — urban migration

ii) Decentralisation of urbanisation through establishment of secondary cities and towns with requisite infrastructural services and employment opportunities by developing human settlement perspective plan.

iii) Disincentives for industrial and job location in existing urban centres which have exceeded their carrying capacity

iv) Improvement of infrastructural facilities such as water supply, sewerage, solid waste disposal, energy recovery systems and transportation in an integrated manner

v) Promoting the use of indigenous building materials and appropriate construction technologies by revising building and planning codes supporting small —scale production, skill up-gradation of artisans and people oriented delivery systems

vi) Conservation of heritage sites and buildings, through regulation to ensure that these are not demolished, encroached upon and affected by indiscriminate construction and pollution

vii) Stock — taking of building, areas, monuments of heritage value in the State

viii) Recycling of existing building stock to save green open compounds and save building material

ix) Planting of shade giving and fruit bearing and ornamental trees along the road side, in the compounds of schools, hospitals, Government as well as private office premises, places of worship, places meant for public fairs, assemblies and markets, and the periphery of play grounds and water bodies

x) Botanical gardens representing the local flora

xi) Raising of gardens, parks and open spaces in the towns and cities for public use and for promotion of environmental consciousness

xii) Laying down a system for the propagation and protection of urban forestry by assigning responsibility amongst the various authorities

xiii) Deterrent measures to discourage indiscriminate growth of human settlement and polluting industries in vulnerable and ecologically fragile areas

xiv) Environmental appraisal of projects related to urban development and regional planning, preparation of environmental and eco development plans for sensitive regions and sub-regions for evolving desirable norms and space standards

xv) Prevention of environmental health problems and associated communicable and non- communicable diseases by educating people on personal hygiene, sanitation and use of potable water

xvi) Creation and strengthening of health care localities for all sections of society both in rural and urban areas

xvii) Establishment of monitoring systems and epidemiological data to ensure adequate early warning system for prevention and control of diseases

Support Policies and Systems

Implementation of the NRM Plan will need support policies and systems for filling the gaps in the existing institutional set up, legislative instruments and enforcement mechanisms, research and development, mobilisation of financial resources, creation of public awareness and training of professionals.

Strengthening of Institutions and Legislation

It will require strengthening of existing institutions at different levels. It will need close linkage between the compartmentalised sectors which have been historically dealt with by separate organisations. It will call for a change in the institutional mechanism for enlisting public participation. This will involve quick decision making on development projects based on assessment of their potential of rendering long term sustainable benefits to the society at large, particularly vulnerable sections. It will also require effective implementation of laws and regulations for natural resources protection through strengthening of and closer interaction among the regulatory bodies and administrative machinery.

Existing laws and enforcement mechanisms should be subjected to periodic review to evaluate their adequacy and efficacy in the light of changed circumstances and experience.

Natural Resource Accounting

As economic policies form the framework for a range of sectoral development, it will be necessary to consider how these policies affect the quality and productivity of environmental resources. This will require a system of resource accounting along-with the other exercises of cost benefit analysis.

In essence, indicators of growth such as GDP should include a measure of depletion cost and value judgments in terms of environmental resources. It will require instruments and expertise for evaluation and conscious tradeoffs, where unavoidable to meet the legitimate development needs.

The Government will prepare, each year, a natural resource budget which will reflect the State and availability of resources like land, forests, water, etc. and which will rationally allocate these resources keeping in view the principles of sustainable development.

Training and Orientation Programmes

Available management resources in the enterprises and projects would be oriented towards natural resource management considerations and expertise to be developed through appropriate training programmes. Intensive training and education programmes will need to be introduced on specialized areas of natural resource management & pollution control.

Awareness Promotion

To raise public awareness and involvement in natural resource management, the mass media ranging from local folk roles to electronic media should serve a vital role.

Promoting Appropriate Technologies

Existing research and development efforts need to be strengthened to develop the appropriate low cost technologies considering the possibilities opened up by biotechnology, genetic engineering, information and material technology and remote sensing, tailored to the local ecological and socio-economic conditions.

Role of Non-Governmental Organisation

Implementation of the NRM Plan would be impossible without active participation of the people. Non Governmental Organisations (NGOs) can play an important role in mobilizing the people at grassroots. This will need a network among NGOs and interface between people and Government to work on community involvement, providing information on natural resources, surveillance and monitoring, transmitting development in science and appropriate technology to the people at large.

NRM Information Centres should be set up at different level to generate knowledge regarding traditional and indigenous system management practices. Village Eco-system Users Group, Forum, Producer Groups and Companies should be empowered which will help and support mobilisation of public opinion and participation in development activities.

Women and Environment

Women at the grassroot level should be actively involved in conservation programmes which should be income generating and self financing and sustainable on a long term basis.

Partnership Role of the State Government

Effective implementation of necessary measures, as outlined in the NRM Plan, will be facilitated by partnership role of the State Government. Hence, the policies and programmes at the State level should be drawn up keeping in view over-all State policy considerations. A monitoring mechanism involving State Government representatives will be set for interaction as required for implementation of the policy initiatives.

Road to Meghalaya's sustained future: Way forward

It is only through such initiatives, the contours of which have been highlighted in this NRM Plan, we will be in a position to resolve the conflicts between the natural resources conservation concerns and developmental pursuits that have a direct bearing on the very fabric of our society and life styles.

The task before us would be daunting if it were not for the many positive factors that are emerging- people's movements to conserve their own natural resources, greater publicity & media concern for awareness among children and youth.

It is up to us, as citizens, to undertake development process keeping in view our heritage, with conservation as the key to sustainable development.

Meghalaya Institute of Natural Resources- The Visionary Organisation

Meghalaya is endowed with vast natural resources and bio-diversity. Sustainable development of natural resources in the given eco-system is vital, as economic growth and long term sustainability cannot go hand in hand. However, there has been largely a bypass in the judicious use of natural resources and bio-diversity affecting sustained economic growth and development. The adverse effects are increasingly explicit in terms of increasing poverty, as nearly half of the population in the State is still below the poverty line.

The Institute of Natural Resources is the convergence platform for line departments- Soil and Water Conservation, Forest and Environment, Livestock, Fisheries, Agriculture, Horticulture, Sericulture and Weaving, Village and Khadi Industries and Community and Rural Development. It facilitates integrated and co¬ordinated support services for the line departments in the area of Capacity Building and Human Resource Development relating to management of natural resources for livelihood promotion under the different Missions.

The institute addresses the issues of sustainable natural resource use by strengthening the capacity of the concerned stakeholders particularly, the farmers and other entrepreneurs who are directly dependant on the natural resources for earning their livelihoods. The Institute facilitates the use of state of art information technology tools, remote sensing tools, GIS platform, Geo-spatial technology, Geographical Positioning System, etc for evolving natural resource management plans by integrating new generation methods together with traditional knowledge on conservation.

Vision

Enrich and empower the stakeholders with knowledge on sustainable natural resources utilization for pursuing multiple livelihood promotion activities

Mission

Facilitate development and dissemination of time-tested conservation technologies and management practices for improved productivity and profitability without deteriorating the natural resource-base

Objectives

- Develop trained cadres for undertaking natural resources management and livelihood promotion in a more effective and sustainable manner
- Enter into partnership with Universities, Research & Development Institutions, Trusts, Research & Training Institutes, Centres of Excellence, etc for providing resource support in the field of natural resources management and multiple livelihood promotion
- Facilitate resource support for the line departments on sustainable natural resources use and livelihood promotion under the different Missions of the IBDLP
- Facilitate knowledge management on sustainable natural resources use for livelihood promotion for different stakeholders in partnership with line departments and other institutions

Implementation Model

1. Human Resource Development

Procurement of subject matter specialist from universities, research and development organisations, research & training institutes, centres of excellence to provide resource support in the area of natural resources management, conservation technologies linked to multiple-livelihood development under the different Missions.

HR development calls for submission of design-brief by the concerned line departments of the Government of Meghalaya for capacity building. The design-brief should include the following:-

- Justification & rationale of the proposal
- Aims and objectives
- Target-group (Govt. Officers, Field Functionaries of Line-Departments, NGOs, Multiple Service Providers, etc)
- Strategy to disseminate knowledge to the natural resources users (entrepreneurs) which shall result in improved productivity, production-gap enhancement and livelihood promotion.
- Need assessment of the training
- Defining course contents to enable to meet the aim and objectives
- Capacity building plan for the year 2012-13, 2013-14, 2014-15, 2015-16, 2016-17including expected number of persons to be trained with budget estimates
- Exposure visits as part of the capacity building plan
- Expected outcome
- Mechanism for monitoring, impact assessment & learning

2. Infrastructure

Support for improvement of the existing Institute's infrastructure under viability gap- funding under the IBDLP

3. Partnership Building

Enter into partnership with resource institutions, line departments of the concerned State Government Departments and Missions of Meghalaya in the form of MOA or MOU to pursue the visions and objectives of the INR.

4. Anticipated Outcome

Well informed and trained cadre of villagers and officers on NRM and Climate Change related matters across the State of Meghalaya


SBI-Iaka Ai Hoghikal Ia Khoa Trai Nam Laiong Ha Ki Thain Hooghyndong, Umran
एसबी-आइए ग्राम स्वरोजगार प्रशिक्षण संस्थान उमरान
SBI-Rural Self Employment Training Institute,Umran
RURAL RESOURCE AND TRAINING CENTRE

Initiatives undertaken by IBDLP

CSIR-NBRI and MBDA- Partnership to Excel

Background

The foundation stone of synergistic association of CSIR-National Botanical Research Institute (CSIR-NBRI), Lucknow and Meghalaya Basin Development Authority (MBDA), Meghalaya was laid down in December 2012. To boost the socio-economic conditions of the people of North-Eastern region, CSIR-NBRI signed an MOU with MBDA on Dec. 14, 2012. On this day, Meghalaya Forest and Environment Minister Mr. Prestone Tynsong inaugurated the Centre of Excellence, at Bio Resources Development Centre (BRDC) Campus, Upper Shillong in the presence of Dr. C.S. Nautiyal, Director, CSIR-NBRI.

The concept was framed to develop the "Centre of Excellence" as a joint initiative of CSIR-NBRI and MBDA to ensure inclusive and sustainable growth of NE Region in general and Meghalaya, in particular. Since then, the common interests, objectives and focus of two organizations are yielding fruits now, which would provide a platform for upliftment of the socio-economic strata.

In view of the immense potential for crops like ginger, potato and vegetables and also for commercial plants like geranium which is used for making perfumes, CSIR-NBRI has selected few technologies befitting the soil and climate in Meghalaya.

Major thrust areas for collaboration

• Sustainable agriculture

A significant feature of this partnership is specific mission mode interventions in Agriculture (use of bio-inoculants), Horticulture (floriculture, medicinal & aromatic plants), Plantation crops (betelvine) with main objective of promotion of sustainable livelihoods for the people of the State leveraging on the opportunities and strengths of the State's natural resources.

• Biodiversity prospection and product development

Proper Assessment of the natural resources available within the different basins and catchment areas of the State has been done to ensure proper and sustainable utilisation of such resources. These resources may be used in food production, pest control, and the development of new drugs, aroma compounds, natural dyes and for other related biotechnological applications and products. CSIR-NBRI would provide its knowledge base and research infrastructure for bio-prospection of the plant diversity and development of herbal, nutraceutical, cosmoceutical products.

• CSIR-800

The mission Statement of CSIR-800 programme is inclusive growth and improved quality of life for India's 800 million citizens through science and technology interventions that are socially and economically relevant. The value addition is proposed through introduction of dehydrated floral crafts for augmentation of income which is in great demand in national and international market and offers great scope for women empowerment.

• Need based R&D support

During the partnership, the problem areas in gearing up the ongoing developmental programmes of MBDA would be identified and CSIR-NBRI will provide support to resolve the scientific and technological issues.

• Human resource development

The CSIR-NBRI will provide opportunities and resources for development of human resources at various levels including training on using high end research equipments through programmes on awareness generation, capacity building and training in different areas.

Progress so far

Bio Resources Development Centre (BRDC) has an experimental farm near Mattilang Park at Upper Shillong. Medicinal and aromatic plants (MAPs) were selected as the first group of focus crop for promotion of sustainable livelihoods for the people of the State. Central Institute for Medicinal and Aromatic Plants (CIMAP), another CSIR lab in Lucknow, currently headed by Dr. Nautiyal, joined the alliance for introducing MAPs in the State of Meghalaya. Based on the soil and climatic conditions of the State and potential of MAPs, CIMAP and NBRI finalized to evaluate the following crops at the experimental farm of BRDC.

Artemisia annua:

Artemisinin and its derivatives are a group of drugs that possess the most rapid action of all current drugs against malaria. Treatments containing an artemisinin derivative (artemisinin-combination therapies) are now standard treatment worldwide for malaria. The starting compound artemisinin is isolated from the plant Artemisia annua. The herb, which has its origin in China, was introduced some 10 years ago in India by CIMAP. CIMAP has the agro-technology and improved variety of the herb and has been providing the technical assistance as well as seeds for commercial cultivation of the plant to about 200 farmers from Uttarakhand and Uttar Pradesh.

Geranium:

It is an aromatic herb, which is commercially cultivated for its oil called geranium oil. The oil is used for making perfumes, soaps and cosmetics. Presently, the annual production in India is about 5 tonnes and about 150 tonnes of geranium oil is imported annually. CIMAP has developed new high yielding variety suitable for growing in Uttar Pradesh and Uttaranchal States of India. The successful introduction of Geranium in Meghalaya would provide expansion in its geographical limits, generally limited to the hilly regions of Southern India.

Other aromatic crops:

CIMAP has perfected the production and processing technologies for several medicinal and aromatic plants. These technologies increase yield as well as quality of essential oils using different types of improved and highly efficient processes developed through continuous R&D efforts. Out of several such crops, Damask Rose, Lemongrass, Citronella, Peppermint and Vetiver were prioritized for evaluation of growth, yield and oil quality in the State of Meghalaya.

The team of scientists; Dr. HS Chauhan, Senior Principal Scientist from CSIR-CIMAP and Dr. SK Tewari, Principal Scientist, CSIR-NBRI visited Shillong during 11-14th of February 2013 to undertake and complete the proposed activity on MAPs. On the first day, the two plantation and experimentation sites, viz., Bio Resource Development Centre and Horti Hub were visited. The nursery beds and field beds were prepared in their supervision and plantation of Geranium cuttings and plants, Artemisia seedlings, Damask rose cuttings, slips of Vetiver, Citronella, Lemongrass, Mentha piperita suckers were done. The nursery of Artemisia was also sown. Plants of Artemisia (25), Geranium (10) and cuttings of Damask rose (100) were provided to Horti-Hub for planting purpose. Some seeds of Artemisia were provided to BRDC for nursery sowing at later dates.

CSIR-NBRI bio-inoculants:

CSIR has developed stress (abiotic and biotic) tolerant bio inoculants for diverse soil and climatic conditions. These formulations are useful as plant growth enhancer for seed, soil and foliar applications and improve the soil health, crop yield and quality. Applications of the products have increased the yield of several economically important crops. CSIR Award for S&T Innovation for Rural Development (CAIRD) 2011 has been conferred on CSIR-NBRI, Lucknow and Directorate of Agriculture, Government of Uttar Pradesh for 'Plant Growth Promoting Microbial Bioinoculants for Enhanced Crop Productivity'.

During the visit of scientists on the 13th of February, a group of women farmers were trained on importance and application of biofertilizers. They also met senior officers of agriculture and horticulture departments of Meghalaya for planning the trials and demos on CSIR-NBRI biofertilizer.

Four packets of 25g each of Trichoderma harzianum were provided to DR. S.K.Sharma for use in tissue culture of Orchids to improve the survival and growth. The packets of Phosphate Solubilising Bacteria (PSB, 10 kg), along with information on application techniques were provided to BRDC with instructions for conducting field demonstrations to the two Master Trainers, Ms. Lizbeth Sangma and Mr. Indrajit Bhowal.

During March 2013, 22 farmers from Laitmynsaw, Myrkhan and Nongpyiur were selected for demonstration of biofertilizers. Two districts, Ri- Bhoi and West Jaintia hills were visited for demos on PSB in other crops like Ginger. Another 10 kg of PSB culture was sent by post in March 2013. The master trainers carried another 5 kg PSB during their two weeks training at CSIR-NBRI in May 2013. There was 29% increase in growth levels of the PSB treated plants with respect to the untreated ones. Four crops including Potato, Tomato, Chilli and Beans have been taken into account with respect to the PSB usage in the different farmer's fields.

Oranges

To promote and showcase to the world the famous local oranges known as the Khasi Mandarin grown abundantly in Khasi and Jaintia Hills, the samples of oranges from Narwan and Nongjrong were provided for analysis and benchmarking. The preliminary analysis results have suggested leads to move further in promoting these as special fruits.

Turmeric

Lakadong turmeric grown in Jaintia Hills is said to be one of the best. However, the production is low and sold at a very low price. Lakadong turmeric is a much sought after variety by the extraction industry because of its high curcumin content. Samples of Lakadong turmeric were provided for analysis and benchmarking.

Status of Medicinal & Aromatic Plants Nursery

The medicinal and aromatic plants (approximately 2500) which were provided to BRDC-NBRI, SC and Horti-hub between 12-14th of February 2013 are surviving well. The survival of Geranium cuttings was poor due to extremely dry weather and time lag in cutting and transplanting. Artemisia seedlings have developed well which is sufficient for 1 acre and the land is also ready for the multiplication.

For the extraction of the oil and quality evaluation, few more months are required as the planting materials are not ready for extraction. More Geranium plants will be brought from CSIR-CIMAP for further evaluation. Artemisia annua is also being multiplied and its oil will be extracted and checked for quality. Scented Rose cutting (1123) and plants (10) are also growing well. Grasses such as Vetiver, Citronella and Mentha (Peppermint) have been planted in the farm along with Lemon grass.

Training of MBDA Interns

Two Master Trainers, Ms. Lizbeth Sangma and Mr. Indrajit Bhowal, working at CSIR-NBRI BRDC Shillong Centre were deputed to CSIR-NBRI for a two weeks training programme during 6- 17th May 2013. The trainees spent one week each at CSIR-NBRI and CSIR-CIMAP, getting hands on training on various technologies like biofertilizers, tissue culture, floriculture, vermi - composting, dehydrated floral crafts and production, processing and quality evaluation of medicinal and aromatic plants.

Floriculture

Gladiolus is a very promising and economic floriculture crop for introduction in Meghalaya. CSIR-NBRI has released several Gladiolus varieties and popularized its cultivation in plains of U.P. Corms of four Gladiolus varieties viz., Rashmi, Amethyst, Rashmi and Neelima, released by CSIR-NBRI were provided to MBDA interns on the National Technology Day, 11 May 2013 at Lucknow. These varieties will be multiplied and evaluated at BRDC farm in Shillong.

Future Action Plan

- Expansion of biofertilizer application in other crops and estimation of yield, quality along with soil health
- Analysis of oranges and turmeric for promoting the brand value
- Organizing training programme for government departments and NGOs to promote Dehydrated Floral Crafts as economic empowerment tool
- Yield and quality estimates of medicinal and aromatic plants, grown at BRDC, Shillong and their further multiplication

Broomgrass-Base Farming

Despite numerous differences of opinions and thoughts, broomgrass cultivation has picked up in Meghalaya. One school of thought says that broomgrass cultivation should not be promoted as it is not eco-friendly etc. Another opinion is that for as long as it is people's choice, it should be left at that, unless other remunerative kinds of farming practices are given and suitable as a replacement. They further advocated that value addition from broomgrass should be explored and encouraged instead. Traditionally, broomgrass is grown in such areas where agriculture and horticulture farming cannot be taken up, example, rocky or stone waste-areas, very steep waste land, etc. It is generally opined that broomgrass when grown cannot be eradicated and if it is to be eradicated it may require a good amount of investment.

The Broomgrass-Base Farming practiced in village Mawlyngbna shall address the above differences and contention. Mawlyngbna village is located in Mawsynram Block; East Khasi Hills District and is situated at about 74kms from Shillong and 19kms from Mawsynram respectively along the Mawsynram-Hatmawdon road. The location of village Mawlyngbna is on the road connected to Thyllaw village.

Advantages of the Broomgrass-Base Farming model

1) It provides short-term income during the gestation period of other plantation crops which would provide long-term benefits
2) Plantation crops grown are arecanut, bay leaf, citrus, pineapple and many others. Black pepper (Piper nigrum), Betel leaf are also grown on forest tress available inside the plantation
3) This system would also act as crop insurance cover
4) This model provides the opportunity for diversification of crop diversity
5) It provides space for promotion of fauna.The broom grass, which is a sun shine loving plant, gradually dies out when the upper canopy of the plantation crops is built-up. It is reported that this broom grass-based farming was a traditional practice particularly in villages along the southern slope (Ri Bhoi region).

It is hoped that the above base farming will help the institute to undertake a detailed study so as to enable to take decide on the policy options for the future.

Integrated Farming System Model under the Integrated Basin Development and Livelihood Programme (IBDLP)

Background

In Meghalaya, where majority of the farmers are either small or marginal, the income from agriculture sector in their farm is not at all sufficient to run their families. Due to fragmentation of land - holdings, even after adoption of improved agricultural technology and practices, their economy condition has not improved.

Integrated Farming System may be defined as a set of agricultural activities organized into a functional unit to profitably harness the solar energy while preserving land productivity, environmental quality and maintaining the desirable level of biological diversity and ecological stability. Integration of different agricultural allied enterprises with crop activity as base would provide ways to reuse and recycle produce and waste material of one component as input in the other linked component. This will help in reducing the cost of production of the economic produce will finally enhance the net-income of the farm as a whole.

Objective

1. Integrate different production systems like dairy, poultry, livestock, fishery, floriculture, horticulture, apiculture, etc with agricultural crops production as the base
2. Increase farm resource use efficiency (land, labour and production/by-products) so as to increase farm income and gainful employment opportunity
3. Promote multi-cropping (out of the total cropped areas of 265816 Ha, only 46697 Ha (18%) is sown more than once), for multi-layered crops of economic value so as to sustain land productivity
4. Maintain environmental quality and ecological stability

Opportunities

1. Productivity: Increase economic yield per unit area - per unit time by virtue of intensification of crops canopy, agricultural crop rotation and allied enterprise
2. Profitability: The system, as a whole provides opportunity to make use of produce and waste material of one component as input on the other component at the least cost
3. Potentiality and Sustainability: In Integrated Farming System, organic supplementation through effective utilisation of by-products of linked components as a measure is possible and this will certainly provide opportunity to promote soil health and to sustain the potentiality of the soil which is the production base
4. Balanced food: In Integrated Farming System, we link components of different nature enabling to produce different sources of nutrition, namely, protein, carbohydrates, fats, minerals, vitamins, etc from the same unit area. It will provide opportunity to mitigate malnutrition problem of the farmers
5. Pollution: In crop based activity, some of the organics are left as waste materials which in turn pollute the environment on decomposition. Application of huge quantity of fertilizers, pesticides, weedicides, insecticides, etc pollute soil, water and air. Much of the wastes could be converted or recycled to some other forms of economic or ecological or social value, under the Integrated Farming System
6. Integrated Farming System provides opportunities as crop insurance cover as money round the year is obtained from different farm produce
7. Technology Infusion (R&D) integrated with indigenous and traditional knowledge
8. Mitigating energy crisis
9. Climate change programme from the perspective of adaptive mitigation
10. Mitigating the wood, fodder crisis, etc
11. Avoid degradation of land resources
12. Provide opportunities for Agri-oriented industries, tourism and related tourism based activities, etc
13. Mitigating rural- urban exodus

Components of Integrated Farming System

1. Agriculture
2. Livestock
3. Fishery
4. Sericulture
5. Silviculture
6. Horticulture
7. Mushroom culture
8. Bio-Gas
9. Apiculture
10. Tourism
11. Fish, Bird, Wildlife-Sanctuary Development, etc.

Integrated farming system-Model

While the integrated farming system appears to be an alternative innovation, its innovation is not as easy as it looks like. It is not merely addition of one or more components to the farmer's existing system, but, an entirely new farming system which requires a new set of technological management practices.

Different enterprises will have to be involved in this system. The need for keeping all the systems in balance as per requirement because over concentration towards one will be detrimental to the other.

Thus, for integration, the following points must be considered:

1. Productivity and profitability
2. Technical feasibility and economic viability
3. Socio- cultural adaptability
4. Sustainability with existing resource and infrastructure

Conclusion

Our farming community is used to the farming system approach as evidently seen in management of household gardens etc, happening around us. So, what is required for farming at present is how we could improve the productivity of the existing farming system with technological intervention and integration of tradition knowledge so as to trigger some kind of economic activity keeping in mind the ecological concerns.

Self Sustained Residential Schools Located in Rural Areas

The Idea

Educational Institutions preferably residential schools in rural areas are the assets to the community. It is imperative to build the capacity of the students in these schools to promote entrepreneurship skills and make them important stakeholders in promoting rural development. Under the programme it is proposed that academic learning will be enhanced with exposure to the idea of sustainable rural development, so that such schools becomes places of learning and knowledge, where knowledge and information is disseminated to the community. Such residential schools would further provide space for students to explore their potentialities, untapped skills and talents. The students will be given necessary skills through training and capacity building, this will enhance their knowledge and skill sets subsequently they will be able to upscale their functioning in various activities they taken up and gradually upgrade themselves to being entrepreneurs.

Objectives:

1. Orient the youth towards rural characteristics
2. Integrate scientific as well as traditional knowledge for improving skills
3. Provide easily accessible space to different departments to introduce, demonstrate and pilot their projects
4. Provide space of their own and participate actively in the sphere of planning and development through dissemination of knowledge and information regarding rain water harvesting, best practice in the field of agriculture, horticulture, etc
5. Develop a sense of dignity of labour among the youth
6. Develop soft skills which will further enhance their entrepreneurship skills
7. Promote youth affairs and sports as also innate culture and traditions

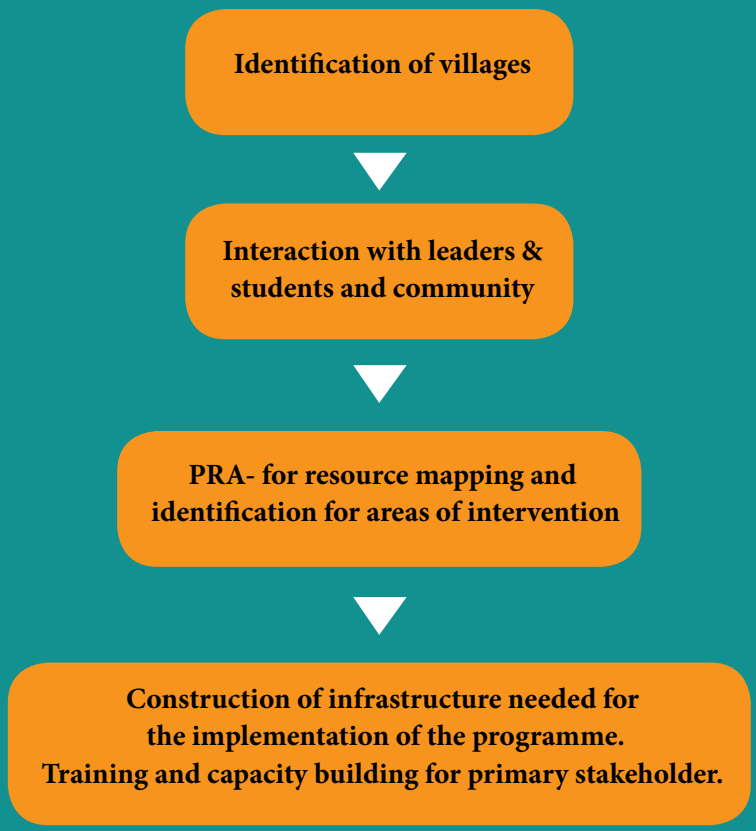
Implementation strategy

This model would be implemented in residential schools, where the school management and students would be the primary actors and community as a source of support. The programme will utilize the space in the school to carry out its activities as a means that will complement to academic learning.

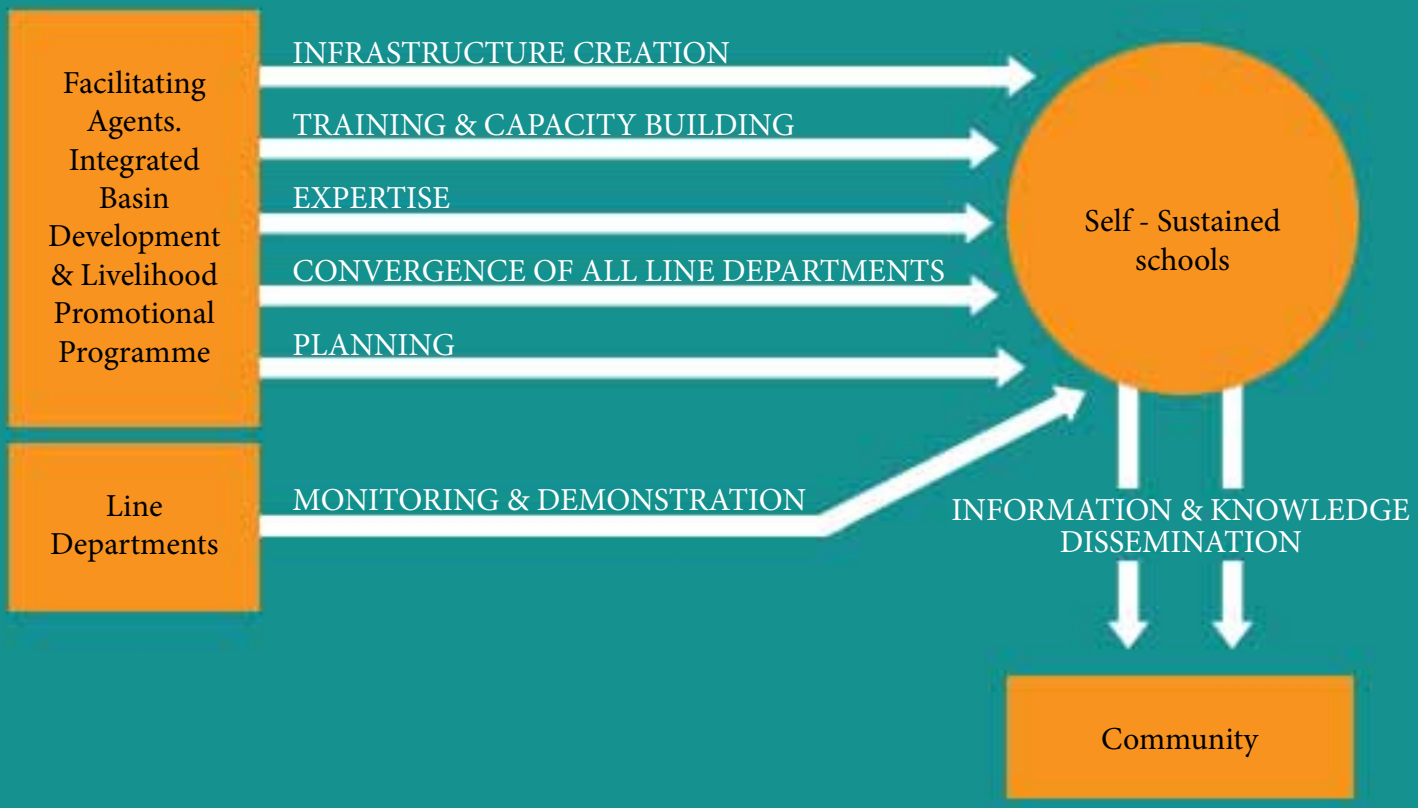
Activities will be taken up first by identifying the needs of the village through participative approach and subsequent decision will be made. The interests, needs, aspiration and expectation of youth will also be given priority while taking into consideration the development of the village as a whole.

The line departments will also play a vital role in making this programme successful. For example the Soil & Water Conservation department will be able to provide necessary services; knowledge, technical, material, etc for taking up various activities such as rainwater harvesting, ground water recharge, etc. Besides, line department would be given the responsibility to monitor and evaluate the projects that are taken up.

Steps involved in the implementation process:



Operational design:



Outcome:

The outcome of the programme can be summarised into the following:
a) Providing first hand information at the village level thus enhancing the knowledge services in the village
b) All round development of students and at the same time promote cultural and traditional practices
c) Entrepreneurship development
d) Orient the youth towards responsibility to the society
e) Dignity of labour is recognized

Meghalaya State Natural Disaster Monitoring Centre (MSNDMC) & Sub-Watershed Level Automatic Weather Stations (AWS)

Introduction

Meghalaya is state, which due to its unique geo-topographical set up, is extremely prone to the ravages of climate and natural calamity. The State is located in the most sensitive seismological zone expecting strong intensity earthquakes every now and then. The State is located in one of the heaviest rainfall regions in the globe, which results in massive soil erosion and landslides on the hill slopes. The plain area of the State bordering Assam & Bangladesh experiences flood every year which results in large scale destruction of agriculture crops, animals and human life.

With this background in mind, the Meghalaya Basin Development Authority (MBDA), in active collaboration with the North East Space Application Centre (NESAC) & Meghalaya State Information Technology Society (MSITS) has proposed the idea of establishment of the Meghalaya State Natural Disaster Monitoring Centre (MSNDMC) in Shillong, with a chain of Automatic Weather Stations (AWS) in all the 179 numbers of Sub-Watersheds spread across 11 districts of the State.

The MSNDMC is expected to be a catalyst for the creation and provision of science that meets the needs of the State of Meghalaya in particular and the NE Region in general. MSNDMC will collaborate with partners with the existing R&D facilities in the region on one hand, and with the local institutions that understand local needs and capacity on the other. MSNDMC will develop research and tools which are "demand-driven" helping solve specific development, adaptation and research management issues of the State & the region.

Mission Statement

The mission of the Meghalaya State Natural Disaster Monitoring Centre (MSNDMC) is to enhance the capability of the society to understand, anticipate and manage the impact of climate change & natural disaster in order to improve human welfare and the environment. The MSNDMC conducts this mission through strategic and applied research, education, capacity building, and by providing forecasts and information products with an emphasis on practical and verifiable utility and partnership.

Aims & Objectives

MSNDMC will serve as a common platform to the various response players in the field of climate change & natural disaster management by providing timely proactive science and technology inputs.

The Centre will provides inputs to the farming community, agriculture and allied sectors, transport sector, power and electricity sector, State and District level Disaster Management Authorities, health sector etc., through State of the art natural hazards monitoring sensors, information and communication system.

Disaster Management is multidisciplinary and has complexity of information sharing and reporting. It is common experience that information is not available on real time to the community and response players. It takes long time to obtain the information and lot more time to integrate and generate information, reports, advisories. This Model of disaster management will be helpful in filling up these existing gaps and will ensure forecasting early warnings, advisories and preparedness in management of climate risks & natural disasters.

The Disaster Management Act 2005, Government of India reiterates paradigm shift in Disaster Management from rescue, relief centric approach to preparedness, early warning approach. It is said that money spent on early warning and preparedness helps in reducing the cost on rescue, relief and rehabilitation (reframe this to exclude the term dollars) The investment made on early warning and preparedness has high cost-benefit ratio.

The main objectives of MSNDMC are:

1) Hazard mapping and vulnerability studies
2) Human Resource Development mainly by imparting training
3) Help deliver and improve climate & disaster related science that responds to the demands of decision makers in different economic sectors
4) Develop, explore and evaluate climate & natural disaster risk management strategies
5) Strengthen development through the integration of climate & disaster risk management
6) Capture and manage knowledge, train and share information in support of managing climate & disaster related risks
7) Create opportunities to link institutions; to learn, educate, build capacity and share knowledge of climate & disaster proof practices- for improved climate & natural disaster risk management
8) Strengthening of information technology for Natural Disasters Management
9) Natural Disaster early warning system

Services Expected From MSNDMC:

1) Dissemination of warning
2) Weather forecast & agriculture advisories to farming community
3) Providing value based services in management of:
    a) Drought
    b) Flood
    c) Cyclone
    d) Hailstorm
    e) Heavy winds
    f) Storm Surges
    g) Earthquake
    h) Landslides
4) Advisories & services to :
    a) Common man
    b) Agrarian Community
    c) Agro based sector
    d) Transport Sector
    e) Power and Energy
    f) Irrigation
    g) Others

Implementation arrangement

MSNDMC will be an initiative of MBDA, with active technical & infrastructural support from the NESAC, MSITS, IMD, GSI, State seismological observatory & the meteorological department. It will also have strategic partnership with all the other departments related to the climate & natural resources like Agriculture, Horticulture, S&W, water resources, livestock, forest & environment etc. It will also have strategic linkages with all the R&D institutions in the State & the NE Region, educational institutions, universities and prominent NGOs.

At the State level, MSNDMC will be situated at Shillong, adjacent with the Institute of Natural Resources.

The field level stations will be set up in the districts through the Basin Development Units, chaired by the Deputy Commissioners of the districts.

The MSNDMC, both at the State and the district level, will be managed by a group of professionals.

The Governing Council of the MSNDMC

The Governing council will be chaired by The Chief Secretary to the Government of Meghalaya with the following members:

- Additional CS (Finance) / Principal Secy. (Finance) / Commissioner Secy. (Finance)
- Additional CS (Planning) / Principal Secy. (Planning) / Commissioner Secy. (Planning)
- Principal Secy. ((Revenue and Disaster Management)
- Principal Secy. (Forest, Agriculture, Sericulture, Health, Water resources, IT)
- Director NESAC, Director ICAR, Director Health
- Dr. Ajit Tyagi, Retd. DG, IMD, New Delhi

The Governing Council may co opt any other members to the Council.


RISE FACILITATION CENTRE
WILLIAMNAGAR
Under MIBDLP
Inaugurated on
12th of December, 2012
By
Dr. Mukul M Sangma


MERRITT


Himani

Published by

Meghalaya Basin
Development Authority

Prepared By

SFAC
लघु कृषक
कृषि व्यापार संघ