Preface

Agricultural scientists play a very important role in determining agricultural development and it is more so in the areas handicapped with natural calamities. By and large the development of agriculture is a constraint in terrain areas. Because all terrain areas are not suitable for cultivation.

Agricultural development means by and large an improvement of land productivity, with the application of higher degree of inputs. The main aim of agricultural development is to achieve increase amount of agricultural production and high rate of economic growth in order to bring about an improvement in the standard of living of the people. The development of this sector of economy, therefore, is a prime concern of planners, economists and geographers offers a challenge to them to find ways and means to achieve the goal.

More than 150 years ago Von Thunen's famous theory of location was concerned with agriculture. The era of agricultural geography as a new concept started only with the works of Jonasson (1925), Hartshorne Dicken (1935), Weaver (1944), Slam (1962) and Kostrowick (1957) opened new vistas of agricultural, geography. A review of geographical literature covering agricultural development in India reveal that rarely a distinction is made between the elements of agricultural development and the factors in agricultural development. Schwartzber (1962) concluded in his mapping of the levels of economic development in India, agricultural indicators of crop productivity, agrarian relations and institutional factor of members of agricultural credit societies per million of agricultural families. Ashok Mitra (1967) in his study included percentage of double-cropped area as an expression of intensity of cultivation. Nath (1969) maintained that agricultural development in India depends upon three factors – the growth rate of agricultural output, the use of modern inputs in agriculture and productivity per hectare. Sharma (1971) was of the opinion that

agricultural development should be assessed not only by agricultural production but also with reference to various physical inputs like fertilizer and extent of cultivated area.

Alma (1974) suggested six indicators such as percentage of gross irrigated area, gross cropped area and agricultural output per agricultural worker and per acre, canal irrigated and double cropped area. Moonis Raja (1978) in his study suggested as many as forty-one indicators of agriculture development grouped into four subsets of production conditions, productivity, agrarian relations and change in agriculture. Husain (1979) maintained that agricultural production of a region is determined by the combined influence of physiological, historical socio-economic, cultural and technological' forces. Husain also describes, "soil and their properties are also influenced directly and closely by topography relief and altitudes. Soils are also influenced by altitudes. The soils of mountains and valley very greatly over short distances." Das (1979) in his study of population pressure and intensity of cropping pattern pointed out that, the traditional mode of agricultural production with low out put from cultivated land has failed to support the overwhelming majority of rural population. Such population pressure on agricultural land has a tendency to intensify the cultivation of limited land with two or more crop sown during agricultural year in order to compensate the decrease in land man ratio" Chakraborty (1981) explained that the choices of crops to be cultivated by the farmers are governed by the compulsion posed by environmental endowments, satisfaction of hunger of the farmers and the demands of the metropolitan economy. Mukhopadhyay (1982) describes, "the improvement in irrigation and water supply have helped in reducing the degree of dependency on natural phenomena like hydro-meteorological conditions of the district. According to Safi (1984) "productivity is not fertility. It is generally used to express the power of agriculture in a particular region to produce crops without regard to whether that power is due to boundary of nature or to the effort of

man". Jana (1987) studied the cropped area of Darjeeling district and concentration of crops in different areas have been analysed. Bhattacharjee (1987) focused his study in net sown area and the area cropped more than once. The spatial analysis reveals that a core of high concentration of netsown area is surrounded by gradually declining net sown area. Das and Chakraborty (1988) have analysed the various ecological problems arising out of loss of vegetal cover in high fragile slopes of Darjeeling. Roy Choudhury and Mandal (1989) identified the zonal variations in soil, climatic parameters for a soil based agro-technological study. Mughal (2000) defined agro-forestry as multiple land use of an area simultaneously to meet diverse needs of the farmer. Sharma (2000) recognized agro forestry as a distinct discipline, which plays an important role in socio-economic transformation of marginal lands into more productive agrarian economy.

Singh (1994) in his study analysed the distance cost to explain spatial organization of agriculture at tube well service area. Malakar and Bews (1996) observed the steady improvement in agriculture during the last two decades, despite decline in net cropped area. In the same year Husain (1996) in his book describes "agricultural patterns are strictly dependent on the conditions of terrain, topography and altitude – while the paddy cultivators require leveled field, the tea planters perform well in undulating topography in which water does not remains standing". Vaid (1997) studied the temporal variations in landuse pattern and possible causes of changing land use are interpreted. Kothari, Kohli and Jain (1999) mentioned that regional disparities are not removed or controlled. These disparities exist mainly due to distinct geographical and topographical features, which ultimately lead to variations in demographic, social cultural and economic characteristics. Sahi (2001) suggested that heavy dependence on rice and wheat as is not appropriate and cultivation of coarse grains should be part of landuse. In the opinion of Verma and Singh (2001) agricultural development of landscape and improvement of productivity by ameliorating adverse conditions

through modern farm technology. Mifzur (2003) studied to determine the agricultural efficiency of Bihar by Kindall's method of ranking co-efficient. The study reveals that the district of North Bihar plain area attached to the Koshi river are not agriculturally efficient because of devastating floods and inadequate irrigational facilities. Prasad (2004) defined that changing landuse pattern of agricultural landscape and environmental development planning under spatio temporal framework. Taufique (2004) in his study assessed the spatial variation in the levels of agricultural productivity through out his study period. Walford in (2005) highlighted the size of individual holding of a farmer fluctuates with gains and losses even if the overall trend is for enlargement.