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Population and agro climatic zones in India: An analytical analysis

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Abstract

India is considered as developing country where agriculture is prime occupation of the masses in rural areas. Near about 70 per cent of the population is dependent on agriculture for their livelihood and more than 60 per cent of the population lives in rural areas. Indian agriculture is also based on the monsoon. There is a positive relationship between agriculture and climatic change. Production and productivity of agriculture depends upon various aspects like size of landholding, soil quality degradation deforestation, pollution and lowering of underground water level. Due to modernization and mechanization in agriculture, there has been a lot of transformation in agriculture in terms of its varieties of crops, nature of production, marketing, etc. Unfortunately, population pressure and climatic change has been responsible to decrease the production and productivity of agriculture resulting poverty and inequality in India.

In this paper, an attempt has been made to study various issues and dimensions and challenges related to land use planning, population and agro climatic zones with special reference to Uttar Pradesh state in India. It will also be examined the governmental role to formulate perspective land use planning taken into account the population pressure and changes in agro climatic zones.

The study concluded that the per capita net sown area has been decreasing due to population growth and the basic needs and population growth has also adverse effects on climatic conditions. It was suggested that there is a need to control rapid changes in climatic conditions in order to promote plantation and stop deforestation.

Keywords: Agriculture; Agro Climatic Zones; Population; Transformation; Planning

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1. Introduction

Land is one of the prime natural resources of a country. Any city grows not only by population but also by changes in spatial dimensions. Land use change, including land conversion from one type to another and land cover modification through land use management, has greatly altered a large proportion of the earth's land surface to satisfy mankind's immediate demands for natural resources (Meyer and Turner, 1992; Vitousek et al., 1997; Foley et al., 2005). Land and people are the most important natural resources that are mutually interrelated and inter-dependent for their sustainable development. Land is an important resource of any country for the sustenance of the people. Though it is a fixed, scarce, tangible and immovable resource, it is a degradable and transferable entity that could be sustainable only if properly used by the human population. The use of land is very wide and intense and the demand for land has been increasing for its various uses over time. In fact, there are competing uses such as forests, agriculture, industry, housing, infrastructure, services and recreation. As such, the land use pattern is highly influenced by the various deliberate interventions by the people and has been undergoing changes significantly (Lee et al., 1988; World Bank, 1984).

The issue of land use changes is very important in the context of increasing population pressure. When the pressure on land by man increases, it would lead to both extensive and intensive use of land. Such a change in the use pattern is not just easy and simple, but is highly complex. It is highly shaped by agro-climatic, demographic, socio economic, political and institutional factors either independently or jointly. In this regard, the questions are: What are the changes in land use pattern? To what extent, the changes in land use pattern differ across regions or countries? To what extent, the population pressure influences the land use pattern? (R. Albert Christopher Dhas 2002). Human population growth represents the primary driving force in land use change (Vitousek et al., 1997). Asia is the home to nearly 3.5 billion people among a worldwide population of more than 6 billion, and the world's two most populous countries (China and India), each with more than 1 billion people (Hillstrom and Hillstrom, 2003), so with this huge population the changes in the earth surface features and its ecological consequences have been becoming a critical issue and of great interest in Asian countries.

Land use/Land cover change information has an important role to play at local and regional as well as at macro level planning. The planning and management task is hampered due to insufficient information on rates of land-cover/land-use change. The land-cover changes occur naturally in a progressive and gradual way, however, sometimes it may be rapid and abrupt due to anthropogenic activities. The growing population and human activities are increasing the pressure on the limited land and soil resources for food, energy and several other needs. As the population increases particularly in the urban areas by attracting job opportunities and city spreads outward from its limit, encroachment on the surrounding available land starts. Due to increasing number of population, agricultural land starts converting into built up area and forest areas starts converting into agricultural land, built up etc. Thus, spatial and temporal analysis technologies are very useful in generating scientifically based statistical spatial data for understanding the land ecosystem dynamics (Ashutosh Singh et al., 2013).

Sustainable land and natural resource management is fundamental in ensuring adequate food and fibre production. The land use intensification and the expansion of agricultural land at the expense of natural or semi natural vegetation constitute key variables in the cycle of un-sustainability linking degradation of natural resources to demographic pressure. Despite the impressive gains in agricultural production and productivity via crop intensification, the most of the regions are facing problems related to the land degradation due to intensively cropped lands, the overuse of ground water, excessive nutrient loads in surface and ground water, and increased pesticide use. Low levels of land productivity and subsequent land and resource degradation can often be traced to inadequate access to the best or most appropriate knowledge required to overcome local constraints. Providing better information to both technology developers and farmers can stimulate the adoption of both soil conservation technologies and improved land management practices. A sustainable and increasingly productive agricultural base is essential for food security.

In developing countries, the increasing pressure of population and consequent rising demand for food and shelter are putting great strain on land as well as on traditional ways of life. They have been exerting a great pressure over forested areas, fallows and other vacant lands towards a change in land use. The influx of population in areas hitherto sparsely populated further aggravates the position and increases pressure on land (V.R. Singh, 1987). India is considered as developing country where agriculture is prime occupation of the masses in rural areas. Near about