

Historical Prognostications of Land Use Changes and Its Implications on Socio-Economic and Ecological Transformations in Bawal Block, Rewari Haryana

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Introduction

Land is an important resource with finite supply, confined within the national territorial boundaries of the countries. It is an important factor in production and its ownership ensures economic prosperity and social status to the land holder. Land has also been the main source of revenue for the state exchequer. Land use involves the management and alteration of natural environment which use by humans to convert it into built environment such as settlements, industrial complexes and arable lands, pastures and fallow lands. Land use is also been defined as “the arrangements, activities and functions, humans undertake in a certain land cover to produce, change or maintain it”. (FAO, 2009). Land Use is determined by environmental factors such as soil profile, climate, topography and vegetation but it also reflects importance of land as a major factor of production. The more significant impact of land use include haphazard urban development leading to urban sprawl, soil erosion, soil degradation, salinization, and desertification. Thus in order to understand the past changes in land use and projecting future land use changes require to understand the relationship of the basic human forces that will increase production and consumption (Pandey, 2014). Land use is a systematic as well as organised arrangement of various classes of land based on certain similar characteristics specifically to identify and understand their fundamental utility, intelligently and effectively in satisfying the needs of human society (Clarke, 1982). Due to the accelerated urbanization in both intensity and area, there is a growing interest in understanding its implications with respect to a major set of environmental factors such as loss of agricultural and arable land decline in natural

vegetation cover and climate at local, regional, and global scale. The conversion of rural areas into urban areas through rampant urbanization is currently occurring at an unprecedented rate in recent human history and has a marked effect on the normal functioning of ecosystems (Turner, 1994). Land use change is one of the most important arena in human induced environmental transformation. (Lambin et al., 2001). Due to population pressure, the demand of society on land, water and biological resources are increasing the degradation rate which affects the stability, sustenance and resilience of our ecosystems, environment and civilization. The appraisal, assessment and management of natural resources involves soil, vegetation, land use and land cover, surface water is essential for its sustainable land use planning (Singh et al. 2009). The city has now become the major social, cultural, and intellectual centre in today’s modern urban society. (Connerton, 2009).

Agriculture land use studies the land under different uses like net sown area, agricultural land, current land other than fallow land, forest land etc. Appraisal, assessment, integration, and management of natural resources that involves landforms, soil, vegetation, land use and land cover, surface water which is essential for its sustainable land use planning (Singh et al.,2009). The land use/land cover pattern of the region is an outcome of natural and socio-economic factors and their judicious utilization by man. Land is becoming a scarce resource due to increasing agricultural and population pressure (Sundara, 2012). The agricultural land use refers to primary use of geographical area for various purposes and activities. Land use is the surface utilization of all developed and vacant land on a specific point at given place and time. (Mandal, 1982). (Ray et al. 2005) used GIS & remote sensing techniques in

order to study crop diversification on the basis of soil and water requirement of different crops in Punjab state. (Sharma et al. 2013) uses GIS techniques for land use/land cover change (LULC) detection in National Capital Region (NCR) Delhi: A case study of Gurgaon District.

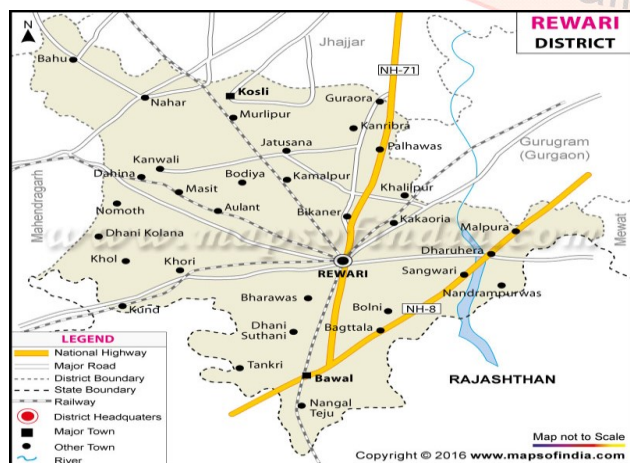
Study Area

Bawal block is situated in the Rewari district of Haryana. It is located at 82 Km milestone in the south-west direction of the National Capital Territory (NCT) of Delhi. Bawal is located at [28°08' N Latitude and 76°58'E Longitude](#). The average elevation of 266 metres. It borders have Rewari Tehsil in the north, Mahendragarh district in west. In south, it borders Rajasthan and is about 7 Km away from Jaipur Highway. The block is well connected with roadways and railway to all major nodes within Haryana, NCR, Punjab, Rajasthan and rest of India. The total length of pukka roads is 102 Km. (Primary Census Abstract, Rewari, 2011)

Bawal is a block in Rewari district of the Indian state of Haryana. It is situated in south-west Haryana 82 km from old Delhi and 51 km from Gurgaon .The latitudinal extent is 28°18'33 ' N and longitudinal extent is 76°01'67'E (Fig 1.1) . The need of the hour is to optimize utilization of land resources, coupled with thorough and careful functional survey of past and present position and its scientific interpretation. (Harmsen, 2002).

DIGITIZE THE NEW MAP . YOU CAN NOT USE DOWNLOADED MAP.

Fig: -1. Location of Selected Villages, Bawal, 2011



Source- Census Administrative Atlas, 2011

Objectives

Present research includes following three objectives;

1. To analyse the changes in the trend of land use pattern in Bawal Block.
2. To examine and analyse the socio-economic and ecological transformation of the block.
3. To suggest the sustainable measures for sustainable land use planning in the study area.

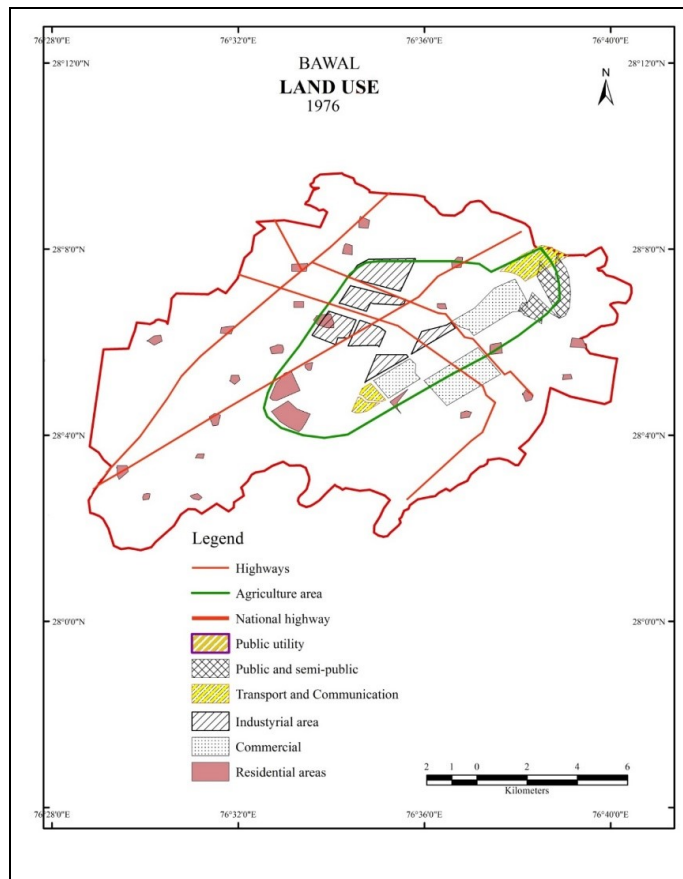
Database And Research Methodology

The study has been comprised of primary as well as secondary data sources which are collected to analyse the desired results. As research methodology forms a vital link between crude data and final analysis. The present study tries to analyse the characteristics of land use, its dynamism with time and its effect on social, economic and ecological dimensions of the block. Secondary data have been used for detailed analysis of geographical background, socio-economic conditions, land use patterns and cropped area. They are collected from various published and non-published records of the Government. Several problems have been faced while collecting secondary data because of non-maintenance of the previous records, changes in administrative boundaries, frequent transfer of the government officials.

Results and Discussions

Dynamics of Land Use in Bawal– This provides insights into the land use in 1976, 1996 and proposed land use change in 2021 and to detect the changes between 1976 and 1996. This section includes classification and explanation of different land use. The different classifications are: - Residential, Build Up, Commercial, Industrial, Transportation, Industrial, Mixed, Agricultural, Cropland, Orchards, Transitional. It also includes land use of 1976, 1996, proposed changes in 2021. The maximum numbers of changes have been observed after 2005.

Fig: 2 Land Use in Bawal, 1976

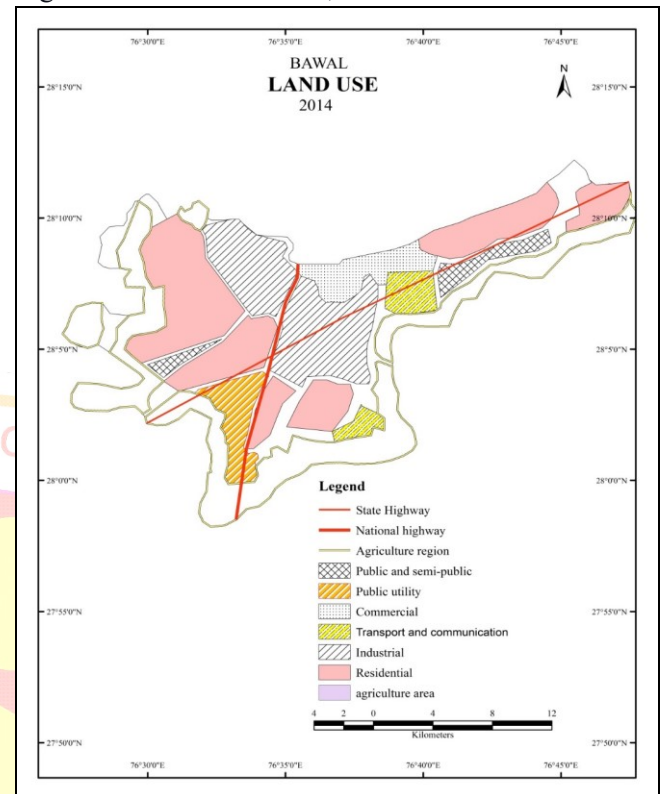


Source- Town and Country Planning, Rewari, 2014

It has been analysed that Residence has maximum area of 645.5 Hect. in 1976 followed by Transport and communication. The density of residence is very high in the region near Bawal (M.C). Because it is an urban area having provisions of necessary amenities like availability of drinking water, access to toilets, provision of all-weather roads etc. The transport zone is accumulated near state highway. Agricultural Zone has been demarcated outside the green boundary. It includes barren land, although small pockets of build-up are dispersed in this zone.

The area under commercial zone has been concentrated in small pockets around highway area. It has 101.5 Hect. in all. It includes Retail Trade, Wholesale and storages, Commercial offices, Cinemas, Parking spaces, Town Parks.

Fig:- 3 Land Use in Bawal, 2014



Source- Town and Country Planning, Rewari, 2014

The study shows that there has been a dynamic change in the land use/land cover in Bawal Block from 1976 to 2014 (Table 1) Present study reveals the urban growth and its Impact on Cityscape.

TABLE 1- Change detection from 1976 to 2014

Land Use Classification	1976 (In Hect.)	2014 (In Hect.)	Change from 1976 to 2014 (In %)
Residence	645.5	9724	14.06
Commercial	101.5	1149	10.32
Industrial	174.5	5247	29.6
Transport and Communication	305.5	4266	12.96
Public Utilities	155.0	696	138.2
Semi-Public and Public	103	944	8.16
Open-Spaces	66	5011	79.92
Agriculture Land	1074	319	-0.70
Total	2474	27056	

Source- Town and Country Planning, Rewari, 2014

Urban growth is a worldwide fact that comes with the land use change, population growth and economic development. Urbanization is a main cause for the block where rate of urban expansion has occurred very fast in the recent time.

The landscape is likely to expand at a very rapid rate. After 1991 new economic reform liberalization, privatization and globalization policies of the government of India and opening up of FDI in real estate sector have brought a vast boom in the development of large scale private industries, industrial parks in study area.

Present time development of industries, education institutions, tourism, hospitals, private residential builders and good road system has contributed the quick urban expansion and land use transformation which influence sustainable use of land. The study also find out that productive agricultural land has been occupied by residential, commercial and industrial sectors which can be credited to the human interventions with the environment.

The extent and pace of urban transformation has made an alarm about the city sustainability. As a result, the valuable urban planning and administration with a target of long term sustainability is required for the monitoring and management of the growing city. These changes may likely to alter the structure, function and complexity of the local ecology. The urban area increased due to migration of people and industrialization. There is need of scientific land use planning in the district due to high urban growth because of falling the district in National Capital Region. Mainly agricultural area, grazing land and wasteland categories have been converted into built-up area during this period.

Economic Transformation due to Land Use Change– The change in the pattern of the social structure has been seen in the study area due to land use change. It is evident through the field survey that the earlier morphology of the house was different as compared to the modern day house. The external structure of the house was different too. The source of the drinking water has been changed from well in 1980's to tap private water supplying from the Rewari district. Moreover, the source of the cooking

fuel has also been changed from cow dung to modern day LPG and smokeless “*chulah*”.

The general level of education is matric pass and mostly males are more literate as compared to females. The interest towards mass media has also been showed by the respondents. The television viewers are more as compared to newspaper readers and radio listeners. The largest chunk of the population comprises of the internet users are mostly youth. The majority religion in the study area is Hindus followed by Muslim, Sikh and Christians.

Social Transformations due to Land Use Changes–It analyses the changes in the attitude towards marriage, family planning, status of the girl child. The occupational structure of respondents is mainly subsistence in nature. Commercial farming, dairy farming provides the maximum livelihood to the respondents. The transformation seen in occupational structure has been transformed from past thirty years. The respondents have changed their jobs mostly from agriculture to services.

Nearly 41 per cent have changed their occupation in between 5 to 10 years. The majority of people are from the villages of Subansiri, Saidpur as these villages are near to the Bawal Municipal Council area. The land transaction is one of the important factor in economic transformation and evolution of occupational structure. The land market depends upon the various factors like economic backgrounds of buyers and sellers, motives behind selling the land etc,

Ecological Transformations due to Land Use Changes The changes has been witnessed in the size of farmhouses, parks, ponds, common property resources in the region due to induced land use changes. Deforestation, urban development, agriculture, and other human activities have modified Earth's landscape. Such disturbance in the system of the land affects important ecosystem processes and services, having long-term consequences.

Forest land provides open space and valuable habitat for many wildlife species. It has long been researched that agricultural land use and practices can cause water pollution. Runoff from agricultural lands is a leading source of water pollution. The conversions of wetlands to crop production and

irrigation water diversion due to land use changes and land modification have brought many wildlife species on the verge of extinction.

The fast pace urban development leads to many environmental problems, including air pollution, water pollution, and shrinking of wildlife habitat. Habitat destruction, fragmentation, and alteration coupled with urban development are the major causes of biodiversity decline and species extinctions

With an increase in commercialization of land, the negative ecological effects are increasing, leading in depleting of groundwater resource, desertification, drought and its effect on declining of water levels in ponds, wells, waterless streams, shortage of drinking water and crop destruction. The decline has been reported in all live stocks flora and fauna. Due to industrialization, the decrease in the size of orchards has been observed. Due to decline in rainfall pattern, the changes in plant species composition in the area are observed. Most of the traditional species are at the verge of extinction due to frequently changing arid climatic conditions. The changing pace of development in the area has increased the anthropogenic interference in forest for their various needs such as fodder, fuel-wood, timber and mining etc.



Sustainable Land Use Planning –Increased dependence on technological innovations including the cropping equipment, irrigation facilities (tube-wells, drip irrigation and sprinkler systems), high yielding seeds and fertilizers has significantly changed the rural economy and environment. This change has clearly shown a declining tree cover and lower groundwater levels. The following recommendations strategy that can be applied in the study area based on the discussion with local respondents.

- ✓ **Stringent Rules and Laws:** People involved in cutting of trees of forest in any other way should be dealt with iron hands. The local judiciary system should be strengthened to punish such people in a specified time framework.

- ✓ **Community Fodder Plantation:** Cultivation of fodder in village common land can reduce pressure on forest for fodder.
- ✓ **Controlled Industrialization:** Infrastructures development needs to be managed properly. Proper caution should be taken in order to promote afforestation.

References

1. Anonymous, Comprehensive District Agricultural Plan, 2007-12: 106-13.
2. Anonymous, Study of Climate Change and its Adverse Effect on Forest Ecosystem and Adaptability of Villagers of Aravalli Hills of Rewari District of Haryana by Regional Centre, National Afforestation and Eco-Development Board, Ministry of Environment & Forests, Government of India (2007).
3. Census Administrative Atlas, 2011
4. Connerton, Paul. *How modernity forgets*. Cambridge University Press, 2009.
5. District Gazzetter, Rewari, 2003
6. Forest Department, Rewari, 2015
7. Harmsen K., Nidhumolu B. N. (2002). "Land use planning for sustainable development in South Asia: An example from India," *IAPRS & SIS*, Vol. 34, Part 7, "Resource and Environment Monitoring," Hyderabad, India. pp 1467-1473.
8. Haryana District Gazetteer, Mahendragarh, Page 1-83
9. Lambin, et al. (2001) . "Agent-Based Models of Land-Use and Land-Cover Change." *Report and Review of an International Workshop*, Irvine, California, USA. pp 1-131.
10. Mandal R.B. "Land Utilization: Theory and Practice". (1982). New Delhi: Concept Publication , pp 1-21.
11. Pandey B.W. 2014. "*Dynamics of Land Use Changes*". Research India Press , New Delhi.
12. Ray S.S., Sood A., Das G., Panigrahy S., Sharma P. K. and Parihar J.S.(2005). "Use of GIS and remote sensing for crop diversification- A case study of Punjab state", *Journal of ISRS*, Vol.33, No1, pp 181-186
13. Singh, A.L, Sharma M.P, and Joshi P.V. (2009) "Changing Land Use Pattern: A Case

Study of Khed Tehsil of The Pune District, Maharashtra State.” *Golden Research Thoughts* IX.

14. Singh, A.L., 2012. *Urban Sprawl: Causes, Consequences and Policies*. B.R. Publishing Corporation, Delhi. pp 17-18.
15. Sundara, K. (2012). “Impact of Urban Sprawl on City Environs: A GIS Based Study of Karnal City, Haryana. India”. *Journal of Water and Land Use Management* 2 (2): pp 1-6.
16. Town and Country Planning, Rewari, 2015
17. Turner, H. (1994). “Land Use Change Detection Through Image Processing and Remote Sensing Approach: A Case Study of Palladam Taluk, Tamil Nadu.” *International Journal of Engineering Research and Applications* pp 289-294.

