

# **National Seminar on Sustaining Hill Agriculture in Changing Climate held at Agartala, Tripura**

Indian Association of Hill Farming was established in 1987 in Meghalaya under the umbrella of ICAR Research Complex for NEH Region, Meghalaya. The agriculture in the Himalayan states both in Eastern and Western Himalayan region has always been challenging because of the difficult terrain, poor accessibility, high rain fall, soil erosion, soil acidity, improper water management Jhum farming, absence of appropriate crops and planting materials, absence of improved / crossbred animals such as cow, pigs, poultry and goaterly etc and low adoption in modern animal husbandry and Fish Farming thus making the states behind the National production and productivity in various sectors of Agri – Allied Activities. The poor and marginal populace of Hills and Mountains are more vulnerable to climate change impacts than others. During the past 10 years the rice production being the staple food in the NE region increased by 21.28 %, but the region still has large deficits in pulses, oilseeds, meat, milk and eggs. In order to address various issues of Hills and Mountains, a National Seminar on Sustaining Hill Agriculture in Changing Climate was organized by Indian Association of Hill Farming (IAHF) jointly with ICAR Research Complex for NEH Region at Pragna Bhawan, Agartala during 5-7<sup>th</sup> December '2015.

The programme was inaugurated on 5<sup>th</sup> December 2015 at Pragna Bhawan, Agartala by His Excellency, Hon'ble Governor of Tripura, Shri Tathagata Roy. The dignitaries present in the inaugural ceremony were Prof A. K. Ghosh, Hon'ble Vice Chancellor, Tripura Central University, Dr. G.S. G. Ayyangar, Principal Secretary, Finance, Agriculture and Rural Development, Govt. of Tripura, Dr. P. Das , Former DDG (Agri Extension ), ICAR, New Delhi, Dr. K. R. Dhiman, Former VC, YSPUH&F, Solan, Himachal Pradesh, Dr. U.C. Sharma, Vice President, International Commission on Water Quality and Dr. S.V. Ngachan, Director, ICAR Research Complex for NEH Region, Meghalaya and Chairman of National Seminar. Dr. M. Datta, Joint Director, ICAR Research Complex for NEH Region, Tripura and Organising secretary, National Seminar put forward a warm welcome to all dignitaries, delegates coming from various places of our country, Scientists, Directors of various Institutes, Joint Directors, State Officials, NABARD and Press & Media. His Excellency, Governor of Tripura had expressed his happiness in conducting the National Seminar by IAHF jointly with ICAR with a hope to come out recommendations for solving the problems of agrarian economy in Hills and Mountains. As enumerated by His Excellency, the conflict between Forestry and Agriculture should also be focused in a converging mood in a fragile ecosystem of Hills for producing more food grains with ensured supply to the people of Hills, largely dependent in Agri and Allied Activities. Soil Health cards were distributed among the Farmers of Tripura and Meghalaya by His Excellency, Governor of Tripura. A number of books, bulletins and scientific leaflets were

released by His Excellency, Governor of Tripura. Various awards such as IAHF Fellow, Best research paper, Best M. Sc and Ph. D Thesis etc were conferred upon Scientists. More than 200 delegates from different states of north east India and western Himalayas attended the National Seminar at Agartala. The possible role of ICT in Agriculture could have to be unraveled in this era of Information Technology as pointed by Prof A. K. Ghosh. Wishing a grand success in the National Seminar, Dr Ayyangar had informed the House a close collaboration existing among Govt. of Tripura and ICAR. The necessity of various adaptation and mitigation strategies is to be undertaken in the changing climatic scenario as stressed upon by Dr. P. Das. Dr. K. R. Dhiman had expressed a need to carry out a holistic approach to increase the production in Agri and Allied Activities. The achievements of ICAR Research Complex for NEH Region in recent times were narrated by Dr. S. V. Ngachan and the proactive role undertaken by IAHF was also informed by Dr. Ngachan in the inaugural function. The Inaugural function which was coordinated by Dr A. Sen, Principal Scientist, ICAR Research Complex for NEH Region, Meghalaya, came to an end with vote of thanks proposed by Dr. Anup Das, Secretary, IAHF and Convener, National Seminar.

Farmers – Scientists interaction was also organized under the chairmanship of Dr. P. Das, Former DDG, ICAR, New Delhi and Soil Health Card, Pheromone Traps were distributed among the Farmers. A number of research papers were presented either by orally or through poster display in different 12 Technical Sessions under various themes like

- Climate Change – Adaptation and Mitigation Strategies for Hills
- Farming System Approach for Natural Resource Conservation and Food Security ( Crop Improvement and Germplasm Management)
- Plant Health Management
- Livestock , Poultry and Fisheries in Agriculture
- Organic Farming and Natural Farming
- Improved Shifting Cultivation Practices
- Technology Dissemination
- Potentials of Horticulture in Hill Farming
- Animal Health Management
- Integrated Soil, Water and Nutrient Management
- Farming System Approach for Natural resource Conservation and Food Security ( NRM)
- Farm Mechanisation and Secondary Agriculture

The Plenary Sessions along valedictory distributing the awards were organized under the chairmanship of Dr. S. V. Ngachan with Dr. K. R. Dhiman as the Chief Guest. Dr. D. P. Sarkar, Director of Agriculture, Govt. of Tripura was present as Guest of Honour. The involvement of Scientists, Technical officers, Administrative officials and Project staff of ICAR, Tripura Centre was exemplary and with the untiring efforts of Scientists from Hq at

Barapani, the National Seminar was made a grand success. The recommendations as emerged from the deliberations are as follows:

## **Recommendations:**

### **Inaugural session**

'Zero Carbon – Zero Poverty' goal should be the motto with special emphasis on resolving the socio-economic issues of the farmers, skill upgradation of the students, information delivery system to the remote localities through ICT tools, post harvest management of perishable produce and arsenic toxicity in ground water etc related to the agriculture of the NE hill region. Competition for allocation of scarce land resources between agriculture and forestry may be addressed with suitable complementary technologies in order to provide both food security and ecosystem services to the NE region.

### **Farmers' scientist interaction session**

Fertilizer should be applied as per soil testing report. Control of fruit fly through fruit fly trap should be taken up in community scale instead of individual farmers' level to make it effective. Participatory seed production programme may be undertaken through farmers' participation to make the quality seed available to the farmers at cheaper price.

### **Technical Session –I**

#### **Theme: Climate Change- Adaptation and Mitigation Strategies for Hills**

1. To mitigate the untoward effects of climate change for conservation agriculture that will have an important role and needs to be promoted at every facets of agricultural activity.
2. Contingency planning for modified cropping sequence and integrated crop and pest management needs to be undertaken on urgent basis.

### **Technical Session –II**

#### **Theme: Farming System Approach for Natural Resource Conservation and Food Security (Crop improvement and germplasm management)**

1. KVKs from both the state governments and ICAR should help in registration of farmers varieties with PPV&FRA for economic benefits to the farmers.
2. Proper phenotyping/screening facility should be followed for developing successful stress tolerant varieties.

### **Technical Session –III**

#### **Theme: Plant Health Management**

1. Development and demonstration of location specific integrated insect pest management should be developed with special emphasis on eco-friendly management solutions for the north east hill agriculture.

### **Technical Session –IV**

#### **Theme: Livestock, Poultry and Fisheries in Agriculture**

1. Development and adaptation of livestock centric integrated farming model suitable for the altitude based on available resources.
2. Development of low cost and eco-friendly technologies for feed resources, feed conversion, housing and management of pasture. Explore the possibility of enhancing economic return from cow dug, draught ability and packaging.

### **Technical Session –V**

#### **Theme: Organic Farming and Natural Farming**

1. Laboratory facilities should be strengthen for organic farming practices.
2. Package of practices for organic farming should come to in practice with agronomy practices, integrated nutrient management be taken due attention.

### **Technical Session –VI**

#### **Theme: Improved Shifting Cultivation Practices**

1. Multipurpose trees, agro-forestry intervention should be practice in theme areas for soil and water conservation and improving soil fertility.
2. Application of 50% RDF and line of sowing across slopes are recommended for successful cultivation of improved rice variety.

### **Technical Session –VII**

#### **Theme: Technology Dissemination**

1. KVKs with the help of ICAR institutes and should prepare macro level climate resilience contingency plan for each district for successful adaptation to climate change in agriculture. Extension research needs to be refurbished for developing an effective decision making model for successful adoption of innovative climate resilient technology.
2. Climate resilient agriculture needs a holistic approach integrating different components like timely input support system, ITK based agricultural practices, ICT based weather forecasting,

agro advisory service, maintaining gaps & standard in agriculture, conservation of indigenous germplasms, innovative (Innovation for Agriculture and Training), eco-specific demonstration of technologies and imparting knowledge intensive and skill oriented training programme for the stakeholders to make it more sustainable.

### **Technical Session –VIII**

#### **Theme: Potentialities of Horticulture in Hill Farming**

1. Canopy management studies in horticultural crops for optimization of yield and recycling of biomass for beneficial uses need attention. Intensive studies for utilization of indigenous horticultural genetic resources for nutraceutical purposes along with ITKs for pest management be documented and validated.
2. Studies on honey bee as a pollinator as well as for honey production should be focused in NEH regions.

### **Technical Session –IX**

#### **Theme: Animal Health Management**

1. Development of a comprehensive animals and aquatic diseases surveillance system covering the Emerging transboundary, exotic, zoonotic and parasitic diseases including environmental contaminants particularly the heavy metals and its mitigation strategies.
2. Nanotechnology based herbal research needs to be promoted and strategies pertaining to strengthening the immune system of animal and aquatic animals needs to be build-up.

### **Technical Session –X**

#### **Theme: Integrated Soil, Water and Nutrient Management**

1. Furrow liming should come in practice in hill agriculture. Continuous monitoring of soil water and soil acidity should be done. Soil health card should be a complete soil health card that should include all physical and biological properties. One farmer should get soil health card only from one institute.
2. Studies on soil-plant-animal-human continuum should be continued.
3. Minimum tillage during Kharif followed by Zero tillage in Rabi should be followed for profitable production of green pea in rice pea cropping system in Meghalaya.

### **Technical Session –XI**

#### **Theme: Farming System Approach for Natural Resource Conservation and Food Security**

1. Utilization of wasteland for fodder production with good quality grass species, tree legumes are recommended for this region.
2. Intensification of rice based system with improved high yielding rice varieties and integration of pulses, oil seeds, vegetables, poultry, fish, pig etc for food and nutritional security.

## Technical Session –XII

### **Theme: Farm Mechanization and Secondary Agriculture**

1. There is a vast scope for farm mechanization in NEH states which not only reduces labour cost but also increases farm income. Hence more efforts may be made for inclusion of more farm Implements in hilly ecosystem.
2. ICAR may coordinate with Khadi Gram Udyog Board and AICRP on Honey Bee for establishing one full fledged center in the NE.



His Excellency, Hon'ble Governor of Tripura, Shri Tathagata Roy is lighting the lamp to inaugurate National Seminar on Sustaining Hill Agriculture in Changing Climate on 5<sup>th</sup> December 2015 at Pragna Bhawan, Agartala



The Director of ICAR Research Complex for NEH Region, Meghalaya, Dr. S.V. Ngachan is felicitating His Excellency, Hon'ble Governor of Tripura, Shri Tathagata Roy with a flower bouquet during inaugural programme on 5<sup>th</sup> December 2015 at Pragna Bhawan, Agartala





The Joint Director of ICAR Research Complex for NEH Region, Tripura, Dr. M. Datta is felicitating Prof A. K. Ghosh, Hon'ble Vice Chancellor, Tripura Central University with a flower bouquet



The dignitaries are sitting on the Dias during inaugural programme of National Seminar on Sustaining Hill Agriculture in Changing Climate on 5<sup>th</sup> December 2015 at Pragna Bhawan, Agartala



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( Source : ICAR Research for NEH Region, Tripura)