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S Dam Roy

Central Island Agriculture Research Institute, India

Agro-Biodiversity and its implication for feeding billions through its sustainable utilization: An overview in Indian context

Agriculture is believed to have originated about 10000 to 12000 years ago when man shifted from hunting gathering to permanent settlement with greater dependence on plants as a source of food. Population growth, changes in food demand, conversion to modern, high-input agriculture, land use changes, and the globalization of agricultural markets have caused rapid loss of agricultural biodiversity, and of biodiversity in wild land ecosystems. Despite the importance of biodiversity for agriculture, ecologists and conservation biologists have tended to place greatest emphasis on the negative agricultural impacts on wild biodiversity that have resulted from modern agricultural intensification and expansion. In fact, a contrast has arisen between agriculturalists and conservation biologists, due to the growing demand for food, creating a significant impact of agriculture on wild land ecosystems. Resolving this dichotomy is imperative, in order to conserve biodiversity for its highest potential benefit to agriculture and for the Earth's life-support system.

Diversity of life forms and their ecosystem have been vital to human survival. The earth's agro-biodiversity and its ecosystems, species and genes are product of 3000 million years of evolution. The agro-biodiversity or agricultural biological diversity is the backbone of a human kind for their food security since the time immemorial and it is yet a basis of economic development as a whole. The significance of agro-biodiversity is a highest and most valuable resources having the concerned for food, nutrition and environmental security by using these judiciously in a vital form. Agro-biodiversity includes all components of biological diversity of relevance to food and agriculture and components of all biological genetic resources that contribute to sustaining the key functions of agro-ecosystems. The agro-biodiversity can be defined as a variety and variability among plant species, animal species, fish species and microbial organisms on earth that are important for food and agriculture.

The first decade of the 21st century has seen increasing challenges for global food supply. Interconnected challenges, including climate change, energy and water supply, are further exacerbated by the financial and economic changes in an increasingly globalized world. As a result, it is unclear how the growing demand for food, fibre, and bioenergy (both biomass and biofuels) within a wider bio-economy can be met without further compromising ecosystem services on which all economic activities and social harmony depend. Since the agro-biodiversity comprises of an important set of genetic resources as it is the basis of a fundamental feature of farming systems around the world for food security. Understanding and enhancing the role of agro-biodiversity and the genetic resources and ecosystem functions it conveys is essential. Biodiversity underpins to food security, sustainable livelihood security, ecosystem resilience, coping strategies for climate change, adequate nutritional requirements, insurance for the future and the management of biological processes needed for sustainable agricultural production. A basic challenge to improving food security by capitalizing on agricultural biodiversity over the next few decades is to balance relevance and realism. While there are many possible ways in which agricultural biodiversity could improve food security, they may not all be feasible in all production systems or they may prove uneconomic or too labour intensive for adoption by farmers. New approaches based on increased reliance on biodiversity may fit uneasily with production practices based on continuing simplification of agro-ecosystems. Identifying what works in practice, taking into account regional differences and different scales of farming, as well as supporting change will therefore also be essential elements of using diversity to improve sustainability, and food security in the face of change. Successful approaches are likely to bring together positive aspects of sustainable intensification, to reflect the realities of small-scale farmers and to be supported by appropriate policy and economic frameworks.

Biography

S Dam Roy who is presently working as the Director, Central Island Agricultural Research Institute, Port Blair has got 30 years of Research and development experience, out of which he has served the Central Agriculture Research Institute, Port Blair, Andaman & Nicobar Islands for 22 years. During the period of his service at CARI, Port Blair, he has served in the capacity of Scientist, Senior Scientist, Head of Division and Principal Scientist. For a brief period he has also served as the Head of Division of Aquaculture in the prestigious Deemed University called Central Institute of Fisheries Education, Mumbai. His area of research interest is the Ecological studies on Island Ecosystem particularly on Mangrove Ecology as well as Coral Ecology. He has done considerable work to document the "Mangrove Biodiversity of Andaman and Nicobar Islands". He has also brought out a compendium on "Mangrove biodiversity of Bay Islands" as well as a book on "Mangrove of Andaman". He has published a seminal paper on "Impact of tsunami on Mangroves of Andaman and Nicobar Islands". In addition to this, he has published a good number of research papers on Fisheries in International as well as National Journals. He has worked as the Director of Fisheries, Andaman and Nicobar Administration and has brought out policy documents on various issues related to Fisheries. As an Executive Director, Andaman Fisheries Limited, he was dealing with seafood report from Andaman and Quality control issues with respect to seafood. For past few years he has contributed substantially on documentation of the agro biodiversity of the islands in the form of books, Research article, Seminar paper and digital forms. He has numerous national and international research papers to his credit. His research contributions are fittingly recognized by ICAR at National level and four coveted awards viz., Fakhruddin Ali Ahmed Award, Hooker's Award and ICAR Team Research Award, Rajendra Prasad Puraskar, have been bestowed upon him. In addition to this he has been felicitated by the CP Ramaswamy Foundation for the excellent contribution for the documentation of bio diversity of the Islands. The Andaman administration also recognized his contribution for the development of island fisheries and has awarded the Lieutenant Governor's Commendation Certificate in 2008.

sibnarayan@gmail.com, directorcaripb@gmail.com, cari.and@nic.in