

## CHANGES IN LAND USE PATTERN AND ITS IMPACT ON ENVIRONMENT AND RURAL LIVELIHOODS

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### ABSTRACT

*This paper tries to examine the changes in land use, its causes and the impact of changes in land use pattern on environment and livelihoods of the rural poor in Karnataka. It is found that there have been significant changes in the land use pattern over the period of 1960-61 to 2010-11 in Karnataka. The results show that area under forest has been increasingly but area under pastures and grazing land, cultivable waste and barren & uncultivable, which are used by the communities commonly, have been declining very rapidly. Apart from decline in area they have also been declining in quality as most of these areas are waste land. Many efforts have been made to optimum utilization of agricultural land and the forest. But the other categories land, (significant proportion of them has been used in common) especially grazing land which is very useful for the rural households, has been neglected by the policy makers and the implementing agencies. Significant proportions of these lands have been used in common since long for livelihoods activities by the rural households. Depletion of these resources has adversely impacted the life of these people. Therefore, policy makers and implementing agencies should take necessary action to protect and develop these common resources for the benefit of common man in rural areas.*

*Key Words: Land use, Common Property Resources, Livelihoods, Rural Households*

### INTRODUCTION

Natural resources comprising land (include forest) and water constitutes the basic support system of life on earth (United Nations, 1996). The economic, social, infrastructure and other human activities are undertaken on land (KLUB 2001). The sustenance activities of man, such as food production, shelter, infrastructure development and extraction of natural resources, depend on land. The growing pressure of population coupled with an increasing variety of demand on land resources has brought extra pressure on available land resources. In developing countries like India, land is the most important factor that influences the livelihood of rural communities and it is the main asset for income earning. In rural areas the households have small amounts of physical assets to get employment. Landlessness and the limited access to land is the main feature of rural poverty (Swanson, 1996). In India the incidence of poverty is the highest among the agricultural labour households who have little access to land (Swanson, 1996; United Nations, 1996). Poor people also have their own labor as a resource but employment possibilities are usually limited. The

concept of land use is related to the use of land which is used for certain activity for a given period of time. It has been found that land use pattern has been changing over the period of time. Since the land is the important factor that influences the livelihood of rural communities, the changes in the condition and composition of land use cover affects the livelihood of rural communities directly or indirectly. But land resources, as a result of continued exploitation and mismanagement are becoming increasingly scarce.

Most of the rural households, especially vulnerable sections, usually depend on forest, grazing land, and other resources. These are the resources used in common by people in the form of Common Property Resources (CPRs). In India, CPRs comprise substantial proportion of natural resource endowment and rural communities, particularly the most vulnerable sections of rural poor, usually are dependent on common property resources (CPRs) for their survival. The depletion and degradation of CPRs have threatened the long-term sustainability of the natural resource endowment of the country. They have also increased the difficulty of the poor people whose basic survival invariably depends on these resources (Arnold and Stewart 1991: in Kumar 2000). In order to deal with all these problems and to plan for optimum utilization of land, it is necessary to have accurate and up to date information in all possible details on land use. Thus, land has several uses and several stakeholders and to meet all the needs proper land use planning is necessary. In this paper, an effort has been made to analyze the changes in land use changes in Karnata using the secondary data obtained from directorate of economics and statistics, government of Karnataka for the year 1960-61, 1970-71, 1980-81, 1990-91, 2000-01, and 2010-11. The existing literature has been used to understand the reasons for land use changes and its implications on rural households.

## **LAND USE CHANGES AND ITS IMPACT ON ENVIRONMENT AND RURAL LIVELIHOODS**

In this section, the changes in the land use pattern, its impact on environment and rural livelihoods has been analyzed. Ministry of Food and Agriculture, government of India (1948) recommended nine fold land use classification which has been used presently. The nine-fold land use classification is as follows: 1) Area under forests 2) Barren and uncultivable lands 3) Land put to non-agricultural uses 4) Permanent pastures and other grazing lands 5) Cultivable wastes 6) Miscellaneous tree crops and groves not included in the net area sown 7) Current fallows 8) Fallows other than current fallow and 9) Net area sown. This pattern of classification is considered as static harmony and adjustment with the other main characteristics of the economy of the region. Based on nine-fold land use classification, the land use changes in Karnataka have been presented in table 1.

**Table 1: Land Use Changes in Karnataka (Area in Lakh Hectares)**

Sl. No	Classification	Year					
		1960-61	1970-71	1980-81	1990-91	2000-01	2010-11
1	Total Geographical Area	187.8	189.43	190.5	190.5	190.5	190.5
2	Forest	27.09	28.9	30.33	30.74	30.68	30.72
3	Land put to non-agri.uses	8.12	9.37	10.66	11.89	13.12	14.3
4	Barren & uncultivable land	9.22	8.39	8.44	7.99	7.94	7.87
5	Cultivable waste	6.56	6.15	5.02	4.46	4.27	4.14
6	Permanent pastures & other grazing land	17.39	16.19	13.46	10.98	9.59	9.12
7	Misc. Tree crops, Groves	3.66	3.11	3.42	3.16	3.03	2.86
8	Current fallow	8.35	8.11	14.59	12.9	13.67	11.99
9	Other fallow land	5.13	6.72	5.58	4.57	4.08	4.26
10	Net Area Sown	102.28	102.48	98.99	103.81	104.1	105.23

Source: <http://raitamitra.kar.nic.in/KAN/Document/agriprop.pdf>

Table 1 shows that the reported geographical area was 187.8 lakh hectares in 1960-61 and 1970-71. Due to improvements in recording and reporting of data, the geographical area registered 190.5 lakh hectares in 1980-81 onwards. In 2010-11, net area sown, forest, land put to non-agriculture use and current fallow constitute significant proportion of total geographical area.

The forest area includes all lands classed as forests under any legal enactment dealing with forests or administered as forests. There has been increasing pressure on forests for extracting its resources like timber and NTFPs. The forest areas have been diverted to many development activities like irrigation projects, hydel projects, mining/quarrying, roads, laying of transmission lines and other purposes (Table 2).

**Table 2: Forest Areas Diverted for Various Developmental Activities**

Purpose	Extent of Area diverted from 1956 to 1980 (sq.km)	Extent of Area diverted from 1981 to 2002 (sq.km)
Irrigation Projects	350.27	9.19
Hydel Projects	160.92	51.75
Mining/Quarrying	426.72	43.39
Construction of roads	3.16	0.17
Laying of transmission lines	12.05	8.81
Other Purposes (including diversion for agriculture, regulation of encroachments, etc)	962.51	228.23
Total	1915.64*	345.2*

*State of Forest Report 2003, Karnataka*

In spite of diversion of area, the area under forest has been increasing steadily over the period from 27.09 lakh hectare to 30.73 lakh hectares in Karnataka. According to the recent press releases by Forest Survey of India (FSI), the forest area has been increased in Uttara Kannada and Chikmagalur districts. This is mainly because of plantation and conservation activities under social forestry and Joint forest Management (JFM), both within and outside the recorded forest areas. But, it is distressing to note that the area under forest cover has been declining in many parts of the State. Therefore, efforts should be made to maintain the forests in the state. Forests provide a wide range of ecological, economic and socio-cultural benefits and enhance the quality of life of people (Shiva 1986). Before independence, the forest policies were aimed at only generating the income, neglecting the rights of people. But after the independence, number of forest policies have been implemented to protect the forest and to provide access to forest resource to rural people. In the year 1988, National Forest Policy has been enacted to involve the rural communities in protection and management of forest resources. Village forest committees (VFCs) have been formed and they are protecting large area of forest land in Karnataka. Thus, systematic efforts have been made to protect environment and to benefit the rural communities by forest department by implementing various policies and programmes.

The next category of land which has been increasing is non-agricultural land. The areas under non-agricultural uses include lands occupied by buildings, roads and railways or under water, e.g. river, and canals and other lands used for non-agriculture purpose (like cities, townships, mining, industries, etc. Area under this, increased from 8.12 lakh hectares in 1960-61 to 14. lakh hectares in 2010-11. In view of

increasing population (Like housing) and economic activities (industrial areas, etc), this type of land use is expected to increase very fast. The land for non-agricultural purposes has mainly taken from pasture and grazing land, cultivable waste and barren & uncultivable land. This type of land use change has been observed in and around the urban areas and result in decline of common property resources (CPRS) for the sub-urban/rural people. Decline of CPRs adversely affect the livelihoods of these people. Therefore, efforts should be made to protect the livelihoods of people while converting the land for non-agricultural purposes.

Barren and un-culturable land includes all land covered by mountains, deserts, etc. Land which cannot be brought under cultivation except at an exorbitant cost is classified as unculturable. Such land may be in isolated blocks or within cultivated holdings. This area declined from 9.22 lakh hectare to 7.87 lakh hectare from 1960-61 to 2010-11. It seems that utilization of this type of land has no significant impact on the environment and livelihoods of people as it doesn't have any plants and greenery. However, efforts should be made to develop these lands by planting appropriate type of trees suitable to climate to ensure optimum utilization of resource. This is expected to reduce soil erosion and extension of waste land. The local communities, Gram Panchayats and NGOs can play important role in this regard.

Permanent pastures and other grazing lands include all grazing lands. They may be permanent pastures and meadows (KLUB 2001). Village common grazing land is included under this head. The area under this category of land has declined significantly from 17.39 lakh hectares to 9.12 lakh hectares from 1960-61 to 2010-11. The area under pastures and grazing lands has been mainly allotted or encroached to non-agricultural purposes, namely housing and agriculture. Significant proportion of this land has been encroached or used for other purposes. Traditionally, this type of land has been used by the village communities as a source of fodder. Though, they are generally reserved for grazing the livestock, provide many useful resources such as fuel, medicinal herbs, etc along with providing environmental services, such as protecting soil erosion. Thus, grazing lands play very important role in providing various services to the mankind like forests. Therefore, these lands should be made available for the purpose they were originally provided. Grasses and fodder crops including fodder yielding trees should be planted with the required soil and moisture conservation practices. In this regard, local community, Gram Panchayats and NGOs can play important role by adopting participatory approach in managing these resources. Understanding the linkages between environment and poverty in determining development outcomes, and recognizing the significant dependence of rural people on natural resources, the 73<sup>rd</sup> Constitutional Amendment created enough space for decentralized natural resource management by PRIs. The responsibility of preparing plans for the management and development of natural resources has been given to Gram Panchayats. This is a crucial step in protecting the CPRs and ensuring sustainable livelihoods of rural communalities. Strengthening of Gram Panchayats at the community level enables them to function as local self-governing bodies. This has given impetus to participatory democracy in general and to decentralized governance of natural resources in particular. The recent studies indicate that neither the Gram Panchayat President nor the Panchayat

Development Officer (PDO) has knowledge about development of grazing lands and hence these resources have been neglected.

Cultivable Wasteland includes lands available for cultivation. Such lands may be either fallow or covered with shrubs or jungles, which are not put to any use. Land once cultivated but not cultivated for five years in succession are included in this category at the end of the five years (KLUB 2001).. The area under this category of land has declined significantly from 6.56 lakh hectares to 4.14 lakh hectares from 1960-61 to 2010-11. The “wasteland survey and reclamation committee” defines “culturable waste” as the land available for cultivation but not used for cultivation for one reason or the other. This land was used in the past but has been abandoned due to such constraints as lack of water, salinity or alkalinity of soil, soil erosion, water-logging, an unfavourable physiographic position, or human neglect. National Remote Sensing Agency (NRSA), Hyderabad is making valuable contribution in mapping the wastelands in India through satellite imageries. The decline in the wasteland may be due to some land reclamation schemes introduced by the government (KSLUB 2001). These efforts should continue on the large scale for optimum utilization of land.

Land under miscellaneous tree crops includes all cultivable land, which is not included in ‘Net Area Sown’ but is put to some agricultural uses. Lands under Casuarina trees, thatching grasses, bamboo bushes, and other groves for fuel, etc which are not included under ‘Orchards’ are classed under this category. The area under this category of land (1% of geographical area) has declined from 3.66 lakh hectares to 2.86 lakh hectares from 1960-61 to 2010-11. This may be due to conversion of land under trees to seasonal crops.

Current Fallows represents cropped area, which are kept fallow during the current year. For example, if any seeding area is not cropped against the same year it may be treated as current fallows. The area under current fallows declined from 8.35 lakh hectares to 11.99 lakh hectares from 1960-61 to 2010-11. There is considerable variation from year to year which appears to be mainly due to aberrations in rainfall.

Fallow lands other than current fallows include all lands, which were taken up for cultivation but are temporarily out of cultivation for a period of not less than one year and not more than five years. The area under fallow lands other than current has decreased from 5.13 lakh hectares to 4.26 lakh hectares from 1960-61 to 2010-11.

Net Area Sown represents the total area sown with crops and orchards. Area sown more than once in the same year is counted only once. The net sown area depends mainly on rainfall and hence there have been fluctuations in the new sown area over the period of time. Cropped area in the year under consideration is called net sown area. Agricultural production largely depends upon this type of land and hence this type of land has a special significance in an agricultural country like India. There has been heavy pressure on

this type of land due to increasing population. For producing more food and other crops efforts are being made to provide HYV seeds, fertilizers, irrigation, extension facilities, etc. efforts are also being made to improve the quality of land. But due to fragmentation of land and decline of common lands, agriculture as a economic activity, has become unviable.

Thus, land under forest and non-agricultural use has been increasing. There are number of policies and programmes for forests but there are no specific policies and programmes to protect and develop land under pasture and grazing lands, cultivable waste and barren and uncultivable land. Decline of these resources have adversely affected the livelihoods (especially in dry regions) of rural households in Karnataka.

## **CONCLUDING OBSERVATIONS**

The paper reveals that there has been significant change in the land use pattern in Karnataka over the period of time. It finds that systematic efforts have been made to protect and develop forest land where as the other land, especially grazing land has been neglected by the policy makers and implementing agencies. This has led to decline of grazing and other type of land which are used commonly by the rural people. The decline of these lands adversely impacted the livelihoods of rural people. Therefore, efforts need to be made especially Gram Panchayats to protect and develop these lands.

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