ORIGINAL RESEARCH PAPER

Geography

URBAN GROWTH AND ENVIRONMENTAL CHALLENGES: A CASE STUDY OF JAIPUR CITY

KEY WORDS: Urban growth, Environmental challenges, Urbanization

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ABSTRACT

Urban growth – the growth and decline of urban areas – as an economic phenomenon is inextricably linked with the process of urbanization. The rapid increase of urban population and the urbanization leads to an ever increasing demand on the urban environment. In 2001 the population of Jaipur city was more than 23.23 lakh and according to the census of 2011 it has increased to more than 30 lakh. Jaipur city has experienced its expansion at the cost of peripheral agricultural land and the extensive damage to the environment due to industrial waste, pollution, unplanned expansion and encroachment by people for various purposes. The present study is aimed to analyze the urban growth of the city and to bring out it's impact on ecology and environment by using secondary data from various sources. Another objective of the study is to map the changes brought out by human activities particularly in the field of encroachments, unscientific land use , haphazard growth of colonies and also to suggest alternative strategy or lanes plan which would be able to solve the present environmental problem.

INTRODUCTION

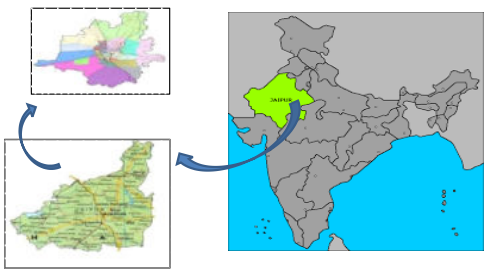
'Urban growth' refers to the process of growth and decline of economic agglomerations. Urban growth – the growth and decline of urban areas – as an economic phenomenon is inextricably linked with the process of urbanization. Urbanization is a world-wide phenomenon. Urbanization itself has punctuated economic development. It is a growth engine and a product of economic change. But the rapid increase of urban population and the urbanization leads to an ever increasing demand on the urban environment. The provision of infrastructural facilities required to support such large concentration of population is lagging far behind the pace of urbanization. It poses serious problems to the environment, the natural hydrological system and the people living in the area. As a consequence, the urban environment, particularly in large cities, is deteriorating very rapidly. All cities have severe shortage of water supply, sewerage, developed land, housing, transportation and other facilities.

Jaipur is a growing fast. It has become an education hub. In this city the no. of students is increasing fast. It has many coaching institutes and education centres.it is a place of employment for the places of nearby. Its own population is also expanding. Now according to census 2011, it has more than 30 lakh people. The increasing no. of population and vehicle has a negative impact on city's environment. This city's environment is degrading day by day. Some mishaps like oil depot also making the problem bigger.

STUDY AREA

Jaipur is the capital city of Rajasthan state of India. It is located on 26° 55' north latitude and 75° 49' east longitude. The city is surrounded by the Nahargarh hills in the north and Jhalana in the east, the south and the west of the city are also prevailing hillocks but they are isolated. Climate is Semi Arid, Rainfall is about 60 cm from south west monsoon.Temperature reaches highest in june(40 degree c) and lowest in january (8.3 degree c), Humidity stands between low to moderate.

Key map



OBJECTIVES

There are three objectives of this research paper

First objective is to analyze the urban growth of the city.

The second objective is to analyze the major changes in land-use of the city.

And the third objective is to study and measure the level of major four air pollutants.

HYPOTHESIS

The growth of cities affect the environment of cites negatively.

DATA BASE

Data is collected from various sources:

Departments:

1. Directorate of economics & Statistics.
2. Rajasthan State Pollution control Board
3. District Collectorate, Jaipur

Sites:

1. www.censusindia.gov.in
2. www.rpcb.rajasthan.gov.in

Sample collection stations of air pollutants:-

Ajmeri gate, chandpole, Jhalana doongri, Vishva karma, RICCO

METHODOLOGY

- The study is based on secondary data.
- The Data of population growth and land-use analyzed and compared with charts and tables.
- Six Stations of The data of four major air pollutants NO2, SO2, RSPM, and SPM is analyzed by classifying it into two categories Industrial and Residential and others.
- Annual average data is calculated from average monthly data from the stations.

ANALYSIS OF URBAN GROWTH

The table shows rapid increase in the population. In 1931 population of jaipur city was 144,200, it increased to 304, 6163 in 2011.the decadel growth rate is also high.in jaipur there is a decline in agglomeration in walled city.and outer area of the walled city shows growth of agglomeration

The conversion of Earth's land surface to urban uses is one of the most irreversible human impacts on the global biosphere. It hastens the loss of highly productive farmland, affects energy demand, alters the climate, modifies hydrologic and biogeochemical cycles, fragments habitats, and reduces biodiversity.

In the given diagram in 1971 area under residential sector was only 2023 ha. This sector shows a high growth and in 2011 it increased to 19072 ha. In commercial sector area increased to 1978 ha from 137 ha. Industrial sector shows a high growth from 287 ha to 2119 ha. These are the major changes in land users and others also show

a significant increase.

These land use changes shows impacts on many multiple levels, it increase stress on land resource, water resource, forest ,wild life, and all other natural resources. Increasing no. of vehicles increase air pollution and other disease due to emissions from these vehicles.

ENVIRONMENTAL CHALLENGES: AIR POLLUTION

The rapid increase of urban population and the urbanization leads to an ever increasing demand on the urban environment. Air Pollution is a major problem in cities which causes respiratory & health Problems. Air pollution refers to the release of pollutants into the air that are detrimental to human health and the planet as a whole. Air pollutants may cause disease such as cancer. Reproductive issues, immune system damage and developmental problems. The toxins may be ingested and passed through the ecosystem through surface plants and water by animals and humans, exposing a greater population of organisms to the pollution. Plants affected by pollution have reduced crop yields and contain toxins that are transferred through digestion. Animals may be directly affected by air pollution in their environments. These toxins may build up as they are transferred between organisms in the food chain, leading to future magnified health effects.

AIR QUALITY IN JAIPUR CITY

Years	spm		rspm		So2		Nox	
	industrial	residential and others	industrial	residential and others	industrial	residential and others	industrial	residential and others
2004	358	o266	114	94	7.9	5.4	28.9	25.6
2005	300	302	131	106	9.32	5.57	22.69	29.9
2006	479	263	295	103	13.4	4.16	29.1	28.6
2007	304	256	136	101	6	4.88	27.4	28.55
2008	312	295	158	107	6.35	5.87	38.2	35.9
2009	380	344	182	148	5.84	5.65	38.74	36.16
2010	419	405.25	177	155	5.81	5.855	38.365	38.2
2011	340	334	158.5	150	6.15	6.36	36.875	37.87
2012	350	403	183.5	191	8.74	8.925	50.6	51.49
2013	351	390	182.5	155	7.25	7.2975	37.51	40.787
2014	300	284	169.5	148.75	7.28	7.265	40.225	41.312

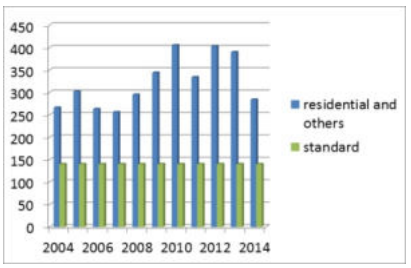
This study is conducted to measure the level of major four air pollutants RSPM, SPM, NO2 and SO2 in the study area. Results are analyzed here:-

The Table reveals that study area is suffering from air pollution. The pollution is largely attributed to RSPM and SPM levels.

1. SUSPENDED PARTICULATE MATTER

SPM stand for Suspended Particulate Matter. They consist of solid particles such as dust and soot that are suspended in the air. They are harmful to all living organisms, in humans they cause diseases such as asthma and lung cancer and in plants they can clog stomata openings and interfere with photosynthesis functions. They also decrease the visibility during winters and may lead to traffic congestions and accidents. Standard limit for SPM in residential area is 120. And in above diagram we can see a very high SPM level in jaipur city. This is a hazards condition for it's residents. This is a harmful condition for all living organism.

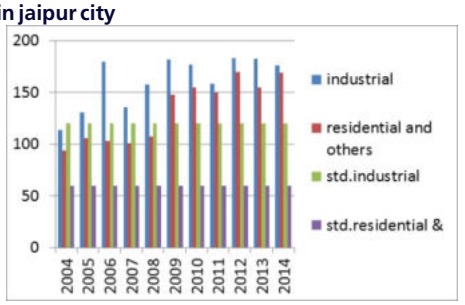
Spm In residential area



2. RSPM

RSPM is that fraction of TSPM (Total suspended particulate matter) which is readily inhaled by humans through their respiratory system and in general, considered as particulate matter with their diameter (aerodynamic) less than 2.5 micrometers. Larger particles would be filtered in the nasal duct. Above diagram shows that RSPM level crossed the standard limits in both residential and industrial areas.

Rspm in jaipur city



RESULT AND DISCUSSIONS

- The Hypothesis is proved right. That growth of cities affect the environment of cites negatively. The case study of Jaipur city reveals that because of the rapid growth of population of the city land use under residential, commercial and industrial category increased, forest cover decreased. And the quality of air affected due to Increasing no of vehicles.
- Unplanned land-use also a reason to mishaps like fire at oil depot 2009 and flood of 1981. From the table we can analyze the change in all four air pollutants at the time of and after this mishap.
- Apart from the diversion of lands for non-agricultural uses, the extensive damage to ecology and environment due to industrial waste, pollution, can also be seen.
- The agricultural area is threatened by construction activities either for residential, commercial transportation or industrial purpose.
- Forest area: Due to some afforestation programme by forest deptt. Area under forest is increasing since 2005.

SUGGESSTIONS

- It is necessary to monitor the land-use and its changes in periodical frame.
- The development of cities should be planned. The master development plan of cities should be implemented properly.
- Development of growth centers of a city is essential.
- Encroachment should be banned.
- There should be a retirement policy for vehicles.
- Bharat stage iv standards should be implemented in Jaipur.

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