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Rapporteur's Report on Agriculture and Farm Livelihood in Disadvantaged Areas: Introspection of Socio-Economic Issues

Rapporteur: S.M. Feroze*

The underdeveloped agricultural production systems in disadvantaged areas, *viz.*, the hills, coastal, dry and arid regions are characterised by low or zero level of input uses which in turn inhibits the agricultural productivity and generates very low level of marketable surplus. Moreover, poor infrastructure, history of lower level of policy support, higher frequencies of natural calamities like drought, flood or cyclone, add to the misery of agriculture and people dependent on it. Policy initiatives and extension strategies play a very important role in developing the disadvantaged agriculture but the success of these strategies depend upon their suitability to the behaviour of the target audiences and characteristics of the geographical terrains. Location-specific and gender friendly technologies need to be developed and diffused among the farmers for the growth of agriculture. We have received total 17 papers under this Theme IV. The papers are categorised sector wise and issue wise *viz.*, (i) Agriculture and allied sectors, *viz.*, horticulture, forestry, fishery, livestock etc. (ii) Climate change, risk planning and sustainability and (iii) Extension and policy issues.

Agriculture and Allied Sectors

In this section the researchers estimated the costs of cultivation, studied the rural livelihood at local level, role of floriculture, fishery and importance of natural rubber in income improvement in the agriculturally disadvantaged areas of India and especially in Northeastern region of India. Some of the papers also identified the constraints hindering the progress of agriculture in these areas. Sunil Kumar Singh has estimated the economics of hybrid rice cultivation in Northern Hill zone of Chhattisgarh. The cost of cultivation was estimated to be about Rs.40062/ha, out of which 35 per cent was labour component. The cost of cultivation was highest for large farmers and lowest for small farmers. The net return was highest for marginal farmers and lowest for small farmers. The input output ratio was highest for medium sized farmers. The study of disposal pattern revealed that the farmers primarily sold to government agencies, followed by directly to consumer and private agencies. Cropping intensity has direct relationship with farm income. Jayanta Saud took account of crop diversification while investigating the impact of cropping intensity on

*Assistant Professor (Economics), School of Social Sciences, College of Post Graduate Studies, Central Agricultural University, Umiam-793 103 (Meghalaya).

farm income in Brahmaputra valley of Assam and reported that it directly as well as indirectly influenced the gross value addition in the study area.

Understanding of the local economy is crucial for proper policy initiatives in any disadvantaged area. F.A. Shaheen *et al.* comprehensively studied the rural economy of Gurez valley in Kashmir which is vulnerable to geopolitical affairs. At present the income through small ruminant production system is affected. Inaccessibility, marginality of resources, fragility, and replacement of less productive system are some of the major constraints in economic development of the valley. They suggested fodder improvement through introduction of Sabzar and Shalimar fodder oat-1. Mushroom also has the potential to improve the livelihood of the people in the valley; hence, supply of quality planting material is important. They stressed on cold water fishery which has a niche market. Babu Singh *et al.* studied the diversification effect of livelihood in Bundelkhand region of Uttar Pradesh. They observed that the development of water shed has not only improved the vegetation but also led to area expansion and increased crop productivity and increase in livestock population in the watershed area. These in turn has enhanced the employment opportunities in the region.

Three papers dealt with the fishery sector which is considered to have huge potential to improve the rural economy in the disadvantaged areas. A. Ronel *et al.* reported that the total cost of fish production was Rs.105261/ha and the net farm income was Rs.32184/ha in Bishnupur district of Manipur. The net farm income from fishery was significantly higher for category II (<1 ha) than category I (≥ 1 ha) farms. The B-C ratio was about 1.56 reflecting high profit in this enterprise. Lack of training, non-availability of credit facilities and inferior quality of fingerlings were the major constraints faced by the fishermen or women in fish cultivation. Banti Debnath *et al.* reported that income generated from fishery was more than 64 per cent of the total family income in Tripura. Availability of modern technology determined the income. Both, male and female were equally benefitted from fish cultivation. Especially the fisher women participated in different social events and they concluded that women's social participation can lead to economic improvement too. In another paper, Namrata Gohain and Premadhar Deka enlisted the fishery resources available and the infrastructural growth related to fishery in Assam and concluded that the opportunity in fishery is unlimited in the state. One paper by Binodini Sethi also discussed the role of livestock sector in Northeastern region of India.

Gaurav Sharma reported that the bamboo plantation was undertaken in barren and forested land in Tripura. This is a transformation from labour based subsistence livelihood of humans as to improved livelihood based upon natural rubber. They explained beautifully the transition of agriculture from when it was source of wages to the rural mass to the modern commercial agriculture with profit as primary motive. Dipali Baishya and Gayatri Goswami studied the constraints in floriculture in Assam. They reported that land area, labour, fertiliser and irrigation had significantly influenced the marigold production. They stated that non-availability of planting

material and lack of market information were the two major constraints faced by the marigold growers in Hajo.

Climate Change, Risk Assessment and Sustainability

One paper by Asfika Begum and Ratul Mahanta focused on adaptation measures to cope up the challenge of climate change in three agro-climatic zones of Assam. They found that more usage of fertilizer, varietal adjustments, introduction of new crop and adjustment of planting dates were the different adoption strategies practiced by the farmers to cope up with the changing climate in the state. Income, extension and credit availability were the important factors which determined the choice of adaption strategies.

Two papers are concentrated on sustainability of agriculture, one focusing on macro and another on micro level. Elumalai Kannan found that the overall crop output growth was driven by Total Factor Productivity (TFP) and area growth in Madhya Pradesh. Area growth was augmented by irrigation expansion, but the area where tribal population was high, irrigation percentage was also very low and leading to lowering of crop productivity in Jhabua and Northern Hills of Chattisgarh. He concluded that regional inequity exists in agricultural development and it is starker in tribal dominated districts. Leishangthem Geetarani Devi studied the sustainability of rice farms in Thoubal district of Manipur and reported that the majority of the rice farms were moderately sustainable. Though these farms were socially and economically sustainable the status of ecological sustainability was a matter of concern in the study area.

Extension and Policy Issues

Proper targeting of beneficiaries is of paramount importance for implementation of any project and delivery of output. Sheela Kharkwal and Hamid Nazir wrote an interesting paper where they have grouped the farmers of Kumaon division of Uttarakhand in four clusters of milk producing households based upon socio-economic and farm characteristics using Principal Component Analysis (PCA) and cluster analysis. They felt it is important to target extension intervention. Priscilla et al. studied the participation behaviour of dairy farmers of Manipur in dairy co-operatives using double hurdle approach. They found that age, landholding, distance to market and herd size negatively affected the probability of participation while, proportion of crossbred to total milch animals and household milk production had a positive influence. The age of the dairy farmers and technical efficiency coefficients were positively related to the proportion of milk sold by the member farmers to the cooperatives. They suggested that young and enterprising individuals should be motivated to take up dairying and join the cooperatives. They recommended

popularisation of locally suitable exotic breeds, training on milk processing activities to counter the risk arising due to unstable socio-political condition of the state.

Deepak Shah felt that a future vision is a must to boost the contribution of allied sectors in Maharashtra. He suggested to increase the number of Artificial Inseminations (AI) through doorstep AI Pashu Sewaks, timely scientific interventions, and training of livestock rearers for developing the livestock sector in Jalna district. Similarly in case of poultry supply of hatching eggs, exposure units are crucial. He emphasised on supply of quality and healthy seed, protection from disease contamination for agricultural development in the state.

The entire theme is not properly covered as we have not received papers on agri-tourism, role of government schemes, studies on tradition farming systems and marketing. The papers covered primarily the Northeastern and Western Himalaya, Central and Western disadvantaged areas but did not cover the southern part of India as well as the coastal ecosystem. The papers also have not dealt with new methodological approaches to assess the disadvantages agricultural systems. Nevertheless the papers received primarily provided an overview of the status of different agricultural enterprises in disadvantaged areas of India, analysed the constraints and suggested the policy measures.