

# FOURTH CONFERENCE

*of*

**The North Eastern Economic Association**

*on*

**"AGRICULTURAL TRANSITION IN THE HILL  
AREAS OF THE NORTH EASTERN REGION"**

**September 7-8, 2001**



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**PROCEEDINGS VOLUME**

**Organised by SHILLONG COLLEGE, SHILLONG - 793003**



# FOURTH CONFERENCE

OF

THE NORTH EASTERN ECONOMIC ASSOCIATION

SEPTEMBER 7 - 8, 2001



## Proceedings Volume

*Agricultural Transition in the Hill Areas  
of the North Eastern Region*

ORGANISED BY  
SHILLONG COLLEGE,  
SHILLONG - 793 003



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Published by:

**Shri B.Syiem**

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Shillong College

Shillong - 793003

March 2002

Printed at:

**Monolith Media Network**

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**FOURTH CONFERENCE**  
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**THE NORTH EASTERN ECONOMIC ASSOCIATION**  
**ON**  
***Agricultural Transition in the Hill Areas***  
***of the North Eastern Region***

**SEPTEMBER 7 – 8, 2001**

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***Agricultural Transition in the Hill Areas  
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**SEPTEMBER 7 – 8, 2001**

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**FOURTH CONFERENCE**

**OF**

**THE NORTH EASTERN ECONOMIC ASSOCIATION**

**ON**

***Agricultural Transition in the Hill Areas  
of the North Eastern Region***

**SEPTEMBER 7 – 8, 2001**

**PROGRAMME**

**INAUGURAL FUNCTION**

**September 7, 2001 (Friday)**

**9:30 a.m.**

Chairperson :

Dr. (Mrs.) M. P. Rina Lyngdoh  
Principal, Shillong College

Welcome Song

Students of Shillong College

Welcome Address

Chairperson

Address

Shri R. Kharpor  
President, Governing Body  
Shillong College

Key Note Address

Dr. P. M. Passah  
Vice-President, N.E.E.A

Inaugural Address

Chief Guest, Shri E. K. Mawlong  
Hon'ble Chief Minister of Meghalaya

Release of the Souvenir

Hon'ble Chief Guest

Vote of Thanks

Shri B. Syiem  
Secretary, Organising Committee

7<sup>th</sup> SEPTEMBER 2001 (Friday)  
11.00 a.m.

: SHILLONG COLLEGE, SHILLONG- 793 003

**BUSINESS SESSION – I**

: **Status of Jhum Cultivation**

**Chairman : Shri. K. L. Tariang**  
**Director of Soil Conservation, Meghalaya**

Dr. (Ms.) M. Dasgupta, Honorary Associate, Centre for Urban Economic Studies  
Department of Economics, University of Calcutta

Dr. N. M. Singh, Department of Economics, Manipur University

Shri P. K. Dhar, Department of Economics, Bongaigaon College, Assam

Dr. N. Roy, Department of Economics, Karimganj College, Assam

Dr. S. Borbora and Shri R. Mahanta, IIT, Guwahati

Shri E. Iboyaima Singh, Department of Economics, Manipur College, Manipur

Smt. P. Borthakur, Department of Economics, C.K.B Commerce College, Guwahati

2.00 p.m.

**BUSINESS SESSION – II**

: **New Trends in Cropping Pattern**

**Chairman : Dr. N. Srivastava**  
**Professor of Economics**  
**N.E.H.U. Shillong**

Smt. T. B. M. Lynser, Department of Agriculture, Shillong.

Dr. Jagadish Kalita, Department of Economics, Barama College, Nalbari, Assam.

Dr. S. Islam, Department of Economics, K. C. Das Commerce College, Guwahati

Shri S. B. Singh, Indian Council of Agricultural Research. Meghalaya.

Smt. P. Priyadarshini, Arunachal University, Arunachal Pradesh.



8<sup>th</sup> SEPTEMBER 2001 (Saturday)  
10. 00 a.m.

SHILLONG COLLEGE, SHILLONG – 793003

**BUSINESS SESSION – III**

**Dairy and Animal Husbandry**

**Chairman : Shri B. Singh, IFS**  
**Principal Chief Conservator of Forests,**  
**Govt. of Meghalaya**

Dr. J. S. Jyrwa, Department of Veterinary, Meghalaya

Dr. B. Plain, Department of Veterinary, Meghalaya

Dr. W. Lato, Regional Cross Breed and Cattle Breeding Project,  
Kyrdemkulai, Meghalaya

1.00 p.m.

**BUSINESS SESSION – IV**

**Horticulture and Plantation Crops**

**Chairman : Dr. N. Mohendro Singh**  
**Professor of Economics**  
**Manipur University, Imphal, Manipur**

Dr. (Mrs.) E. Kharkongor, Department of Economics,  
Shillong College, Shillong

Dr. F. S. Rasul, Office of the Registrar of Co-Operative Societies,  
Assam, Guwahati

Shri R. Arumugam, Department of Economics, Government College,  
Itanagar, Arunachal Pradesh

Shri D. Nath, Goalpara College, Goalpara, Assam

Dr. H. Bareh Ngapkynta, Ex – Professor, NEHU

Smt. A. Mahanta, Darrang College, Tezpur, Assam

## VALEDICTORY FUNCTION

Chairperson:

Dr. (Mrs.) M. P. Rina Lyngdoh  
Principal, Shillong College  
& President, Organising Committee

Valedictory Address

Shri P. J. Bazeley, I.A.S  
Principal Secretary  
Government of Meghalaya.

Chief Guest's Address

Shri A. H. Scott Lyngdoh  
Hon'ble Minister of Finance Etc.,  
Government of Meghalaya.

NEEA Vice President's  
Remarks

Dr. N. Mohendro Singh

### Observations by Participants

Convener's Remarks

VOTE OF THANKS



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*22nd January, 2002*

### **FOREWORD**

The Fourth Conference of North Eastern Economic Association debated issues which are of vital importance to the economic and social life of the people of North East India. The focus of the Conference was on issues relating to agriculture, which is the basic economic activity of our people. This, obviously, is also a primary determinant of their social and cultural life. The juxtaposition of traditional agricultural practises and the introduction of modern methods and technical knowledge as well as radical changes brought about by larger economic dynamics of the country and indeed of the world generates problems that must be addressed with utmost seriousness.

The papers brought together in this volume were originally presented in the Conference and they draw our attention sharply to these problems. I have no doubt that the volume will be an important contribution to the understanding of the human predicament of the North East today.

*Mrinal Miri*

( Mrinal Miri )

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## NORTH EASTERN ECONOMIC ASSOCIATION

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K. K. Bhatta Road, Chenikuthi, Guwahati – 781 003

### ABOUT THE ASSOCIATION

The North Eastern Economics Association (NEEA), a non-political, non-partisan, voluntary regional economic association with a national perspective, was formed on 19<sup>th</sup> February, 1997 with headquarters at Guwahati. The Association has been registered under Societies Registration Act XII of 1860.

*The main objective of the Association includes :*

- a. Undertaking, coordinating, promoting and collaborating in the study of socio-economic problems and issues with emphasis on the North Eastern Region of the country.
- b. Providing a common platform for interaction of ideas and exchange of experiences, and
- c. Contributing towards promoting of an atmosphere conducive to research.

These objects are sought to be achieved by :

- a. Undertaking, organizing, collaborating and coordinating studies/researches in socio-economic problems and issues.
- b. Holding periodic conferences, seminars, symposia, discussions etc. in different parts of the Region.
- c. Publishing books, reports, booklets, monographs, papers or summaries of papers, either separately or collectively, in a periodical which may be issued under the auspices of the Association.
- d. Cooperating and collaborating with other institutions/bodies having similar objects.
- e. Taking all such lawful steps as are incidental, necessary and conducive for the attainment of the aforesaid objects.

Persons/Institutions interested in the study of socio-economic problems and issues subscribing to the objectives of the Association are eligible to apply for membership. At present there are 200 members of the Association of which 160 are life (including founder) members. Two of our life members, Dr. Nanda Kumar Dey of Dibrugarh University and Mrs. Renu Saikia of Guwahati Commerce College are no more amidst us. There are members from each of the seven States of North East and also from other States of the Country like West Bengal, New Delhi and Andhra Pradesh belonging to various disciplines over and above Economics such as Statistics, Political Science, Commerce, Education, History, Geography, Home Science and even Medicine.

The activities of the Association is managed by an Executive Committee of 7 office members and 16 members. The Association has so far organized three Conferences. The First Conference was held during April 8-9, 1998 at Guwahati on the theme "Development policies and Development Experience in the North East". The Second Conference on the theme "Economy of the North East beyond 2000" held during February 10-12, 1999 was hosted by Margherita College, Margherita. The Third Conference hosted by Manipur College, Imphal was held during December 18-19, 1999. The theme of the Conference was "Resource Mobilisation in the North East. The Fourth Conference held during September 7-8, 2001 was organized by Shillong College, Shillong and the theme chosen for the Conference was *Agricultural Transition in the Hill Areas of North East India*.



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**Dr. (Mrs.) M. P. R. Lyngdoh**

*Principal, Shillong College*

*President, Organising Committee*

On behalf of the Shillong College fraternity and the North Eastern Economic Association, we would like to extend our warm welcome to the Honourable Chief Guest, Shri E. K. Mawlong, Chief Minister of Meghalaya, who has kindly consented to be with us today to grace the inaugural session of the Conference on "Agricultural Transition in the Hill Areas of the North Eastern Region", in spite of the stress and strain arising out of the situation in the state. We also welcome Shri K. L. Tariatang, Director, Soil and Water Conservation, and other members of the Governing Body. Our heartiest welcome to all our resource persons, delegates, participants, representatives from the various departments and organizations, and all our distinguished guests, friends, ladies and gentlemen.

The two day Conference is being attended by delegates from the North Eastern Economic Association, scholars and experts from different departments. Their presence will enable us to identify problems related to agriculture in the region and give solution for the progress and development of agriculture which is the mainstay of the country's economy in general and the North Eastern Region in particular. As we are aware, agriculture is the most important sector of the national economy, about 70% of the total population of the country lives in rural areas and depends on agriculture alone. When we talk of rural development, it is linked with agriculture development. Therefore, there is a need to improve the socio-economic life of rural people through modernization of agriculture and allied activities and proper marketing facilities so that the real benefit goes directly to them. The Integrated Rural Development Programme introduced by the Government is one step to help the rural poor and is linked with agriculture and other activities. There must be a uniform development in the rural sector. In the North Eastern Region, 75 to 80% of the people depend on agriculture and reside in rural areas still practicing primitive methods of agriculture. In this Conference, some sub-themes have been identified to be discussed during the different sessions. There are (1) Status of jhum cultivation (2) New trends in cropping patterns (3) Prospects and problems of plantation and Horticulture (4) Land-tenure system and land relations (5) Dairy farming and animal rearing (6) Geographical specific farming in the hill. These sub-themes will be able to cover the different aspects of agriculture, their problems and remedies.

The usual complaints that we hear from the farmers are the non-availability of seeds and fertilizer, lack of proper marketing facilities and the unorganised small farmers are being exploited by middlemen and traders. Majority of the people in the North Eastern Region live in the rural areas in villages and scattered homesteads. The geographical condition of the region is hilly and sloppy and most of the villages are difficult to access and there are problems of transport and communications and marketing of their products except through local village market. To improve their lot, strategies have to be evolved. Scientists and experts are to involve in rural development through different training programmes and village adoption schemes. The most prevalent form of agriculture in the region is the old method of cultivation or jhumming. Therefore, there is a need for application of suitable scientific Technology under the existing jhumming system of agriculture.

The country as a whole has to tackle the problems of poverty, illiteracy, unemployment, regional imbalances and other social and economic problems to usher in an era of progress and prosperity of the nation in the 21<sup>st</sup> century.

I am confident that the deliberations during the different sessions will focus on the various problems pertaining to agriculture and offer specific suggestions for improvement of the agrarian sector in the region. I wish the delegates coming from outside the state a pleasant stay in Shillong and I am hopeful that you will have a very fruitful deliberation.

*Thank you  
Khublei, Jaihind*



## KEY – NOTE ADDRESS

### AGRICULTURAL SECTOR : GROWTH AND DIVERSIFICATION

**Dr. P. M. Passah**

*Vice-President, NEEA*

The Agriculture Sector is generally the largest and the most important sector of most underdeveloped and developing economies like India. Not less than 70 percent of the population in each of these countries depends upon agriculture and even those who are not wholly dependent upon agriculture are associated to it in more than one way through trade in agricultural products, through work in agro-based industries, etc. But this sector is also the most backward. Collin Clark attributes the cause of this backwardness and underdevelopment to the high density of agricultural population with low agricultural productivity. But it must be realised that immense improvements are possible in agricultural productivity in most parts of the world. What is needed is education and technological knowledge and of course, capital. But this address would not be confined directly to these requirements. It will only give a quick bird's eye view of the growth and diversification of the agrarian economy.

### AGRICULTURAL GROWTH

With regard to agricultural growth, we will only look at the output of foodgrains vis-à-vis food security. Despite the fact that there is enough cultivable land in the world to feed the existing population based on Collin Clark's analysis<sup>1</sup> and despite substantial increase in food production in the last two decades, there are over 800 million people in poor countries who go to bed hungry everyday. We heard of starvation deaths even today in North Korea, Indonesia, Bangladesh and even India. The prediction of the International Food Policy that the developing countries may face a crisis in the near future because of declining trend in agriculture, may come true. In fact, the situation has been quite grim in Africa and South America which have been facing acute food crisis due to high population growth. According to the Food and Agricultural Organisation (FAO) projections, the number of undernourished may decline to 575 million in 2015 and 400 million in 2030. One is, however, reminded of the Rome Declaration of the World Food Summit which called for reducing the number of the undernourished to half by the year 2015.

### The Indian Scene

Based on established nutrition norms, India needs around 260 million tonnes of foodgrains to feed its present population of more than one billion. Thus the present food output of around 210 million tonnes is not enough to feed an ever-increasing population if the entire half-fed population is fully provided. The population rise has, in fact, nullified the benefits of higher production and has been posing a threat to food security. According to statistics, there are more than 250 million people in India considered to be food-insecure and almost half of the women in the 15-49 age group and three-fourths of the children are anaemic.

It is indeed anomalous to speak of food insecurity and the need to increase food production at a time when there is surplus foodstock in the country's godowns whose value is estimated at Rs.50,000 crore<sup>2</sup>. It is a great paradox of surplus foodgrains and hungry stomachs. The United Nations Fund for Population Activities (UNFPA) in its recent report has confirmed that millions of the rural poor in India are not adequately fed despite the sizeable gains achieved in agricultural productivity after the Green Revolution. The rural poor are being denied their daily full quantum of energy requirement in contrast to the rapid rise in urban prosperity. Thus, adequate steps have to be taken on the agricultural sector along with properly designed poverty alleviation programmes so as to guarantee food security to the rural poor. It has been admitted at the highest level, that there is a system failure on the food front for the poor notwithstanding the strong and well-manned Public Distribution system (PDS) in place. This has to happen because



not enough attention has been paid to storage, preservation, processing, and proper distribution of food in the country leading to enormous quantities of foodgrains lying waste in various godowns throughout the country

### **Procurement, Storage and Distribution**

The main reason responsible for the wastage of foodgrains and other food items is the absence of adequate storage, post-harvest and processing facilities. Added to this is the failure to replace the old and outdated policies adopted earlier for the procurement, movement and stocking of farm produce when India was still suffering from scarcities of food supply. This failure has resulted into serious administrative and fiscal lapses both for the Union Government and the States. It is high time that new policies should be evolved and adopted for the interest of the farmer, the consumer and the Government. The first and foremost step should be, to have a fresh look at the Essential Commodities Act 1995 and to restructure the Food Corporation of India with a view to decentralize the system of procurement and distribution of foodgrains and ensure the availability of food to all the genuine poor beneficiaries who are Below Poverty Line (BPL).

### **Productivity Improvement**

There are challenges facing India now with the liberalization of world trade in agriculture under the World Trade Organization (WTO) trade regime. Agriculture is one of the areas in which India has an inherent strength to dominate the global market. But the country cannot effectively address this issue without urgently removing the many bottlenecks in its own food management. A major challenge before India is to reduce costs and raise the productivity and quality of agricultural produce to global standards.

In the long run, productivity increase has to be seriously considered as the possibilities of expansion of farm area are minimal except the region stretching from Eastern Uttar Pradesh to Assam. In the rest of the country where an expansion is an impossibility, future increases in production have to come essentially through major improvements in productivity. For these improvements to take place, there is need to remove the obvious constraints comprising:

1. Scarcity of Power,
2. Inadequate Irrigation Facilities and
3. Poor Rural Infrastructure.

The removal of these constraints should be followed by:

1. A significant increase in Science and Technology Inputs,
2. Improved Extension Services and
3. Raising the Educational Levels of the farmers.

I have referred to the importance of capital formation in agricultural productivity. It is very disheartening to observe that Indian Agriculture is starved of capital and, in recent times, both public and private investments in agriculture have been going down. This calls for the need on the part of the Union and State governments to prudently utilise the available limited resources more prudently and efficiently especially for capital formation. This should be invariably supplemented by the attractive Government policies to encourage private investment in agriculture especially in extension services.

### **AGRICULTURAL DIVERSIFICATION**

It must be the aim of agricultural development to diversify the rural economy. The development of activities allied to agriculture would tremendously contribute to the diversification of agriculture. There is also the need to develop rural industries based on agricultural outputs. The diversification would not only lead to higher incomes and employment of the rural population but would also result into even self-sufficiency and exportable surplus of agricultural



produce. I would only like to talk briefly on Crop Diversification and Rural Infrastructure.

### **Crop diversification**

The strategy in India has been to raise foodgrains confining to two crops only, namely, wheat and rice, leaving aside other cereals and crops, the production of which remains stagnant for the last many years. India would do well to change its strategy in crop diversification to attain self-sufficiency in many items of agriculture produce.

But I would like to refer straightaway to one attractive area of diversification i.e., Horticulture. The Union Government has recently mooted a Technology Mission for Integrated Development of Horticulture in North Eastern Region. The Region is very fortunate and its people are expected to take full advantage of the Mission's Programmes right from the start. If the goals of the Mission are achieved at every stage, there is no doubt that the North Eastern Region would convert itself into a National granary of horticulture produce with the potential to export these produce to other states in the country and abroad.

I have referred to the region stretching from Eastern Uttar Pradesh to Assam which has the potential of productivity increase if some more effort and use of nutrients are adopted. Assam is already poised with the possibility to generate surplus foodgrains. The one lakh shallow tube wells scheme under the Samariddha Kishak Yojana (SKY) implemented by the state, has almost revolutionised the production of rice expected to break all past records with the farmers facing the problem of lack of space for storage. With the brightening scenario of Assam in foodcrop production, the Hills States surrounding it can go all out for horticultural development.

### **Rural Infrastructure**

The entire rural infrastructure has to be refurbished to make rural activities viable. The Union Government has an ambitious plan to achieve Universal Rural Connectivity before 2007 through the National Rural Road Project. Besides rural transport facilities, minor irrigation works are to be built through public sector investment. Both these components of infrastructure will help the exploitation of waste and fallow lands accounting for more than 60 percent of the cultivable land in the country. The increase in productivity could be achieved even in less fertile regions through better irrigation facilities, access to farm inputs and storage facilities. The Food for Work Programmes if intensified, would not only help in better food distribution but also in creation of durable rural assets.

I am sure we are all aware that the Union Government has recently created a corpus fund known as the Rural Infrastructure Development Fund (RIDF) with an initial amount of Rs.2,000 crore. The RIDF has now grown to a massive Rs.23,000 crore. The fund is to be utilised for building of roads, bridges, communication, irrigation, drinking water supply, flood control, health, education, etc. These are the basic needs of the rural areas and the N.E. Region comprising mostly of rural areas would stand to benefit if the IRDF is fully implemented.

But there has been very poor disbursement to the N.E. states from this fund. This has happened despite the Ministry of Finance, Home and NABARD holding several meetings with State Governments of the Region to prepare necessary Project Reports for utilizing the RIDF. It is very disheartening to know that the N.E. States have failed to draw or utilise funds from RIDF.

### **CONCLUSION**

Both agricultural diversification and building of rural infrastructure would create demands in rural areas for more specialised agro-processing, more sophisticated trading and repair services and more professional education, health and personal services. They would also mitigate the excessive rural-urban migration that has been witnessed by the slums and shanty towns in various cities. A prosperous agriculture is therefore the only determining factor for jobs

for the rural poor.

The North Eastern Economic Association has done well by selecting the most pertinent Theme for discussion in its IV<sup>th</sup> Annual Conference-cum-Seminar being held here today and tomorrow. I look forward to a very fruitful discussion of the various aspects of the Theme namely, *Agricultural Transition in the Hills Areas of North Eastern Region*. I am sure the findings and recommendations of the Seminar would attract the attention of the Governments of the North Eastern States and their planners and policy makers. The six areas which the Association has proposed to discuss are very much relevant to each state. While the Economic Reform Policy of the country has been directed toward Liberalisation, Privatisation and Globalisation, the Public Sector has still to play a leading role in accelerating the pace of development in the North Eastern Region. And, for this to happen, a responsive Government has to keep in mind the welfare of the masses.

Thank you.

#### References:

1. Collin Clark's Paper in A. N. Agarwal and S. P. Singh (ed.) *The Economics of Underdevelopment*.
2. Quoted from the Prime Minister's Speech at the Conference of Chief Ministers on *WTO and Agriculture and Food Management*, held in New Delhi on May 21, 2001.
3. United Nations Fund for Population Activities Report 1999.

#### CONCLUSION

It is clear that the development and building of rural infrastructure would create demand in rural areas for more professional training and repair services and more professional education. The Government should take steps to meet this demand by providing more professional training and repair services and more professional education. The Government should also take steps to meet the demand for health and nutrition services. A responsive government is therefore the only determining factor for jobs.



## INAUGURAL ADDRESS

**SHRI E. K. MAWLONG**

*Chief Minister of Meghalaya*

It gives me great pleasure to be present here this morning at the Inaugural Function of this two-day Conference on "Agricultural Transition in the Hill Areas of the North Eastern Region" organised by the Shillong College in collaboration with the North Eastern Economic Association, Guwahati and I heartily congratulate Shillong college for taking the initiative to hold a Conference of this magnitude and stature on an important theme that concerns both the intelligentsia and the common people. I do hope that the deliberations through the various sessions will suggest measures to bring about rapid agricultural development in the hill areas of the Region.

The North Eastern Region is renowned for its rich bio-diversity and possesses rare species of flora and fauna. This region is also home to a wide diversity of common food crops including cereals, vegetables, ground spices, cotton, jute, mandarin oranges and other citrus fruits. The genetic variability of tropical, sub-tropical, temperate fruits and of many other crops and plants including ornamental, medicinal and aromatic plants, cane and bamboo is also large in the Region. These contribute considerably to the production of improved varieties of food crops but they also represent untapped opportunities for commercial exploitation.

The Region especially in the hilly areas is dominated by tribal communities, which are small, close-knit and generally comprising several clans, with little social stratification within the community. Strong feelings of community prevail at the clan and village level and are manifested in community cooperation in social and economic pursuits. However, the tribal economy is characterised by a lack of specialisation in production as each family produces or gathers almost everything that is required for day-to-day needs. Shifting cultivation, which is commonly known as 'Jhum' remains the mainstay to their livelihood. It is a very old system of agriculture practice with the people shifting their fields in cyclic rotation after cropping for two years, after which the land is left fallow for many years. This fallow period earlier used to be 15 to 20 years, but because of pressure of land and population, the jhum cycle is now reduced to 5-6 years or even less. This system of crop cultivation has contributed to a large extent on wanton destruction and deforestation of natural forests leading to progressive degradation of land and water resources.

It is heartening to know that over these years, the government agencies in the region have made sincere efforts to combat this destructive agricultural practice of Shifting Cultivation in order to preserve and improve the ecology and the environment. A number of development schemes have also been implemented to provide an effective support base for permanent settlement of the jhum families. Though these efforts have not completely weaned away the people from jhum cultivation, it is evident that agricultural transition has taken place towards settled agriculture using the improved and modern techniques of cultivation. I trust that this Conference of eminent scholars and experts of related fields will come forward with more concrete suggestions on this vital aspect so that the government agencies and people's organizations can look forward towards their implementation.

In bringing about Agricultural Transition in the Hill Areas of the North Eastern Region, it is also important to understand the local farmer's circumstances and the local farming system. Though tribal farmers have never attended any institution or university, yet they have a vast and extraordinary sound knowledge about plant and soil qualities. They know exactly when to plant, and how to plant in the right season to reap rich harvest. We see in Jaintia Hills district of Meghalaya the "Bamboo drip irrigation" system in which betel leaf crop planted with areca nut is irrigated with water tricking down from bamboo pipes. Therefore, the agricultural farming systems suitable for the hills should be worked out through a combination of the various systems in an integrated approach. These systems strengthened with subsidiary sources of income through animal husbandry or fishery provide opportunities for optimum realization of the potential that exists in the hills areas.

I am glad that the government intends to observe the year of the farmer from September 2001 to August 2002 to prove our commitment and priority to the farming sector, and I think this Conference has come at an appropriate time. I wish this Conference a grand success and I am confident that with joint efforts, the overall productivity in the region will rise to higher levels to keep pace with that of other areas in the country.

I now declare the two day Conference on "Agricultural Transition in the Hill Areas of the North Eastern Region" open.



## VOTE OF THANKS AT THE INAUGURAL FUNCTION

**Shri B. Syiem**

*Secretary  
Organising Committee*

It is a great pleasure for me to stand here amidst this august gathering to offer my sincere thanks to all the members present in this Inaugural Function of the Fourth Annual Conference of the North Eastern Economic Association on "Agricultural Transition in the Hill Areas of the North Eastern Region".

I stand here on behalf of the Organizing Committee to express my deep regards to Shri E. K. Mawlong, Hon'ble Chief Minister of Meghalaya who has kindly consented to be the Chief Guest and to inaugurate the Conference. Thank you Sir, for your kind presence. We've really feel inspired and encouraged to see you here and for the enlightening speech that you have just delivered.

We are also grateful to Dr. P. M. Passah, Vice- President of North Eastern Economic Association who has taken the trouble to prepare the Key Note Address. Dr. Passah has rightly pointed out on the need to diversify the rural economy and to build up the rural infrastructure for ensuring an enhanced job opportunities and to mitigate the rural urban migration thereby promoting the balanced development of the region. Thank you very much Sir.

I would also like to thank Dr.(Mrs) K. Lyngdoh, Pro-Vice Chancellor, North Eastern Hill University, Shri W. L. Lyngdoh, I.A.S., Director, Community and Rural Development and Shri K. L. Tariang, Director, Soil and Water Conservation who inspite of their busy schedule, could find time to be here amongst us.

We are thankful to the various departments, institutions and individuals who have sponsored this Conference and all its requirements without which this function could not have been possible. These sponsoring agencies are Planning Department, Government of Meghalaya, North Eastern Council, National Bank for Agriculture and Rural Development, Indian Overseas Bank, State Bank of India, Ka Bank Nongkyndong Ri Khasi Jaintia, Meghalaya Co-operative Apex Bank, Rapsang Group of Industries, Shri Victor Kharkongor, Community and Rural Development, Govt of Meghalaya and a few others.

My sincere thanks also goes to all the delegates, resource persons, invitees and distinguished guests for their kind presence making this function a grand success.

Our thanks goes to the Directorate of Information and Public Relations for giving us the public address system without which it will not be possible to hold this function.

Lastly, I shall be failing in my duty if I do not mention the names of the President and members of the Governing Body of the College, the Principal, teaching and non-teaching staff and the Students' Union and all its members for offering their invaluable help and support making this Conference a success.

Once again I offer my sincere thanks to all the distinguished guests, invitees, delegates and the members present in this Inaugural Function.

Thank you.



## VALEDICTORY ADDRESS

Shri P.J.Bazeley, IAS

*Principal Secretary to the Government of Meghalaya,  
Planning & Finance Departments*

**M**adame Chairperson Dr.(Mrs) M.P.R.Lyngdoh, Principal, Shillong College; the Hon'ble Chief Guest Shri A.H.Scott Lyngdoh, Finance Minister, Meghalaya; Distinguished Fraternities of Shillong College and the North Eastern Economic Association; Learned Participants; Ladies and Gentlemen –

It gives me immense pleasure to associate myself with the Seminar on 'Agricultural Transition in North East India'. I am indebted, indeed, to the Distinguished Organisers for their very kind invitation and opportunity to share a few thoughts on this vital aspect of our regional economy.

Today, we stand at the dawn of a new Century of hope and promise. It is therefore appropriate for you to have spent the last two days in introspective deliberation on the extent of transition of agriculture in our region. The Twentieth Century witnessed unparalleled transition of the social, economic, political and scientific milieu of mankind. In a sense, the world emerged from a 'world of want and drudgery' to a 'world of plenty and ease'. Nevertheless, the majority of fellowmen in the developing world in general, and South East Asian Uplands including the Uplands of North East India in particular, continue to be largely dependant on primordial agriculture for their survival. May I therefore, sincerely felicitate the Shillong College and the North Eastern Economic Association for having chosen the 'Agricultural Transition of the North East' as the focus of this Seminar.

At the commencement of the twentieth century, 'Jhumming' or the 'slash-and-burn method of cultivation' characterised the bulk of agriculture in the uplands of the North Eastern Region. The dense foliage covering the uplands of the region, enabled jhumming to be carried out on the same piece of land for two to three years. Limited population enabled jhummiyas to move to virgin unjhummed areas, every third or fourth year. The jhum-cycle thus covered a fifteen to twenty year period, enabling once-jhummed areas to regenerate enough vegetative growth to sustain fertility for the next round of jhum cultivation. Available records reveal that jhum cultivation had, by then, degraded not more than ten per cent of the region's vegetation and landmass, and yielded a productivity of around one metric tonne of foodgrains, mainly paddy, per hectare.

Fifty years later, at the time of disintegration of the British Empire and the emergence of our country as a sovereign, socialist, democratic republic, our population had multiplied, the jhum cycle had reduced to a ten to fifteen year period, the same piece of jhum land could not be cultivated for more than two years at a stretch, and jhum cultivation had by now degraded about fifteen per cent of the region's vegetation and land mass. It's yield had reduced to 0.6 to 0.7 metric tonnes, per hectare. The National and Provincial Governments, rightly accorded high priority to a new Jhum-Control Programme and a large number of Schemes were launched to wean away Jhummiyas to sustainable and permanent methods of cultivation.

Under National and Provincial patronage, the National, Regional and State Research Organisations and Centres including the Indian Council of Agricultural Research, more particularly its' North Eastern Regional Complex laboured extensively to discover and develop suitable technologies for improved sustainable dry-farming in upland areas. Over the last five decades, these Organisations and their research efforts registered some success, but alas, their achievements largely remain confined within their own hallowed portals, since the much required mass transference of technology is yet to take place. Development of improved local robust methods for sustainable regeneration of dry upland agriculture seems to be the only alternative. Our Institutions of Agricultural Research and Excellence and the State Organisations are yet to cut the Gordian-Knot and make sustainable upland dry-farming a reality. We can only hope and wish that the on-going efforts of the ICAR and the Regional and State Research Authorities will soon be able to accomplish this difficult task.



In the meantime, available regional records reveal that the closing years of the twentieth century witnessed a reduced jhum-cycle of six to eight years, with twenty-five to thirty per cent of its 'land mass' having been degraded by jhum-cultivation. The productivity of jhum lands has also fallen to less than half a metric tonnes per hectare. Significantly, five decades of national and provincial effort have succeeded in checking further increase in the number of Jhumia-households in the region, but the number has remained more or less constant. For example, in Meghalaya the number of jhumia families have remained at slightly over fifty thousand, over the last five decades, but over twenty-five per cent of our land-mass have been degraded by jhumming.

All said and done, jhumming, however unsustainable, is a way of life of our region's indigenous upland people. Unfortunately, our efforts to transform and improve jhumming have not made the required headway. It is therefore necessary to improve existing robust cultivation methodologies with improved and sustainable technologies, to transform weaknesses into strengths and challenges into opportunities. Unless this happens, agricultural transition will continue to allude the uplands of the north-eastern region.

Today, the craze, everywhere, is for 'natural or health foods', which are essentially grown organically without the use of inorganic fertilisers. For rice-eaters the world over, who can afford, scientifically packed 'ORGANIC RICE' is the craze. It is understood that the total world production of 'organic rice', mostly in neighbouring Thailand, does not exceed ten thousand metric tonnes, annually. The retail international price of organic rice – many times the price of the famed 'Basmati' rice – is around forty US Dollars per kilogram. Truly, a low productivity but high value commodity.

It is in this context, that we need to look inward into our so called agricultural 'weaknesses' or 'challenges'. Our jhum rice, *Meghalaya produces over thirty thousand metric tonnes per year; North East India cumulatively produces over a hundred thousand metric tonnes, per year*, is essentially grown on organic fertilisers obtained from the open incineration of cut and dried green foliage. Our jhum rice and other jhum produce are the products of a primitive agricultural process, free from contact with inorganic fertilisers, of any sort. *Can our Agricultural Scientists determine the organic status or otherwise of our jhum produce, particularly jhum-rice?* If found to be organic, can we put in place a globally creditable and acceptable phyto-certification authority to authenticate the organic status of our jhum-rice and other jhum-produce? If found otherwise, can our Agricultural Scientists evolve agricultural technologies and methodologies to stabilise and sanitise dry-upland farming or jhumming, to ensure that its' produce are 'natural' or 'organic'. Once done, our primordial method of jhumming, if stabilised, will emerge as a tremendous agricultural strength and transform the agricultural economy of the uplands of our region. We would have capitalised on 'a weakness'. We would have overcome 'a challenge'. A true transition of our upland agriculture would have occurred.

At this point, it is worth to note that we have sought to bring about similar transition in other sectors of Agriculture, too. Our tea-growers have experimented with cultivation of organic tea. Their produce is being exported to Australia with good rate of returns. Similarly, our local off-season vegetables and mushrooms, mostly grown on organic fertilisers, fetch a much higher unit rate in the local markets than similar vegetables grown inorganically and brought into the State, from other places, for retail sale.

Any discussion on the transition of agriculture in the North Eastern Region will be incomplete without bringing out the significant changes that have occurred in our low or wet-land agriculture, during the last fifty years. Traditional perennial agriculture has given way to irrigated agriculture. Around one-half of the region's irrigable lands have already been irrigated. Mono-cropping has to a considerable extent been replaced with multiple cropping. The use of fertilisers and pesticides have been popularised and the region's per hectare consumption of these inputs have crossed the half-way point of the all-India average level of consumption.

In our efforts to transform Agriculture in Meghalaya, we encouraged the cultivation of off-season vegetable during the late eighties and early nineties. Today, we produce over two-and-a-half lakh tonnes of off-season vegetables, each year.



Similarly, we popularised the cultivation of maize and tomatoes, ginger and turmeric. Today, we have considerable marketable surpluses of these products, exceeding a hundred thousand metric tonnes.

The North East Uplands have tremendous horticultural potential. At our instance, the Central Government, recently, formulated and launched the 'Horticulture Technology Mission for North East India'. This Mission will, if properly implemented, considerably transform the agricultural including horticultural macro-canvas of the region and help generate economic self-sufficiency of the masses.

Traditionally, agriculture included animal husbandry, veterinary, dairy and pisciculture. Not too long ago, these activities were patronised, developed and supervised by a single department of the Central, as well as, the State Government. Likewise, most agriculturist, more particularly the upland agriculturist of the North Eastern Region continue to practice a bunch of agrarian activities which include agriculture, animal husbandry, dairy and pisciculture. However, inspite of it's rich potential for all types of agrarian activity, the region is yet to experience an agricultural transition of any sort, in so far as these activities are concerned. One can safely infer that there has been little or scarce transition in our understanding and exploitation of these time-tested and time-honoured household activities, over the last fifty years.

It is therefore, hardly surprising that much of the region's requirement of fish, eggs, poultry, dairy, pork and mutton continue to be met by imports from other regions, more particularly from Southern India. Consequently, it is necessary for Opinion leaders of our Upland Society, Research Scholars and Scientists, Policy Planners and Administrators to get together to resolve existing hurdles and problems leading to the present impasse. We need to more fully tap and exploit our agricultural potential, to generate employment and resources for the accelerated economic emancipation of our poor, more particularly, our upland poor.

Yet another grey area on the agricultural canvas of the Uplands of the North Eastern Region, relates to land holdings. In the past, much of upland agriculture was carried out on family owned or on village or community allocated lands, to which the cultivators had free and unquestioned access for such times as they chose to cultivate same. Unfortunately, the construction of an expansive road-network has opened up hitherto inaccessible rural areas, more particularly agricultural areas. This accessibility has enabled, town and city dwellers to have easy access to the rural areas with their new found town and city-based wealth. The inevitable has happened and ownership of increasingly large tracts of cultivable agricultural lands has passed, through sale and purchase of such lands, to town and city dwellers, reducing the erstwhile cultivators to the status of share-croppers. This in turn has resulted in the loss of will and capacity among the actual cultivators to invest to improve the quality, the technology and the methodology of agriculture.

Such transition in the pattern of land ownership has adversely affected the standard and sustainability of agriculture in many areas of the region. The erstwhile concept of 'zamindari' appears to have returned through the backdoor. Consequently, it is imperative for society to consider creating better awareness of the ills of this emerging trend of absentee-landlordism and to mobilise public opinion in favour of legislation to pre-empt this socio-economic malaise.

We need also to take note that wherever a Green Revolution has taken place, the intervention of informed and educated agriculturists has played a significant role. In our own country, the phenomenal achievement of Punjab in agriculture is in no small way, the result of educated and well trained agricultural graduates and engineers returning to the rural areas, for taking up modernised and scientific agriculture as their profession. These well educated young men and women, who were adequately versed in the agricultural or life-sciences, were not interested in etching out a comfortable urban living for themselves. They did not pursue employment under government or the private sector. They preferred hands-on-living in the midst of the pristine gifts of mother nature, in the midst of their rural roots. They adopted and adapted technologies and made them harmonious with robust ground realities. The result - *mother nature responded with the blessings of abundant and plentiful harvests*, and Punjab experienced unparalleled economic resurgence. A Green Revolution had occurred.



Unfortunately, this has not been true for the Uplands of the North Eastern Region. Our young men and women who have got themselves educated in the agricultural and life-sciences have not returned to their grassroot habitat. They have got themselves adjusted in organised employment. While they contribute to the implementation, supervision and management of agricultural and life-science field programmes, they do not have a direct hands-on contribution to agriculture or life-science for their livelihood. Consequently, actual cultivation, animal and crop husbandry, dairy, pisciculture, etc., are left to the uneducated and technically untrained Uplanders, who are guided and depend on their sixth sense, rather than on systematic training and technical know-how. The result, very little transition has taken place in the agriculture of the Uplands of the region, till date.

Fortunately, the organised sector in the north eastern region, including Government and PSU's are no longer capable of absorbing qualified agricultural graduates and engineers. The time has now come when our agricultural graduates and engineers will have to seek other avenues of gainful employment. One of their options will be to return to their grassroot habitats and to take up modern, scientific agriculture, dairy, animal and crop husbandry, pisciculture et al. As and when that happens, agriculture in the north eastern region will take a major leap forward. The process of agricultural transition will attain a significant milestone and the region will be on its way to sustainable economic growth.

Half a century ago the socio-economic setting and agricultural status of Upland China was fairly similar to that of the north eastern region, today. But that is history. The agricultural and socio-economic transition of the Upland areas of the People's Republic of China is to a very large extent due to what has come to be known as the 'Bamboo Revolution'. Much, nay all wastelands, more particularly all degraded lands of their Upland Region have been brought under scientific bamboo-cultivation and management. Bamboo is their major cash crop. In a sense it is their crop of crops. The Upland Chinese relish their bamboo cultivation, as much as any other form of agriculture. And why not? Bamboo beginning with bamboo-shoots and ending with state-of-the-art finessed bamboo laminates reach the world over, reaping endless Dollars for the Upland Chinese, enabling them to live with dignity in the midst of whistling and bounteous nature. That is truly the revolution, every agriculturist, every cultivator, every individual can yearn for.

We in the north eastern region are surrounded by endless ranges of degraded hillsides, degraded as a consequence of jhumming. Can, we too, bring them under 'Bamboo'? If we succeed, we would have done it for posterity. The transition - *agricultural or cultivational* - will have arrived and a comfortable, an echo-friendly and a sustainable future ensured for the region.

May, I now leave these thoughts for the continued consideration of the galaxy of distinguished scholars and economists gathered here, this evening. May it be possible for some of these thoughts to mingle with the treasure of opinion generated at this Seminar, for ushering in an agenda for change, somewhere, someday.

I thank you all for your gracious consideration and patient hearing.

I wish the process initiated by the Seminar every success.

Thank You, Jai-Hind.



## CONVENER'S REMARK

Shri B. Syiem

Secretary, Organising Committee

Madame Chairperson, Dr.(Mrs.) M.P. R. Lyngdoh, Hon'ble Finance Minister Shri A.H. Scott Lyngdoh, who is the Chief Guest of the occasion, Shri P. J. Bazely, Principal Secretary, Government of Meghalaya, Prof. M.N. Singh, all the delegates, invitees, teachers, students, ladies and gentlemen. I stand here on behalf of the Organising Committee to say a few words in this concluding session of the two day Conference on "*Agricultural Transition in the Hill Areas of the North Eastern Region*". First of all, I would like to express my sincere thanks to the North Eastern Economic Association for selecting our College as the venue thus, giving us the opportunity to organise this Fourth Annual Conference of the Association which is indeed a great and wonderful experience on our part.

Friends as you all know, agriculture is the backbone of the economy of the North Eastern Region where more than seventy percent of the population depends on it for their livelihood. Despite this fact, the region is still deficit in foodgrain production and the contribution of the agricultural sector to the Region's Domestic Product is not commensurate with the number of persons employed in it. This shows that the sector is still in a state of backwardness characterised by obsolete methods of production, undeveloped means of transport and communications and other infrastructural and social bottlenecks which pose a problem to the rapid growth and development of the Region as a whole. The country has witnessed the occurrence of the 'Green Revolution' in the late sixties which led to the increase in the production of foodgrain thereby making the country almost self-sufficient. But it is disheartening to note that, even after a gap of more than three decades, the benefits of the Green Revolution is yet to make its impact felt in the Region's economy. Therefore, in the light of the prevailing economic scenario the theme of the Conference is highly relevant and most appropriate for academic discussions as well as policy implications.

We have divided the theme into six sub-themes comprising of (i) *Status of Jhum cultivation* (ii) *Prospects and problems of Horticulture and Plantation crops* (iii) *New trends in cropping pattern* (iv) *Animal Husbandary* (v) *Land tenure and land relations* and (vi) *Geography specific farming*, but due to some constraints, we were able to discuss only the first four sub-themes. Altogether there were seven sessions including the Inaugural Session, Annual General Body meeting of the Association and the Valedictory Function, apart from the four business sessions.

During the two day Conference, 21 papers were presented on the above mentioned sub-themes covering in fact, all the states of the North Eastern Region. I shall now give a brief summary of the discussion taken up, during this two day Conference. Shifting cultivation which is an age-old practice and a way of life of the hill people is an issue that was thoroughly discussed and highlighted by most participants. Though this primitive form of agriculture is associated with various evils like low productivity, deforestation, soil erosion, siltation of rivers and ecological imbalances, yet it remains to be the sole occupation of the hill people. As pointed out by some authors, though the area under jhum cultivation has increased over the years, the yield has increased only marginally. This is due to the fact that, jhumming is being carried out with the help of traditional knowledge and practices thereby leaving little scope for higher agricultural production. This state of affairs also depicts the failure of government policies and programmes announced from time to time in tackling the problem of jhum cultivation. As a solution to this problem, various suggestions were made both on a short-term as well as long-term basis. In the short run, there is a need to improve jhumming for enhancing productivity through the provision of better inputs and modern technology. But in the long-run, jhumming has to be stopped since it is not viable economically as well as otherwise. Various alternatives like horticulture, animal husbandry, tea and rubber plantations etc. has to be thought of, depending on the nature of the area concerned. Programmes like education, training, awareness and motivation have also to go side by side and in this connection the role of the NGOs has to be given priority, apart from the leading part played by the government machinery.



But most important is the provision of infrastructural facilities such as good roads and communications, irrigation, power, etc., because, without providing these services, any schemes of jhum control is bound to have a limited impact and can never be really successful.

During the last decade the hill areas of the North Eastern Region has also witnessed certain changes in the cropping pattern. Though rice is the principal food crop grown in the Region, yet of late, there has been a shift to other crops such as tea, horticulture, rubber, oilseeds etc. Such shift in cropping pattern is deemed necessary taking into account the socio-economic problems of the Region such as low productivity, unemployment and poverty. In fact, these new areas of agriculture have a vast scope of development in the region due to its natural characteristics and potentialities and can also help in restoring ecological balance which has of late been threatened due to deforestation, increasing mining and developmental activities etc.

Another area that was discussed was on Dairy and Animal Husbandry. This is also an area where there is tremendous potential for development in the North Eastern Region due to its favourable climatic conditions and the food habits of the hill people. At present, the production from livestock and poultry is quite low compared to other states in India, but the demand for meat and meat products is very high that every year a good quantity of livestock is being imported from outside the Region to meet the excess demand. Moreover, the per-capita availability of meat, eggs and milk is still below the international recommended norm. For example, in Meghalaya the daily availability of milk per head is only 75 ml as compared with the recommended requirements of 350 ml per head per-day. These facts reveal that, there is a tremendous market for these products in the region, which if properly tapped through the development of this sector will surely generate employment opportunities and at the same time lessen the pressure on demand.

The North Eastern Region is considered to be one of the most backward regions of the country even after five decades of developmental planning. However, the region is not deficient in terms of resources. It is equally endowed with natural and human resources. But owing to various constraints and bottlenecks, these resources have not yet been properly tapped, thus leaving the region is under-developed. This calls for urgent policy action by the government through various programmes of public investment with major emphasis on provision of basic infrastructural facilities.

The two day Conference on *Agricultural Transition in the Hill Areas of the North Eastern Region* has been successful in the sense that it has been able to address the basic issues confronting the agricultural sector in the region and at the same time offer concrete steps for the redressal of these problems. All the four business sessions were highly interactive. The delegates participated with a high degree of zeal and enthusiasm. Most of the papers presented were very good and of high quality. We do hope that the findings and recommendations of the Conference will be quite useful for the policy makers and planners serving as a reference in their task of formulating and implementation of the various programmes and policies of the government.

We have tried our best to organise the Conference in a befitting manner. In case of any inconveniences or shortcomings, we do apologise to you all. Our efforts will prove to be successful only if these suggestions and recommendations are accepted and put into practice by the government, institutions and individuals concerned with the development of the region's economy.

Thank you.



## VOTE OF THANKS AT THE VALEDICTORY FUNCTION :

**Dr. S. K. Gupta**

*Head Deptt. of Chemistry, Shillong College*

Madame Chairperson Dr. (Mrs.) M. P. R. Lyngdoh, Hon'ble Chief Guest Shri A. H. Scott Lyngdoh, Shri P. J. Bazely, Prof. N. M. Singh, Distinguished Guests, Delegates, Participants, Ladies and Gentlemen.

On behalf of the organisers of the Conference and the North Eastern Economic Association, it is my proud privilege to sincerely thank you all for your kind presence, patronage and co-operation towards the successful completion of our Conference on "Agricultural Transition in the Hill Areas of the North Eastern Region".

We are extremely grateful to our Chief Guest this afternoon, Shri A. H. Scott Lyngdoh, who has always been very kind to us and stood by us in any meaningful endeavour we approached with him. We owe our deep gratitude to him.

We are very grateful to Shri P. J. Bazely, Principal Secretary, Government of Meghalaya for his most illuminating valedictory address.

Shri P. J. Bazely was also an honorary member of our Advisory Committee in the last two National Conferences on -

1. "Development of Science and Technology in the last 50 years in India with special reference to North Eastern India" held on 27-30th May 1998.
2. "Pollution, Man and Environment" held on 15th and 16th June 1999.

He has always inspired us with his active presence, valuable suggestions and most helpful guidance. We are thankful to you Sir.

We sincerely thank all our distinguished guests, Chairman of different business sessions, Resource Persons, Rapporteurs and Delegates present on both the days representing various organisations of different parts of North Eastern Region without whose participation and co-operation, this Conference would not have met the success it has.

We sincerely thank Prof N. M. Singh of Manipur University and Prof. P. M. Passah, Vice-Presidents, Dr. Gopal Bordoloi, Secretary, Dr. M. P. Bezbarua, Treasurer and the executive Committee Members of the North Eastern Economic Association for giving us the responsibility of organising the Conference together with their support.

It is our duty to gratefully acknowledge that this Conference was mainly possible because of the financial and material support of Planning Department, Government of Meghalaya, North Eastern Council, Indian Overseas Bank, State Bank of India, Department of Community and Rural Development, Government of Meghalaya, National Bank for Agriculture and Rural Development, Meghalaya Co-Operative Apex Bank, Ka Bank Nongkyndong Ri Khasi Jaintia, Department of Soil and Water Conservation, Government of Meghalaya, Rapsang Group of Industries, Mr. Victor Kharkongor and Mr. W. Lyngdoh. We appreciate their gesture with gratitude.

We are very grateful to the Media both regional and national level, A. I. R Shillong, D. D. K, Shillong, D. I. P. R. Government of Meghalaya, P. C. N and others for their wide coverage of our plans, programmes and various sessions.

The Teachers, Staff and Students of Shillong College feel rewarded for their hard work and dedicated service they rendered towards making the whole exercise more successful.

The Shillong College Management as well as the Principal and Chairperson of the organising committee Dr. (Mrs.) M. P. R. Lyngdoh has been a source of constant guidance and inspiration.

Members of Shillong College Academic Society worked hard for a common cause shoulder to shoulder with others.

On behalf of the organisers, I sincerely extend my hearty thanks and gratitude to each one of you present here and others whose help and co-operation made it possible to hold this conference meaningfully and successfully.

Thank you.



## ROLE OF THE MEDIA AND AGRICULTURAL TRANSITION

**Shri J. B. Chakraborty,**  
*Deputy Director (Trg)*  
*RTI (P), AIR, Shillong*

People with primitive or faulty knowledge of agriculture have special needs. They have to be properly understood and convinced. Media professionals have a special role to play while focusing attention on various issues concerning the transition of agriculture in the hilly areas of the North East. In this regard it will be interesting to note that a noted agricultural scientist, Dr. William Gaud of the United States, Department of Agriculture has come to be associated not only with the higher production through enhanced productivity but also with the several negative ecological and social consequences. Thus from this, it is clearly understood that agricultural transition has not only the positive aspects to its credit but also its minus sides if the implementation is a faulty one.

### **Guide Lines For Media Professionals Covering Agricultural Programmes.**

- Use simple words and stress clarity and active participation.
- Farmers in the hilly region of the North East should be invited and they may be utilised in the programme.
- Radio/TV programmes should be subtitled.
- Make the main message easily available and stress repetitions with jingles in an interesting format.
- Present before the farmers their skills and achievements. Selection of both male and female farmers having wide range of interest in agricultural development through transition need to be focused.
- The farmer's field needs to be photographed with the change of technology adopted e.g. Jhumming to Terrace Rice Cultivation/ Wet Rice Cultivation, etc.
- Misconception about transition with lesser yield having less production need detailed analysis through the experts & the farmers after field trials.
- The farmers unequipped with the modern gadget or inputs need not be related with the productivity.
- Farmers with inadequate use of agricultural inputs may reflect upon adaptability to various agro-climatic conditions.

### **Misconceptions, The Media Persons Must Avoid**

- Farmers with lesser knowledge are not worthy of contributing to media programmes.
- Farmers with temporary knowledge are more in developing countries than the developed countries.
- Inadequate production committed by faults and failure is all wastage.
- Farmer's necessity cannot be compared in terms of their past living.
- Agricultural transition is not the agricultural development having several negative effects on ecological & social consequences.



## AGRO-BASED INDUSTRY IN MEGHALAYA

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Meghalaya is one of the constituent units of Indian Union which came into being initially as an Autonomous State on the 1<sup>st</sup> April, 1970. After a lapse of 1 year 9 months and 21 days, the State was elevated to the full fledged status on the 22<sup>nd</sup> January, 1972. The emergence of Meghalaya 29 years ago was nostalgically an important landmark in the history of the State. That event was the result of the momentous peaceful agitation of the ethnic people of the then United Khasi and Jaintia Hills and the Garo Hills to achieve their separate identity in the political map of Indian States. These two Districts were economically backward and that had obviously made the people to aspire for better well-being and desire to determine their own socio economic fortune with their own genius by having a separate State. This new State was entirely encumbered with multifarious economic problems and was left to Government to guide the people for attaining desirable social and economic aspiration for a better standard of living.

The state of economy was comparatively backward where the rate of literacy was only 29.49% in 1971 and the per capita income was only Rs. 538 in 1970-71 while that of all India was Rs. 663 during the same period. In this context, one of the indicator of economic growth of the State is the State Domestic Product or State Income. Agriculture is considered as the main stay of the people, but it was not traditionally organised as an industry. So the activity is mainly concerned with marginal subsistence of the bulk of the population. Therefore the motivation, by and large was to produce enough in order to satisfy the minimum requirement of the family. Added to other difficulties, is the old method of shifting cultivation, which initially could create agricultural surplus but subsequently diminished in fertility and less output, and left but a barren soil or become no longer suitable for agriculture. The picture gradually changed from one period to another with the increasing population.

The primary sector which comprised agriculture, livestock, forestry and logging and fishing as the economic activities is waning from year to year in the contribution to the State Domestic Product. This is mainly due to the rise of service sector, while industry is very shy in the State. As the majority of the people are depending on agriculture, the setting up of agro-based industry in the State is the need of the hour. If agro-based industries could be set up at the block levels, the influx of rural folks to urban areas for employment could be checked. Though the State is not self sufficient in food crops and depending on the supply from outside, yet industries on agricultural and horticultural products could be started.

According to land utilization statistics for the year 1993-94, the total crop area in the State was 238488 hectares and went up to 262630 hectares in 1998-99 showing the increase by over 11%. As far as the net area sown is concerned the figures recorded 201221 hectares in 1993-94 and increased up to 244445 hectares in 1998-99. The statement below shows the area and production during 1993-94 and 1998-99 as a comparison for the period of five years.

According to the above statement, the scope of agro-based industry in respect of food grain is very dim due to the fact that the State of Meghalaya is not self sufficient in food crops and had to depend on import from outside the State. However the scope for agro-based Industry in respect of fibres namely cotton, jute and mesta could be started in Garo Hills where such crops are being grown. As regards spices, there is enough scope to start industries at the small scale level due to the availability of crops like chillies, turmeric and ginger. These oilseeds are being imported from outside the State as finished products. Due consideration is therefore required if industries are to be set up with local raw materials. The potentiality of Agro-Based Industry shows a very healthy scope for initiating industrial set up in respect of potatoes. The production of potato increased from 119138 MT in 1993 - 94 to 201059 MT in 1998 - 99. In this regard, the whole output of potatoes with a small portion of home consumption is mainly sent to other States. The production of areca-nut in the State has increased from 9440 Mt to 11567 MT. In addition to home consumption dry areca-nut can also be produced as an industry in the State.



### PRODUCTION OF IMPORTANT CROPS

|     | 1993-94      |               |        | 1998-99      |               |
|-----|--------------|---------------|--------|--------------|---------------|
|     | Area (Hect.) | Production MT |        | Area (Hect.) | Production MT |
| 1.  | Foodgrains   | 131867        | 149334 | 132993       | 186782        |
| 2.  | Oilseeds     | 8101          | 4714   | 9219         | 6120          |
| 3.  | Fibres       | 16604         | 60661  | 16471        | 54058         |
| 4.  | Sugarcane    | 85            | 229    | 83           | 225           |
| 5.  | Chilies      | 1739          | 1073   | 1764         | 1051          |
| 6.  | Tobacco      | 760           | 525    | 742          | 507           |
| 7.  | Turmeric     | 1348          | 1784   | 1375         | 6997          |
| 8.  | Potato       | 17689         | 119138 | 20753        | 201059        |
| 9.  | Areca nut    | 8771          | 9440   | 9585         | 11567         |
| 10. | Soya bean    | 918           | 876    | 899          | 812           |
| 11. | Ginger       | 6670          | 41837  | 7403         | 45590         |
| 12. | Fruits       | 15411         | 100479 | 32088        | 193773        |

The climatic condition of the State is very suitable for growing of fruits. As such, fruit preservation industries could be started in right earnest.

In addition to agriculture, livestock is one of the sub-sectors of the agricultural economy where industries could be started for the production of hide and skin. This is possible due to the presence of non-vegetarian population in the State. The production of hide and skin in the State holds a very optimistic scope for setting up a Tanning industry. The following statement furnished the data on production of hide and skin.

### PRODUCTION OF HIDE AND SKIN

| Year    | Hide (in Nos.) | Skin (in Nos.) |
|---------|----------------|----------------|
| 1993-94 | 174720         | 107775         |
| 1998-99 | 191932         | 122429         |

In order to supplement to the consumption of meat, canning factory of livestock and poultry can also be started.

Sericulture is one of the economic activities that has been in existence even before Meghalaya came into existence but no was taken to make it as an important industry of the State. It is observed that production in respect of sericulture raw materials had increased between 1993 - 94 and 1998 - 99 as shown in the table in next page:

## PRODUCTION OF SERICULTURE

|                           | 1993-94 (Kg.) | 1998-99 (Kg.) |
|---------------------------|---------------|---------------|
| 1. Mulberry               |               |               |
| (a) Reeling cocoons       | 8880          | 12742         |
| (b) Raw silk              | 634           | 182           |
| 2. Eri                    |               |               |
| (a) Cut cocoons           | 205054        | 311545        |
| (b) Muga cocoons (in Nos) | 6414000       | 7612000       |

The area under forests records 938454 hectares during 1993 - 94 and increase to 950000 hectares in 1998 - 99. Varieties of trees are available in the forests of the State and wood based industries were functioning successfully till the ban on cutting of trees is made by the Supreme Court of India. However, industries on bamboo and bamboo products still hold a good promise to the rural people in the form of cottage and small scale industries.

As stated earlier, the shyness of capital for setting up of medium and large scale industries in the State is more a reality than a dream. This is due to the fact, that absence of railway lines is a bottle neck for industrial progress. The State at present has only one medium industry, namely the Mawmluh-Cherra Cement Company. Opening up of industries with materials from agricultural sector would be a blessing to the rural people.

The number of registered manufacturing units in Meghalaya connected with agro-based industries was 6 in 1993 - 94 and such units increased to 12 during 1998 - 99. The agro-based industries under un-registered manufacturing category contributed Rs. 8154 lakh in 1993 - 94 as gross value of output to the State income and contributed Rs. 14916 lakh in 1993 - 94.

The above information are representative of the pace of development in the State. It therefore, requires a more radical transformation both quantitatively and qualitatively at the level of planning processes. The scope of employment in government services appears to have reached a saturated point. In order to cope with present un-employment crisis and to improve the economy of the State and the standard of living of the people, agro-based industrial policy would have to be thought out with sincerity.



## THEME OF THE CONFERENCE

The theme of the two day Conference-Cum-Seminar held on the 7<sup>th</sup> and 8<sup>th</sup> September, 2001 in the Shillong College, Shillong in collaboration with the North- Eastern Economic Association was : *Agricultural Transition in the Hills Areas of North-Eastern Region.*

Agriculture is the mainstay of the economy of North-Eastern India. But the agrarian sector is still technologically backward especially in the Hills States. Successful structural change through the process of agrarian transition in the region would take time because of political, social-cultural and financial constraints. Since the region is a food deficit area, the theme is suitably relevant for academic discussion in the Conference-Cum-Seminar. Policy prescription has to be formulated both on short-term and long-term basis.

With the food grain production being short by 2 million tonnes of the total demand in the region and with the low poverty level, the issue calls for urgent consideration.

The following sub-themes were split up for separate discussions :

1. **Status of Jhum Cultivation :** Problems of Jhum cultivation have been discussed elaborately at various levels during the last few decades. But information about the present status of jhum cultivation is not readily available. It will be worthwhile to analyse the present status of this primitive type of cultivation in the Hill area of North-Eastern Region.
2. **New Trends in Cropping Pattern :** With improvement in communication and expansion of market economy, the hill farmers have started cultivation of commercial crops. These new trends in cropping pattern is another area worthy of detailed analysis.
3. **Prospects and Problems of Plantation and Horticulture :** Horticulture and Plantation are the two main sectors which have been encouraged in the emerging cropping patterns in the hills. Though prospects of horticulture and plantation crops are well appreciated, there are several problems which need to be sorted out. These problems and prospects, therefore, need to be reviewed in the light of farm-level experience.
4. **Land Tenure System and Land Relations :** With economic development taking place along with agricultural transition, land relations and land tenure systems may require revision. The required changes in such systems and relations need to be discussed in the context of agricultural transition in particular.
5. **Dairy Farming and Animal Rearing :** These are also emerging farming activities which can greatly enhance household income and employment and need to be discussed and disseminated.
6. **Geography Specific Farming in the Hills :** In planning for agricultural development in the hills, the geography of different parts of hills, say, upper and lower slopes need to be taken into account. That is why geography specific farming is an important aspect of any discussion on transition in hill agriculture.



## HORTICULTURAL AND PLANTATION CROPS IN MEGHALAYA

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### ABSTRACT:

Agriculture constitutes the core sector where 80.37 percent of the population resides in the rural areas. The provisional census figure 2001 shows that out of the total population of 22.91 lakh, agriculture occupied 22.30 percent, agricultural labour 5.04 percent, marginal workers 2.35 percent, other workers 12.82 percent and non-workers 57.33 percent. The contribution of the work force to the State gross domestic product has shown a considerable decline even against the character of its rich diverse state of agriculture which suits with the characters of both tropical and temperate climates. The rural sector provides a predominant and variegated base of food production and production of other essential commodities which are vital to our existence. The state has to go ahead in combating food shortages and developing other suitable agro-base industries which should yield increasing returns.

The State's total production of foodgrains and other essential items do not look to be proportionate with the increasing rate of population. Moreover, nothing has been done towards installing modern food processing industries although the State possesses the necessary requisites towards that direction. The State still depends heavily on imports in respect of foodstuffs and other essential commodities. Hence, the work force has to be enhanced in agriculture and allied undertakings to raise the level of production.

Constraints to an enhanced crop production have been caused by the restricted trade with Bangladesh, absence of communications with the accessible part of terrain, absence of irrigation facilities at dry places, extent of rural indebtedness, high transport charges, unstable prices offered to farmers etc. With the setting up of The Mawiong Wholesale Regulated Market in 1998, it is hoped that it will lead towards accelerating the rate of productivity of crops, provide a better means of regulating trade transactions, offer scope for developing suitable grades of food processing and fruit preservation units and provide effective protection to crops under cultivation against assaults of insects and several rigours caused by uncertain climatic conditions.

The rural population in view of its large numbers has to be provided with resources sufficiently to promote agriculture linked up activities and extension of a variegated pattern of farming in which improvement of efficiency of small and large farm management is extremely necessary. Of course, in respect of individual holdings, fragmentations in the sizes of land are unavoidable as affected by the issue of succession and inheritance. Lands held jointly may also pose problems to improving the standard of maintenance and operation.

The continuous mining operations in the state have brought about deforestation on a large scale, soil erosion and loss of organic fertility. Therefore, the process of land reclamation for the purpose of a settled agriculture and procuring the proportionate output of the soil's produce should continue over a period of time. Havocs caused by floods and disruptions of communication which have taken place seasonally, have further affected partially the raising of a minimal level of output causing such farmers at places to remain impoverished continually.

Here we seek to inculcate that agriculture in its overall domain extends also to pasturage, sericulture, pisciculture and craftsmanship. Waste of pasturages and livestock generally domesticated, yield the highest grades of natural manure which help considerably to increase the yields of the soil. Natural manure used separately or side by side with chemicals are resorted to, to fertilise the soil. Natural manures help to quicken the increased yields of the soil, agriculture integrated with pasturage has urged upon us to intensify the use of livestock, partially to provide manure, and partially to cater to the increasing demand of meats at markets and to lay down a necessary infrastructure for boosting dairying. Our State falls short and can hardly yield even half of the size of daily requirements of meat, milk, eggs and their by-products.



The local sericultural farms have also been coping with production cocoons graded as tassar, muga, eri and silk but hardly with a highly adequate weaving and textile infrastructure. Soil conservation under the heading of jhum control and watershed development programmes have secured innovations conducted scientifically in linking up agriculture with vital sectors thereby, reducing constraints to soil erosions. Water conservation, irrigation management and development of cash/horticultural crops have yielded more concrete results in increasing the number of crops undertaken recently based on soils suited to germination and growth.

**Farming** as much as its condensed meaning bears, implies 'a highly conventional or organized system of cultivation or pasturage possessing the necessary assets in the shape of equipments, expertise and other things in a regularly acquired tract of land held either in perpetual possession or a lease system. Farming has its more comprehensive significance because it includes a host of activities in pasturage, sericulture, pisciculture and weaving. Agriculture, basically and intrinsically, is allied with the similar system of farming. Horticulture means the application of the highly developed arts and techniques of agriculture and seems to infer a specialized pattern to carry out the more sensitive kinds of operation for improvement in the field of agriculture.

Because of the obvious reasons, I believe that this conference has been organized with the view to assess some of the conspicuous drawbacks and at the same time offer some remedial measures towards – a) accelerating the rate of productivity of major and minor crops in the variegated field of agriculture, b) to find out better means of regulating trade transactions and motivate the farmers to increase the margins of profits, especially those placed at remote places constrained with several rigours and sometimes the uncertain weather and inferior soil conditions and against the difficult means of communications to afford them, therefore, all the possible protection against undue exploitations and harassments, c) to explore or otherwise offer scope to develop the more suitable pattern of agro-based factories viz. food processing and fruit preservation, dairying, craft items, handloom weaving, textile works, canning and other allied activities and ensuring proportionate and viable returns in these items, d) to ensure the more scientific preservation of easily perishable items and preventing farmers from disposing them at thrown-away or very insecure prices, which are suicidal to the constant labours and exertions, put by the farmers into the soil and e) provide effective protection to the crops under cultivation against the assaults of pests and insects and several rigours caused by the uneven character of climate and soil conditions, disruption of communications and other adverse effects.

According to the provisional census report 2001, the total population of the state is 23, 06, 069 in the proportion of 18,53,457 and 4,52,612 comprising the rural and urban sectors respectively. The sex ratio stands at 972 in the rural areas as against 975 in the general list. The number of towns has increase from 12 to 16 in 2001.

The State is passing through a heavy process of transition in which a few vital points furnished below are so essential for us to bear:

1. The growth of townships other than the earliest district headquarters, viz. Tura and Jowai besides the State headquarter has not been sustained proportionately. This is because indications are faint on any conspicuous growth of commercial centers properly upgraded and availing the modern facilities in a right perspective: a few towns have served as the viable roadside stations.

2. Agriculture is still the principal and pre-dominant sector. Agriculture has still its distinct place in comparing with other activities conducted in villages which may consist of quarrying and mining, cattle rearing, carpentry, craftsmanship, construction and other trades. There are other activities of a minor tertiary character which have arisen.

3. Urbanization recently has worked out to 62 per cent in the State, but the heaviest concentration has shifted to Shillong, the State headquarter, and in smaller proportions to other district headquarters and centers, which may or may not have sufficient scope to intensify the variegated activities, unless a sufficient infrastructure is created for carrying out the further fresh and feasible projects.



4. In spite of the heavy rate of urbanization, it is a paradox that agricultural production during the period 1995-96 to 2000-2001 has shown gradually increasing trends in terms of several items of produce- both traditional and modern.

The 2001 provisional Census figure, showed the proportion of the following grades of population against the total population numbering 23.06,069 lakh persons –

|                           |       |                |
|---------------------------|-------|----------------|
| a) Cultivators            | ..... | 22.30 per cent |
| b) Agricultural labourers | ..... | 5.04 per cent  |
| c) Household industry     | ..... | 0.16 per cent  |
| d) Other workers          | ..... | 12.82 per cent |
| e) Marginal workers       | ..... | 2.35 per cent  |
| f) Non-workers            | ..... | 57.33 per cent |

5. The provisional Census figure of 2001 gives a break up of the population in the ratio of 80.37 rural and 19.63 urban provides the following indications –

a) that the rural sector should provide resources to promote agriculture linked up activities and extension of a variegated pattern of farming, b) that more community mindedness be boosted among the backward villagers especially in inculcating the principles of self-reliance c) that intensive farming is unavoidable in view of the frequent fragmentations of land caused by the law of succession and inheritance in respect of tiny land holdings.

Non-workers in whatever census return appear to have occupied a largest proportion of total population. Household industry looks also to be merge while the number of marginal workers form an almost insignificant segment of population. Non-workers at many instances seems to include house keepers, students and children and have the least or nothing to contribute to productivity.

A review on the traditional pattern of agriculture is indispensable in which the proper nomenclatures have been briefly provided below –

Rep sung and Rep hali – which infer a wet-rice cultivation concentrated in extensive valleys, narrow basins and short terraced grounds being confined also on bases of shorter hills and stretching out into flat level lands near about: Rep Pynthor – this refer to wet-rice cultivation confined in lower grounds distinct from larger valleys: Thangram or Shyrti Khlaw – is a heavy shift-and-burn system of cultivation or jhum pattern: Rep Syllai – provides a system of extraction of light herbage for procuring a kind of manure: Rep Lyngkha – this is a more crude form of cultivation which is applied regularly or irregularly: Rep Bri – this is a cultivation, regular in character which distinctly applied to orchards and spice cultivation of various kinds confined to the southern border: Rep Kper – is a homestead gardening: Rep Rnem – this is a pattern which usually involves a heavy system of digging and hoeing.

In a historical perspective, the Garos mostly practise shifting cultivation till the attainment of statehood in 1972. Jhum cycle normally intervened between six and nine years, depending on local soil conditions. As among the Khasis and Jaintias jhum is more confined to ridges: it is a rotative system of cultivation in which the soil accommodates operations for two to three years only. It involves a heavy jungle felling which causes top-soil erosions easily and extinction of some organic power of the soil including its other most valued ingredients. Yet, although experts suggest that it is highly disadvantageous since it exhausts quickly the fertility of the soil, the local farmers admit that it is the only applicable system in the undulating terrain, and they have no other to sustain their way of living although they are more impoverished. Among the Garos, paddy, maize and millet are the main crops although admixed with tapioca, gourds, arum plant, dioscorea, onion, leaf mustard, garlic, brinjals, sweet potato etc. Cotton plantation intervenes at the latter months. Harvests, therefore, intervene between July and February. The first broadcast of seed is done more out rightly after the jhum are fired. Second broadcast is done more neatly in dibbling the seeds into apertures prepared.



The earlier report indicates that the little valley between the hills are very carefully cultivated and yield the richest crops of planted rice, the hill tracts when cleared are cropped with cotton, rice, chillies and yams which give the most abundant returns. A.J. Mills reported further that "the Garos are an energetic, industrious people, the forest producing timber of all kinds many of them valuable and supplying bamboos, grass and fuel to the districts round" (Report on the Province of Assam, reprint 1980). Playfair reported that "cotton is sold at every twenty markets" situated all along the border, and at Tura. During the cold winter months, it is sold unginned, but in March and April "the cleaned article is brought to market." (Monograph, the Garos first printed in 1909). Playfair was thinking that the annual outturn was 60,000 maunds in which unginned cotton was sold at Rs. 7 per maund minimum and that of ginned cotton as high as Rs. 27 per maunds. "The greatest part of the crop is exported to Germany." Again, the 'sale of lac is also a source of considerable profit' to the Garos, in which total output of lac exported in 1904-05, was estimated roughly at 6,986 maunds.

Garos markets in the hills and along the border held weekly, performed the transactions in which cotton, ginger, chillies etc. were bartered with cows, fowl, rice and dried fish. In 1942 Jobang D. Marak legislator in the Assam Legislative Assembly pointed out that thousands of maunds of cotton collected at Tura, Baghmara, Garobadha, Dainadubi, Romenagar, Bajengdoba had required the services of the ginning machineries to facilitate better returns of profits and also to avert exploitation upon the local farmers by Malwaris. He also pinpointed the potentialities existing in Garo Hills for muga and endi rearing; he pressed further upon availing better means of communications for the transport of bamboos lying unmoved in a huge magnitude. He implored upon withdrawing the restrictions usually imposed by Akhings or Nokmas against the extension of paddy cultivation in the valleys by enterprising farmers in which these constraints had affected the economy to a large extent. Benjamin Chandra Momin M.L.A. insisted on the completion of road constructions such as part of Bajengdoba road, Garobadha-Halli-Laleyganj and Mukhdnagra-Rajabala roads and also building two bridges along the Tura-Mankachar road and renovations of Tura-Phulbari, Tura-Damra roads. Garo Hills appeared even in 1970 to offer bright prospects for the development of plantation crops, fruits and vegetables.

Agriculture in the rest of the State is marked by its variety, 'Rep Shyrti' and 'Rep bun' in fact accommodate the admixed cultivation of varied crops grown mostly in rotation and which pertain to the different seasons in a crop calendar. The different soil and climatic conditions have made shift-and-burn systems still more varied. In fact some crops have two or three seasons in a year. Homestead gardens should be treated of separately because they provide the regular feature of a small-scale cultivation. Jhum mostly implies a suitable single crop grown in a field replaced in the next year by another crop or a combination of a few akin crops in both cases. Rep bun constitutes a shifting system although in its more modified mode. 'Rep syllai' is a dry system of potato and sometimes maize cultivation. 'Bun system' in general accommodates a host of items, viz. potato, ginger, maize, soya beans, cucumber, melon, chillies, radish, turnips, cabbage, cauliflower, sesamun, gourds and others. Buns normally hold cultivation for three years, and the bun cycle thereafter works to eight or even ten years.

The system widely differs between temperate and sub-tropical zones marking a difference in altitudes. Buns offer a marked contrast because somewhere, spring time paddy thrives in them, whereas elsewhere winter paddy stays mostly. With regard to shyrti or thang ram, on the north they plant the paddy at the first year replaced by kachu at the following year, and in the next year they replaced it by errandi seeds. Potato is the main produce during the summer although phan tlang or winter potato is known to prevail. Rice, a basic cereal, represents a hill variety which grain pertains both to swamp and dry rice cultivation which thrive at the central plateau and extending to the foothills adjoining the plain. Imported seed, besides the indigenous, have been adopted more widely.

Tapioca species are represented by phan khlaw, phan shyneh, phan mluh and phan dieng. Yam and kachu appear to contain a large portion of starch and herbaceous ingredients. A tuber soh phlang and soh liang appear to represent a gymnospermous specie. Job's tears is a kind of coix-lachrymai. Finger millet, fox tail and Italian millet till the last century was more abundant. Typical beans are rymbai ktung and rymbai ja which looks like soya beans.



Output of turmeric from Jaintia Hills is also considerable. Ginger has two grades- ing makhir and ing bah. Long pepper and bay leaf (tez pata) are the important sub-tropical products. Onion and garlic are mostly confined to homestead gardens. Vegetables of market value, apart from those mentioned, are squash, khol-khol, egg-plant, tomato, freash beans, flat beans, lettuce, lady's finger, carrot, beats, kerela, capsicum and others, besides a host of wild herbages.

Limes and lemons is a variety composed of myngngor (pommel), soh jew, myndong, niang riand, soh khyllung, soh bah, soh long and soh mad

. Citrus mainly are soh brab (perhaps passion fruit), pears, papaya, pyrus khasiana, pyrus begeta (soh shur), litchi, local cherries and berries, guava and others. Output of jack fruit seems to be quite considerable.

Temperate fruits are sohphoh klong, grapes, peaches, plums, apricot etc. which thrive well in and around Shillong. Garo Hills are known for banana plantation. There are grapes of plantain which include dwarf cabandish, cheni champa (kait syiem, Jo-ji, kait jrong) and others. They are also important items of produce. Plantation crops that are of considerable importance are areca-nut and betel-vine. It has been extremely difficult to compress all the details for want of time and space.

Groups of agricultural commodities pertaining to summer and autumn seasons are shown in a table below which have been serialized by the Department concerned, this is for fixing prices of such commodities in market –

- a) Vegetables – tomato, carrot, cabbage, cauliflower, turnip, radish, fresh beans, beet, root, capsicum, brinjal, pumpkin, cucumber, bottle gourd and squash.
- b) Spices and condiments – ginger, garlic, turmeric, chillies – green and powder, black pepper and onion.
- c) Oil seeds, sesamun and soya beans.
- d) Roots and tuber crops, potato – special, large and small.
- e) Pulses – peas, grams, rajma.
- f) Fruits – temperate – lagoon, Himalaya cherry, peaches, plums, cabandish, napsti (pear); tropical lemon, pineapple, jack fruit, guava, cabandish, chini champa, pine-apple.
- g) Plantation crops – areca-nut and betel-vine.

Bulk of the above except rajma form the parcel of the local produce at Shillong. We cannot confine ourselves to traditional crops only. We have to take note of non-traditional items which are of considerable importance.

The variegated crop production does not look to be proportionate with an increasing rate of population. The State still depends heavily on imports from outside in respect of essential commodities such as salt, sugar, vanaspati etc. some of which are transacted through public distribution system and others through several private concerns. The State export a host of items like fruits, vegetables, spices, fibres, and plantation crops, yet, cross trade on double traffic lines seem still to be unavoidable.

In public distribution, over 483 thousand tonnes of foodgrains were indented by the Union Government in 1992-93 along with an excess off take of 495 thousand tonnes on subsidy burden by the State amounting to Rs. 24.75 crores for 978 tonnes of that commodity.

In 1998-99, total quantum of rice produced by the State is 1.50 lakh tonnes. Total quantum of foodgrains was 1.87, maize 0.25, cotton 0.5, ginger 0.46, rapeseed and mustard 0.4, potato 2.01 and citrus fruits 0.7 lakh tonnes.

Total output for the year 1997-98 were meesta 21,558, sweet potato 16,978, maize 24,854, tapioca 2,10,78, wheat 6,894, total oil-seeds 5,167, banana 6,30,11, dry chillies 1,108, total cereals 18,40,86, papaya 3,980, sesamun 686, areca-nut 12,071, total pulses 2,467, jute 34,683, other cereals 2,237, turm 6,367, soya beans 804, pineapple 80,404, sugarcane 225, castor 16 and tobacco 505 tonnes. Total cropped area has then exceeded to 2.15 lakh hectares: net sown area and area sown more than once were shown at 0.44 and 2.59 lakh hectares respectively (W.L.Lyngdoh,



The following few points are of obvious importance –

Advanced treatment of mushrooms should be scientifically processed into spawns with button and oyster grades thereby raising its quality in market transactions.

Turmeric if it possesses six per cent of rich curcumin can have considerable scope for circulation.

Potato produced in the State if it accounts for the highest yield per hectare in India should have scope for more formidable entries into trade transaction and in which potato preservation should have its large role to engage a large number of persons.

As regards maize, apart from the indigenous grade, a project if implemented for the development of citrus fruits including papaya and pine-apple in particular and root crops such as sweet potato and tapioca can considerably help to solve the unemployment problem to a certain extent. This would require a more effective attention of the experts and in the long run can sustain the principles of self-reliance to a greater extent.

Some selected Garo soils are known to yield some high grade of wheat, paddy and some horticultural crops. We may also include other items such as mesta, rapeseeds, oil seeds, jute, broomsticks and others.

MECOFED for the last few years, has supplied some items of minor forest and agricultural produce which mainly include mesta, jute, cotton, agro-products and other minor products. But during recent years, it has to depend heavily on the subsidized assistance of the Government which means that it has not succeeded constantly to deliver the goods with confidence.

Mawiong wholesale regulated market which has started in 1998, possesses 22 traders' stores and 20 retail outlets are expected to be added. Besides, a more scientific system of preservation through cold storage, have been proposed for installation.

Crops allotted to the Commercial Crops' Development Board appear to include cotton, rubber, black pepper, coffee, tea, turmeric, betel leaf and areca nuts. We have come to know that cashew-nut plantations have shown very encouraging results.

Soil Conservation Schemes have been carried out stage by stage under three headings – Jhum Control, Watershed Development Programme and Soil Conservation Schemes in general. Under each category again are included terracing to reclamation, afforestation, water conservation and distribution works, cash/horticultural crops' development, and erosion control works are also conducted under Soil Conservation Schemes and Watershed Development Programme.

Till 1999 there are three experimental centers viz. Thebronggiri, Riango and Umsning which facilitated supply of green tea. The only tea factory which was started more recently is Nalari located at Mawsyntai.

Cultivation (in view of 80 per cent of population residing at villages) should have scope for further expansion on more active scale with regard to both traditional and scientific farming. The variegated system has considerably become linked up with similar programme conducted by soil conservation and similar sister establishments in which the on-going forest plantations and afforestation schemes are conducted. Agricultural activities have their wide range. In a seminar held by Bri Hynniew Trep movement on June 28, 1997, I have pointed out that enhancement of agricultural activities leads to the enhancement of traditional blacksmithy products (mohkhiew, side, wait) used as traditional implements and several baskets, tray etc. (kriah, shang, polo etc.) as recipients and storages of crops produced. The seminar opines that agricultural produce in terms of scientific management and preservation including sauces, spices



– powder etc. remains still to be considerably focused. Increased production of cabbage, tomato, mushrooms, arums and others should give an increased weightage to farming in a variety in such soil in which they thrive best, and in the development of tea pat, spices, horticultural plants (areca nut and betel vine) and sub-tropical variety, besides which farming (in whatever respect – rotatory, intensive, extensive) needs constant treatment to enhance the quantum of output and effectively protect the plants against pests. Rubber and cashew-nut plantations should also receive further impetus. The allied system of sericulture, pisciculture, cattle, poultry and piggery farming, craftsmanship, floriculture and bamboo plantations are intimately connected with agriculture. Some of these by virtue of natural inclination are connected with the processes of aromatic, pharmaceutical and a host of other manufactures, although agriculture in its overall domain is still traditionally oriented.

The Meghalaya Parliamentary Forum in September, 1999 among other things, have opined to aim at food self-sufficiency through an increased agricultural, horticultural, piscicultural, animal husbandry and plantation crop production and are bent upon promoting large scale production through an intensified sericulture. In June last year a consensus of opinion was framed, which among other things, evoked new aspirations to utilize the maximum resources for implementation of development programmes: to streamline the Public Distribution System and enhance agricultural production, to enrich the traditional sector of weaving under the coverage of sericulture, to provide potable drinking water and protect the environment under a joint forest management. I have also opined that economic upliftment programmes can be taken at hand with the issue of environmental preservation.

A thorough review indicates the following points which are of relevance to the Conference –

Lands held on kinship or community basis pose obstacles to the system of individual ownership which is crucial in context of a changing scenario. In other parts of the State, dwindling sizes of land holdings are frequently occurring affected by succession and inheritance issues. Fragmentation of lands, generation to generation, however, cannot be avoided. Land fragmentation therefore, poses a problem to cater to growing population. Rural sector is the dominant production base and the main stay of agriculture, food production and other jobs or grades of activity. Hence, “to tackle the problem is to improve the efficiency of small farm management.” (W. Laso published in “Khasi Cultural Society Souvenir & Conspectus 1988” Journal 3rd series).

Some of the retrogressive factors which have mainly led to the disappearance of agricultural tracts are intrusions caused by heavy quarrying and mining of limestone and coal. Heavy soil erosions and deforestation have stayed after the effect of heavy mining and practices of shifting cultivation which have occurred and recurred through the ages.

Owing to the cloud of social ignorance and non-acceptance of improved variety and techniques diminishing returns from the land has constantly prevail. Rich outturns of the soil have been sabotaged, in spite of the fact that National Watershed Development project has been implemented over eight micro-sheds spread out over 4,000 hectares of land. The deleterious factors have been affected, since the period of jhum cycle has greatly been reduced from 3 to 5 years in western and 1 to 3 years in eastern Meghalaya respectively. Flaws in inheritance and land tenure have constrained the running of a few prospective agro-based factories. Facilities for extending irrigation into the drier catchment areas are very poor. Occurrences of floods and other severe natural ravages have also led to the stagnation of farming for some time and have brought about heavy reverses upon the continuous productive pattern.

A lot of educational propaganda is constantly required in respect of saturated seed treatment, soil testing laboratory, integrated pest eradication management, grading of manures such as green and organic types, rock phosphate etc. which are mostly encompassed within the policy of the Directorate concerned. Assets for availing the services of fruit and agricultural research stations more effectively still remains to be created.

The types of irrigation which should be suitable are conveyance of water through flow irrigation, drips and sprinkle which require services of pump-sets and showers and digging deep tube wells. I have opined that the matter



of using fertilizers and chemicals in lieu of natural manure should be properly assessed, so that this process should not lead to destruction flora and fauna and aquatic life. The matter of procuring any suitable distribution of natural manure is linked up with developing the form of cattle wealth and rearing of livestock. Use of admixed natural manure and of chemicals purely cannot be totally avoided. However, due safeguards have to be taken to assess their deteriorating effects upon the soils.

It is, therefore, essential to suggest the following measures for implementation –

- 1) to review the existing system of land management for small and joint holding and recommend for its daily efficiency drive in the system of horticultural and allied operation,
- 2) introduction of more effective measures for procuring more cattle waste for natural manure so as to increase the yields of the soil and to supplement daily requirements of our meat markets (as we depend heavily for meat shortages on imports). It would also greatly assist to process further dairying activities to a considerable measure. Pisciculture and rearing of livestock practices have their intimate linkages with enhancing agricultural wealth in its variegated system. Horticultural items, viz. muga, silk, errandi as also jute and cotton, broomsticks, lac, bay leaf, rape seeds and others have their natural inclination to be counted with agriculture,
- 3) to create effective measure to provide irrigation facilities at dry soils, to relieve the concerned Department of fund constraints and to ensure proper implementation of planned schemes
- 4) it is admitted at the Shillong Trade Fair 2000, that “fruit juice squashes marketed by the Agricultural Department of the State are second to none. In fact, these are freshly packed and carbonated, and besides, the locally produced fruit juices are available at much cheaper rates than those sold by multi-national companies.” Because of the above reasons, effective advertisements and publicity coverages are greatly essential in view of the heavy competitions caused by trade upsurges from outside. Publicity is needed not only for agro-based produce but also for a host of horticultural and spice items which offer high grades of quality at national and international markets,
- 5) Proper incentives have to be disseminated especially to our youths to take up co-operatives and entrepreneurial activities both in the agro-based as well as poultry, cattle, piggery farming as also in horticultural and pisciculture programmes,
- 6) Site and resource selections should be made fully viable which should not fail to yield increasing returns because recurrences of deficit budgets mean not only wastages of time, labour and money but offer very bleak prospects for raising the per capita and gross produce of the State.