

# Land Degradation In Kota District : Causes and Management



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## Abstract

Land degradation pertains to the decrease in the producing capacity of fertile land due to water erosion of soil and wind, evisceration of soil humus and nutrients. In other way depletion and reduction of vegetation cover, salinization as well as loss of diversity land degradation deeply debilitate the sustenance opportunities, thereby leads to poverty, migration and food insecurity. Air polluting units are principally situated at Kota and Ramganjmandi, industrial, potential mineral, solid/hazardous waste, vehicular pollution, domestic sewage are immediate or long term risks to humans, animals, plants or the environment. Manage land degradation by integrated land use policy and sustainable development.

**Keywords:** Land Degradation, Industrial Pollution, Food Insecurity, Population, Resources Conservation.

## Introduction

Land degradation pertains to the decrease in the producing capacity of fertile land due to water erosion of soil and wind, evisceration of soil humus and nutrients. In other way depletion and reduction of vegetation cover, salinization as well as loss of diversity land degradation deeply debilitate the sustenance opportunities, thereby leads to poverty, migration and food insecurity. Rajasthan is located north western part of India. This state is largest state in terms of area [India]. Rajasthan has geographical area of 34.22 million hectare [10.41% area of country]. Rajasthan is the seventh largest by population and the second largest by livestock population of the country. The consequent result of the combined pressure of population and livestock has declined. Similarly per capita net sown area has declined. No doubt the productivity of food grains and non-food grains has increased to meet the requirement of food for the increased population.

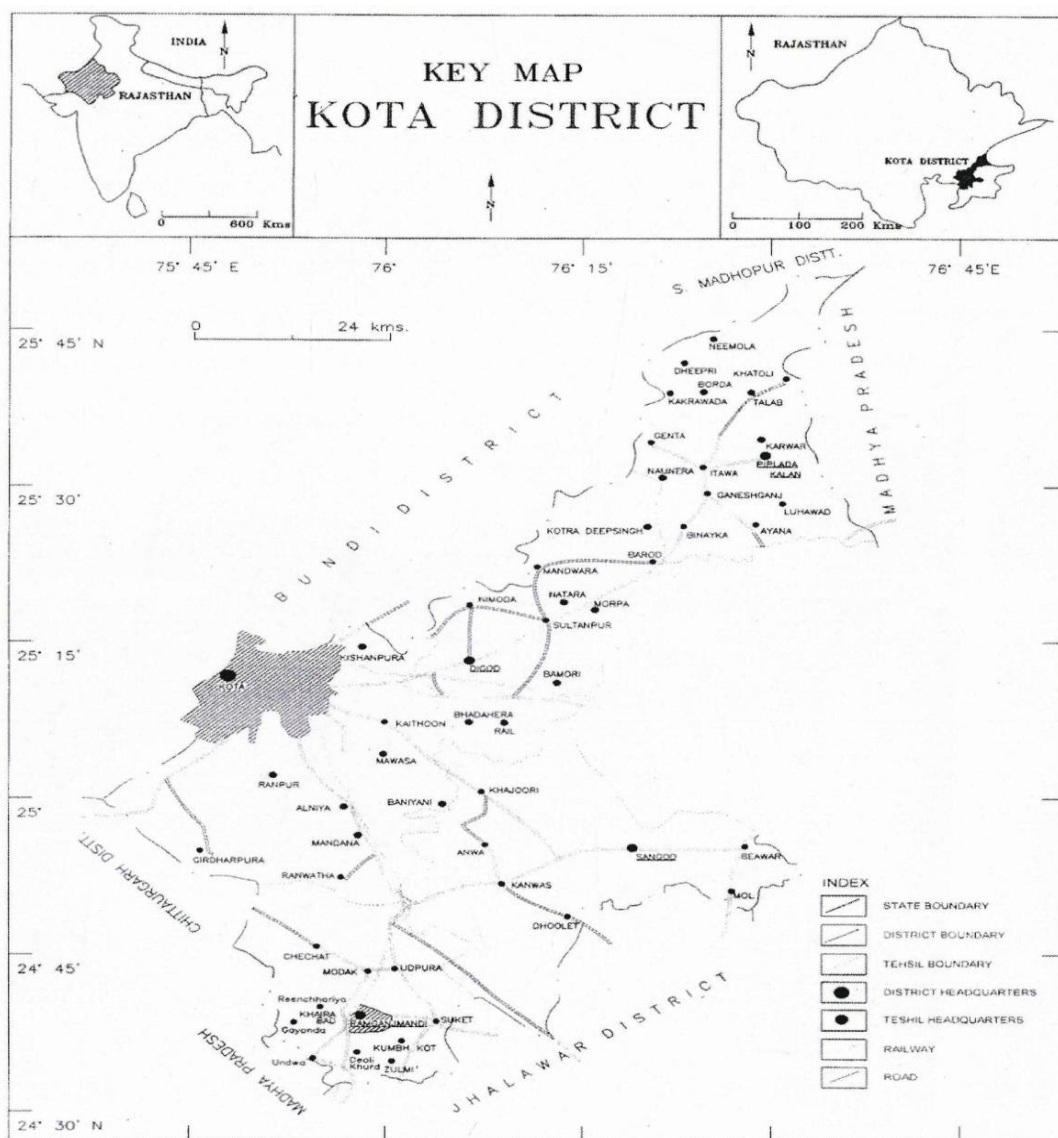
Kota city has been also tremendous pressure on land due to misuse of water, the increase of population and livestock land and water are the most prime natural resources and improper management of such resources leads to severe problems. In Kota city, total population has increased from 694316 in 2001 to 1950491 in 2011. However, the density of population has increased from 288. Persons per sqkm in 2011 to 374 persons per sqkm in 2011 n growth of population is directly or indirectly effective at per capita net sown area, productive or other things or all factors indirectly increased environmental degradation. Air polluting units are principally situated at Kota and Ramganjmandi, industrial, potential mineral, solid/hazardous waste, vehicular pollution, domestic sewage are immediate or long term risks to humans, animals, plants or the environment.

## Aim of the Study

Stop land degradation by sustainable development and integrated land use policy and safe the environment.

## Review of literature

Soil Degradation In India : Challenges And Potential Solutions (April 2015) , Cost Of Land Degradation In India (April 2017)



Published by Government of India

However, the underlying factors such as increasing population, poverty and land shortage are stronger reasons which act as a vicious circle for land degradation, limited land resources and increase in rural population are the two important forces which lead to soil degradation.

**Land Degradation Causes**

Land resources are linked with other resources such as forest and water. Poor management of any of these resources would affect the land quality. On the other hand, defective agricultural practices would lead to deterioration of land quality. Land degradation takes place largely in the form of soil erosion due to water. Land degradation is a human induced or natural process which negatively affects the land to function effectively within an ecosystem, by accepting, starting. Direct and Indirect causes are :

1. Floods and surface run off.
2. Excess or inappropriate use of water resulting in water logging and salinity.

3. Industrial effluents pollute surface/rivers tanks, as well as subsurface ground water bodies. The use of these polluted water sources has resulted in several damage to croplands with significant decline in yield rate.
4. However, the increase of input intensification such as chemical fertilizer and pesticides, groundwater and modern agro mechanisms has resulted both reversible and irreversible land damages to the areas under crop.
5. Mining industrial waste.
6. Unwise land use, improper cropping system with no conservation measures, excessive use of chemicals exploitation of ground water indiscriminate deforestation, shifting cultivation etc. water erosion is very prominent in Kota district.

Thus looking to population pressure of human beings and livestock and their activities in addition to climate wind and water effects, an attempt was made to measure the extent of land degradation and its effect on sustainable land in Kota.

**Table 1 : Degraded and Wastelands Statistics of Kota**  
(Area in '000 hectare)

District	Degraded and Wastelands Classes			Saline and Sodic Soils	Total of Classes	Other	Total
	Exclusively Water Erosion (>10 tonnes/ha/yr)	Water erosion under open forest	Exclusively wind erosion				
Kota	417	9	0	0	426	119	545

Published by NBSS &amp; LUP, Udaipur (Rajasthan).

**Research Methodology**

The research study will cover of Kota. The information obtained as a result of this study will reflect the real situation that "How to increasing population, deforestation poverty water logging, water erosion, etc. effect and adversely limited land resources."

Analytical research method will be used. The analytical scope covers the fulfillment of the objectives set out of appropriate suggestions how we can control environmental degradation in limited land resources.

**Land Utilization**

Kota city is located in very humid region in the Rajasthan. Kata has fertile land but urban

environmental issues like lack of air quality. Subsequent flooding increased local temperature and diminution of water quality are generated by human raised changes in land used patterned. Agriculture land is converting in growth of buildup areas. In Kota city Increasing of population and food demand is seeming in kata city.

In last decades there for formers are left only with intent agriculture in the decrement cultivate land. The tendency not only speed up the land degradation but also reduce the chances for increasing the food production. Human induced changes in land use and land cover

**Land Utilization in Kota****Table2 :Land use/land covers change statistics for Kota city**

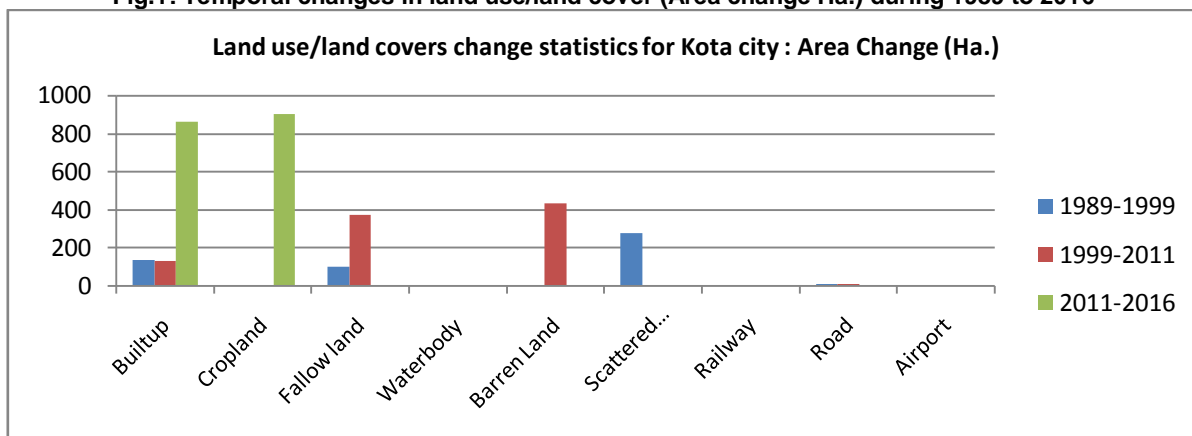
Land Use Class	Area Change (Ha.)		
	1989-1999	1999-2011	2011-2016
Built-up	1357.8	1595.5	4311.8
Cropland	-564.6	-5884.2	4520.8
Fallow land	1007.4	4498.8	-6215.0
Water body	-492.2	-71.3	-119.2
Barren Land	-4167.1	5200.1	-1614.1
Scattered Vegetation	2780.2	-5434.7	-896.5
Railway	0.1	0.7	0.5
Road	77.2	94.2	10.0
Airport	1.4	0.9	1.7

Land Use Class	Change (%)		
	1989-1999	1999-2011	2011-2016
Built-up	82.0	52.9	93.5
Cropland	-6.4	-71.6	193.9
Fallow land	56.1	160.5	-85.1
Water body	-24.9	-4.8	-8.4
Barren Land	-14.9	21.8	-5.6
Scattered Vegetation	44.9	-60.6	-25.3
Railway	0.1	0.4	0.2
Road	37.5	33.3	2.7
Airport	18.1	10.2	16.8

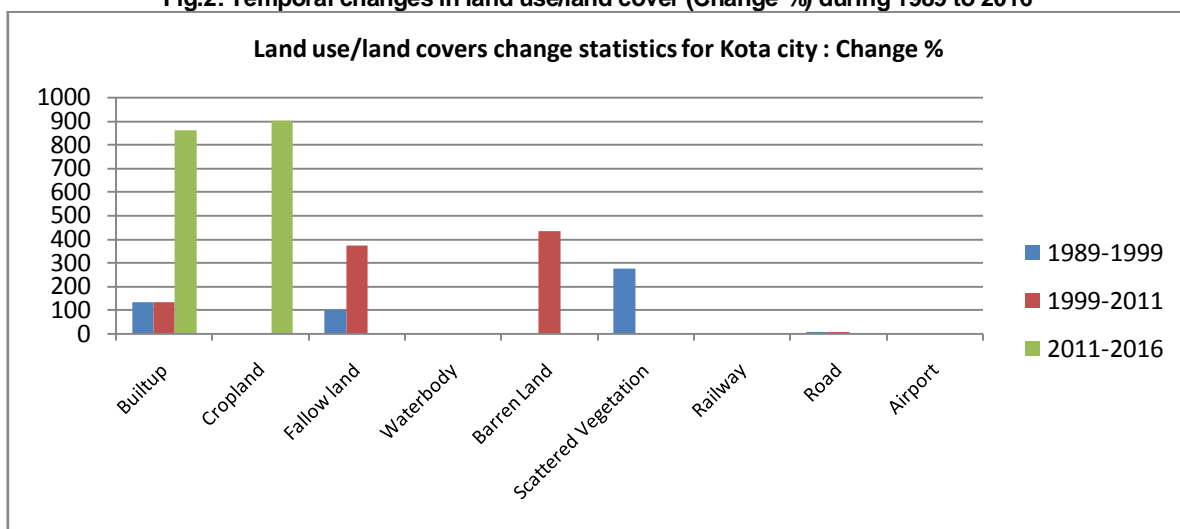
Land Use Class	Annual Change (Ha.)		
	1989-1999	1999-2011	2011-2016
Built-up	135.8	133.0	862.4
Cropland	-56.5	-490.4	904.2
Fallow land	100.7	374.9	-1243.0
Water body	-49.2	-5.9	-23.8
Barren Land	-416.7	433.3	-322.8
Scattered Vegetation	278.0	-452.9	-179.3
Railway	0.0	0.1	0.1
Road	7.7	7.8	2.0
Airport	0.1	0.1	0.3

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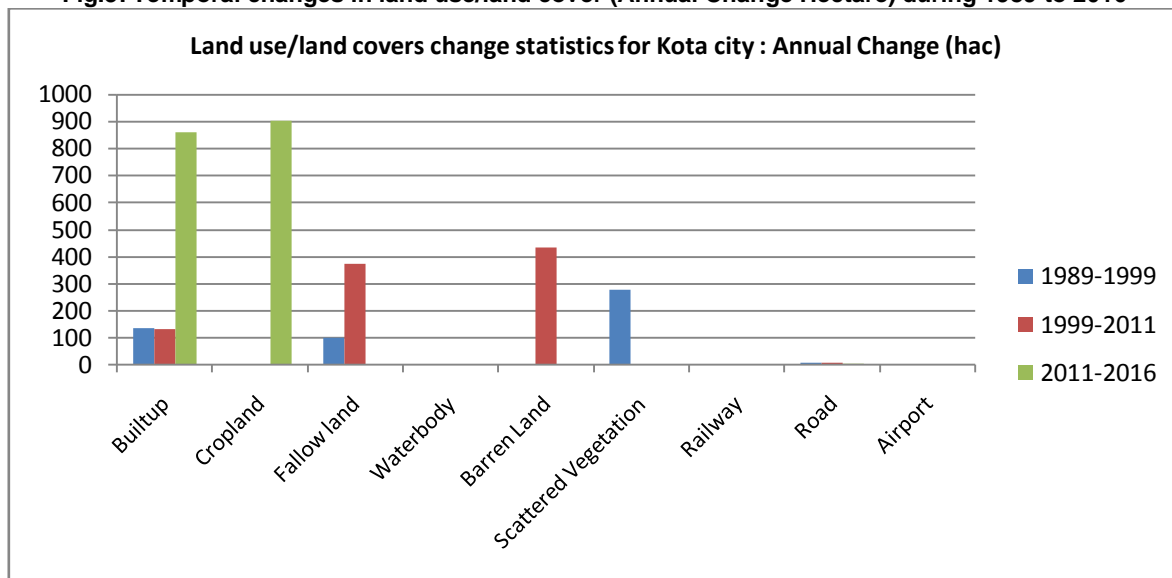
**Fig.1: Temporal changes in land use/land cover (Area change Ha.) during 1989 to 2016**



**Fig.2: Temporal changes in land use/land cover (Change %) during 1989 to 2016**



**Fig.3: Temporal changes in land use/land cover (Annual Change Hectare) during 1989 to 2016**



There is no doubt that human activities have profoundly changed land use/land cover in Kota city during the last 27 years (1989-2016). The table of four different year viz. 1989, 1999, 2011 and 2016 were used to calculate the area of different land use/land covers and observe the changes that are taking place

in the span of data. Over all classification accuracy of Kota city for the years 1989, 1999, 2011 and 2016 are 83.67%, 85%, 84.29% and 88.31% respectively.

The change detection analysis reveals that during 1989 to 1999, significant increase was observed in built-up area i.e. 1357.8 hectare (82%)

followed by fallow land (56.1%), scattered vegetation (44.9%) and road (37.5%). In 2011, classified output depicts that area under barren land was higher (59.5%) followed by fallow land (15%) and built-up area (9.4%) in comparison to 1989 and 1999. The land use/land cover statistics shows significant reduction in cropland (71.6%) and scattered vegetation (60.6%) during 1999 to 2011, however noticeable increase was observed in fallow land i.e. 4498.8 hectare (160.5%) where as built-up increased by 52.9%.

Results imply that built-up area increased by 18.3% followed by cropland (14%) in 2016. Excessive increase was observed in built-up (93.5%) and cropland (193.9%) during 2011 to 2016. By viewing Table it can be concluded that there is considerable increase in built-up area of Kota city i.e. the annual change during 1989-1999 was 135.8 hectare followed by 133 hectare (1999-2011) and 862.4 hectare (2011-2016). These results imply that maximum urban growth occurred in last 6 years. The continuous rise in built-up area is the impact of population pressure and economic development in the city. The analysis exhibits the huge growth in city periphery and most of the new built areas are developed near and along the major roads or highways (Dadhich et al. 2017). Results reveal that in last 27 years (1989-2016) the built up area increased by 438.7% followed by road network 88.2%, however there is decrease in cropland (22%), fallow land (39.5%), water body (34.6%), scattered vegetation (57.4%) and barren land (2.1%).

We see in Fig.1, Fig.2 and Fig.3 and Table 2 the results indicate that city have remarkable rapid changes in land use/land cover categories, particularly in built-up, catered vegetable, industrialization, solid waste material, fertilization, agriculture land, water body, road network etc. so that land has been degraded.

#### **Management for Land Degradation**

In Kota, so far land management has been largely unsystematic, arbitrary and by no means, sustainable. In order to reduce the degree of land degradation and for the country to move on the path of sustainable development the following strategies could be considered :

1. A well-defined, integrated land use policy should be developed and implemented at the earliest.
2. As the two resources, land and water are absolutely inter-dependent, therefore land management in conjunction with water management should be the care of any agenda for national development. The approach should be developed to manage the land on a natural watershed basis; as it presents an ideal unit for the most effective management, and the rational utilisation of land and water resources, for optimum production with minimum harvest to the resource.
3. IPNS (Integrated Plant Nutrient System) has to be adopted in Kota to improve fertilizer use efficiency and reduce the potential danger of pollution from higher nutrient use in agriculture and a systematic monitoring mechanism needs to

be developed, to assess the balance between input and withdrawal of nutrients, to guard against possible nutrient depletion.

4. Domestic and municipal waste, sledges, pesticides industrial wastes, etc. need to be used with utmost caution, to avoid the possibility of soil pollution by heavy metals and other toxic substance which are often present in them.
5. An increase in industrialization, urbanization, mining and infrastructure development is taking away considerable areas of land from agriculture, forestry, grassland pasture, etc. Resulting in environmental (land) disturbances. An area wide environment quality management approach needs to be adopted to harmonize such development activities and make them compatible with surrounding land use and guard against any farm of land degradation.

#### **Conclusion**

The problem of land degradation is therefore, posing and serious threat to be sustained agricultural production and jeopardizing, food security not only far in present generation but also far the future generations. Degradation of the ecosystem particularly the land component and the consequential loss of productivity of this scarce resource would severely affect the livelihood of majority of human and livestock population. The analysis in Kota to quantify the spatial and temporal changes in land use/land cover fo Kota city during the 1989-2016. The spatiotemporal changes assessment in land use/land cover could help in understanding management for sustainable development of the Kota city. Education, training, research, and technology development enable to analyzing and adopting conditions and principles for sustainable land use as well as resources conservation technologies and practices.

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## *Remarking An Analisation*

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