



Analysis of Land Use Pattern and Sustainability In Virat Nagar Tehsil, Jaipur District, Rajasthan, India

KEYWORDS

Agriculture, Land use, Economic Factors, Ecological imbalance, Sustainability

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ABSTRACT *In this paper, an attempt has been made to analyze the land use pattern in viratnagar Tehsil and its sustainability. The study is based on secondary data collected from secondary sources. Therefore, viratnagar Tehsil has greater potential to increase agricultural area in order to make the economy and agriculture more sustainable.*

Indian Economy is primarily based on agriculture and its major challenges are-growth, sustainability, efficiency and equity. Reviewing land use pattern it is observed that large forest areas have been converted to cropland creating unprecedented ecological imbalance. In face of increasing demand for food grains intensive agriculture based on irrigation-fertilizer-high yielding seed technology is the common practice and create serious environmental problems. Sustainable agriculture with its emphasis on preservation of ecology, optimization of economic and social benefits and conservation of energy is seen to provide stable and lasting solution.

Introduction

India is a country of about one billion people. More than 70 percent of India's population lives in rural areas where the main occupation is agriculture. Agriculture sector contribution to GDP is nearly 14% and 50 % of the total employment is generated from agriculture. This sector not only fulfils the daily living requirement of population of the country but is also the main feeder of raw materials to all industries.

Land use is the human use of land. Land use involves the management and modification of natural environment or wilderness into built environment such as settlement and semi-natural habitats such as arable fields, pastures and managed woods. Factors affecting land use pattern are relief, soil, climate, capital and land tenure etc. It is only relatively recent phenomenon that large-scale forest areas, grazing land and waste lands have been converted into croplands to support the rising population. In agriculture land use, it is generally viewed a shift from traditionally grown less remunerative crops to

more remunerative crops. Due to variety of seeds, fertilizers and irrigation along with advanced farm equipments. Green revolution is confined to a few crops, viz-wheat, rice and Maize.

Vyas (1996) highlighted in their study that area under superior cereals, i.e. rice and wheat, is increasing while inferior cereals decline after the green revolution.

Kumar (2001) and Deshpande (2004) discussed that the area under more water intensive crops (rice, wheat, sugarcane) increased at the cost of less water intensive crops such as coarse cereals and total pulses.

Amar Singh (2007) briefed in their working paper that many regions in India are reaching the threshold of physical water scarcity.

The present study was designed in specially to see land

use pattern, its impact and sustainability in viratnagar Tehsil, Jaipur District, Rajasthan. Mostly population lives in rural areas (87%) and depends on agricultural activities.

Main Objectives of the Study

The main objectives of the present study are as follow:

1. To study the nature of land use pattern in viratnagar Tehsil.
2. To examine the interrelationship between irrigation facilities and changing of land use pattern.
3. To identify the role of sustainable agriculture in ecological balance.

Study Area:

Virat Nagar is a Tehsil in Jaipur district of Rajasthan state. Viratnagar with a total Geographical area of 482.3 KM Sq. is located 82 km. towards north from district headquarter Jaipur. Viratnagar Tehsil is bounded by Thanagazi Tehsil towards east, shahpura Tehsil towards west, Kotputli & Bansur Tehsil towards north. It is in the 264 m elevation.

The climate of the region is humid subtropical. The mean maximum and minimum temperature are 45° c and 23° c respectively. During winter the minimum temperature reaches to 1°c. The mean annual rainfall is 640 mm. the numbers of rainy days are 36. The co-efficient of variability of annual rainfall is 38%. The average annual relative humidity is 70%. Soils are coarse textured, light brown, very deep, non-calcareous and well drained. The natural vegetation of this region is mixed xenomorphic thorn, forest and woodland.

As per 2011 census the Tehsil has population of 1,66,087 persons with a density of 344 persons/km sq. and decennial growth of 22.40%. The main, marginal and non-working population constitute 31.40%, 10.85% and 57.75% respectively. Literacy rate is 53.72%. The Tehsil has nearby 100 villages. The Tehsil is connected with Jaipur and Alwar by State Highway 13.

Methods and Tools:

Methodology provides a structure and ways for various aspects of the problem which is under consideration that ultimate provides valid generalization about the phenomena.

The present study uses secondary data. The analytical tools have been used for analysis and interpretation of data. Secondary data collected from census department of India and crop Khasara register of Viratnagar Tehsil.

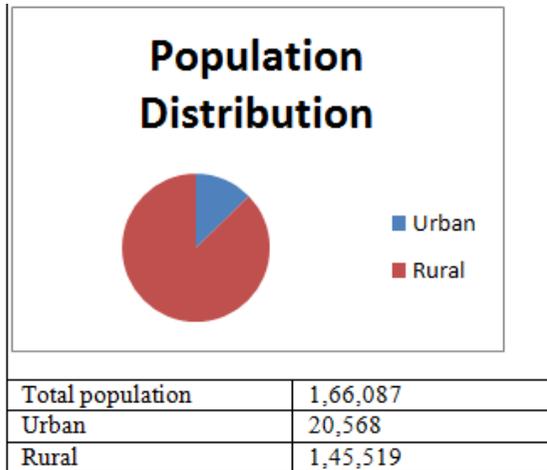
The study examines the agriculture land use pattern such as-

- Absolute area, Proportionate share to gross cropped areas (GCA).
- Relationship between irrigation and land use.

Result and discussion

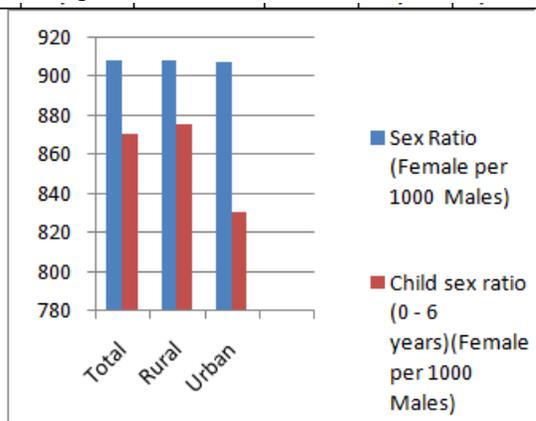
Population: Urban, Rural, Cultivators & Agricultural labour:As per census 2011, the population of viratnagar Tehsil was 1,66,087 out of which 87.61 percent was rural population. The overall sex ratio of the population of viratnagar (number of females per thousands males) was lower(907.5) than Rajasthan (926) in 2011. The literacy rate of viratnagar was very low 53.72% of which the male and female literacy rates were 66.53% and 39.61% respectively.

Figure1: Population distribution in Viratnagar Tehsil 2011



Source: Census Department of Rajasthan, Jaipur

Figure2: Child sex ratio (0-6 years) and overall sex ratio -Viratnagar 2011



Source: Census Department of Rajasthan, Jaipur

It can be seen in Table 1 that total number of cultivators was 39,042 constituting about 23.50% of total population of the state. Cultivators in rural areas were 37,210 in number constituted about 95.30% of total rural population in the Tehsil. Among the cultivators, about 18,806 were women constituting about 48.16% of total cultivators in the viratnagar Tehsil. On the other hand, the total numbers of agricultural labour in viratnagar were 6722, out of which 3806 were women constituting about 56.62% of total agriculture labours in the Tehsil

Table 1: Composition of population in Viratnagar Tehsil (2011)

| S.No. | T/R/U | Persons | | % of total | Males | Females |
|------------------------------------|-------|----------|--------------------|------------|--------|---------|
| | | | No. of cultivators | | | |
| 1. | Total | 39,042 | 100.00 | 23.50 | 20,236 | 18,806 |
| 2. | Rural | 37,210 | 95.30 | 25.87 | 19,341 | 17,870 |
| 3. | Urban | 1,832 | 4.70 | 8.90 | 900 | 936 |
| No. of Agricultural Labours | | | | | | |
| 4. | Total | 6,722 | 100.00 | 4.04 | 2,916 | 3,806 |
| 5. | Rural | 5,579 | 83.00 | 3.83 | 2,433 | 3,146 |
| 6. | Urban | 1,143 | 17.00 | 5.57 | 483 | 662 |
| Others (Other workers+non-workers) | | | | | | |
| 7. | Total | 1,20,323 | 100.00 | 72.44 | 63,917 | 56,406 |
| 8. | Rural | 1,02,730 | 85.37 | 70.45 | 54,498 | 48,231 |
| 9. | Urban | 17,593 | 14.63 | 85.53 | 9,414 | 8,173 |
| Total Population | | | | | | |
| 10. | Total | 1,66,087 | 100.00 | 100.00 | 87,069 | 79,018 |
| 11. | Rural | 1,45,519 | 87.61 | 100.00 | 76,272 | 69,247 |
| 12. | Urban | 20,568 | 12.39 | 100.00 | 10,797 | 9,771 |

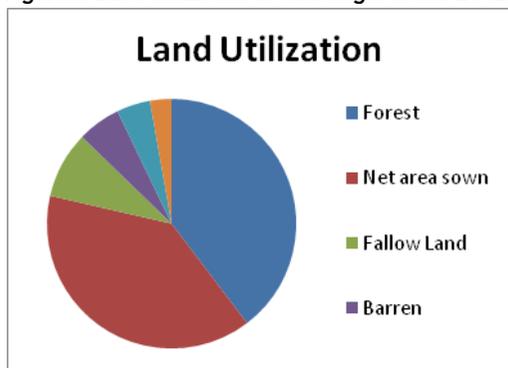
Source: Census Department, Rajasthan

Notes: T, R and U stands for Total, Rural and Urban respectively: Figures are percentage to total population of respective category.

Land use Pattern:

Different uses of land-forests, pastures, human habitations and various economic activities,agriculture is the prime one and most important for the survival of the mankind. Viratnagar has 48,236 Ha Geographical areas. At present viratnagar, Tehsil has 39.55% forest cover, 4.37% Pastures and grazing land, 38.89% area is under agriculture use, 5.62% land is barren, 2.80% land is cultivable wasteland and remaining 8.60% is fallow land.

Figure3: Land utilization in Viratnagar Tehsil 2012-2013



Source: Crop Khasara Register, Tehsil Viratnagar

Area under forest in Viratnagar Tehsil is high due to its vast hilly area. Land not available for cultivation includes barren lands, permanent pastures and lands under miscellaneous tree crops and grasses. There is high concentration of uncultivated land due to barren land. In arid regions, except in the villages where irrigation is practiced, the extent of such fallow land is very high due to low water table. The high density of cultivated land in some villages is mostly due to deep alluvial soil, moderate rainfall by hills and good irrigation potentialities.

Table2: Land classification in Viratnagar Tehsil 2012-13

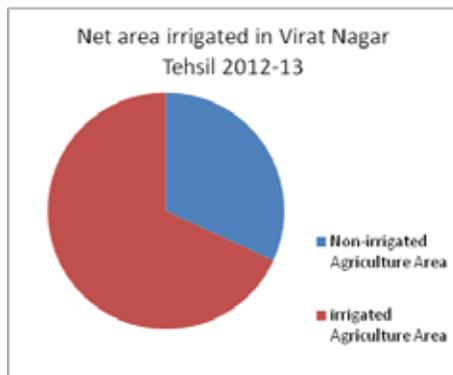
| S.No. | Classification of reporting area | Total area (in Hects.) | % of total |
|-------|----------------------------------|------------------------|------------|
| 1. | Forest Cover | 19,080 | 39.55% |
| 2. | Pasture and grazing land | 2112 | 4.37% |
| 3. | Agriculture uses | 18760 | 38.89% |
| 4. | Barren land | 2714 | 5.62% |
| 5. | Cultivable Waste land | 1318 | 2.80% |
| 6. | fallow Land | 4152 | 8.60% |
| | Total | 48236 | 100% |

Source: Khasara registers Tehsil Viratnagar

The land area under agriculture use in viratnagar (39%) is much large compared to world (11%). The area under agriculture has increased after 1951-52. This increase in agriculture land is largely as a result of clearance of forest under population pressure.

The irrigation facilities are available in 12,776 Hects. area that are 70% of net sown area.

Figure 4: Net area irrigated in Viratnagar Tehsil 2012-13



Source: Crop Khasara Register Tehsil Viratnagar

Massive deforestation has resulted into serious problem of environmental instability and ecological imbalance including atmosphere pollution. The run-off rainwater from denuded areas have disastrous effects on the cultivated lands of the plains.

Unlike forests, grazing lands are open spaces and are more attractive for human occupation. Often they are converted to croplands, urban areas and other human dominated structures. Area under grazing lands has gradually declined and has been converted to cropland.

Intensive agriculture:

After green revolution, irrigation facilities are provided to crops due to high yield variety seeds. In viratnagar Tehsil, 14801 Hects. Area is sown more than once.

Figure5: Irrigated area in viratnagar Tehsil 2012-2013.

| | Irrigated (in Hects.) | Non- Irrigated (In Hects.) | Total |
|-----------------------------|-----------------------|----------------------------|-------|
| Cultivated(Gross Sown area) | 15351 | 18201 | 33552 |
| Sown more than once | 2575 | 12226 | 14801 |
| Net sown area | 12776 | 5975 | 18751 |

Source: Khasara Resister Tehsildar Office, Viratnagar

As for agriculture land, there is hardly scope for further expansion; on the contrary there has been marginal decline in the crop area due to construction activities on prime agriculture land on account of urban expansion and industrialization etc. lands are already under cultivation and with growing population the per capita availability of cropland is bound to fall. In order to meet the food requirement of growing population the yield of the cropland must be increased with the use of irrigation, fertilizer, pesticide and high-yielding variety of seeds, but intensive agriculture has its own limitations and problems.

- New High- Yielding varieties of seeds are "High responders" rather than "High Yielder", i.e. with increasing amount of fertilizer and water they respond more efficiently and yield is higher than other varieties. Under poor conditions, i.e. in absence of sufficient water and fertilizer these seeds do not give higher yield compared to traditional crop.
- High dose of fertilizers causes faster depletion of soil nutrients.
- By crop breeding new varieties will continue to be produced. The world native crop varieties are being re-

placed by these new crops. Many indigenous crop species have been lost.

- With a single crop variety all over the fields there is real risk, since some disease might damage the entire crop resulting in complete dislocation of production.
- Poor farmers cannot afford high value farm equipment, fertilizer, pesticides and higher yielding seeds and thus only rich farmers are able to participate the green revolution.
- Most farmers over water in the fields often resulting in water logging, irrigation with saline water results in Salinization that kill plants.
- Fertilizer from fields join the run-off and pollute the aquatic ecosystem, nitrate levels in groundwater have been found to be too high to be safe in many places where intensive agriculture is practiced.

So the intensive agriculture does not providing the lasting solution. The ways to make agriculture more stable and renewable is sustainable agriculture.

Sustainable Agriculture:

The sustainable agriculture may be defined as any set of agronomic practices that are economically viable, environmentally safe and socially acceptable.

The sustainable agriculture is biological focused and hope to reduce but not necessary eliminate chemical use. In the context of sustainable agriculture another term "Alternative agriculture" has been prominently used. Any food productions that has-

- Reduced use of off-farm inputs with less harm to environment and consumers.
- A more productive use of biological and genetic potential of plants and animals,
- A better match between cropping pattern and the physical capacity of lands and
- An improved emphasis on conservation of soil, water, energy and biological resources is defined as alternative agriculture.

Sustainable practices will vary by Cropping system, Local environment and Socio-economic system.

Conclusions and Recommendations:-

After independence, increase in agricultural land is largely as a result of clearance of forest under population pressure. Large forest areas have been converted to cropland and resulted into serious problems of environmental instability and ecological imbalance including atmospheric pollution. The proportion of land under agriculture use in Viratnagar (39%) is much larger compared to world (11%).

In many regions of our own country intensive agriculture can be used to increase the farm production but it is harmful for ecosystem. So we should use to sustainable agriculture techniques that are more stable and renewable.

For the sustainability in agriculture, these are the following recommendations:-

- ❖ Field should be protected with bunds to avoid the loss of nutrients and fertilizers with the run-off rain water.
- ❖ As far as possible animal and green manures should be used which is possible with mixed farming involving crops, trees and animals.
- ❖ Diversification and rotation of crops.
- ❖ Harvesting of rain water to improve the availability of water.

As to get good yield even from rain fed areas and popularizing farm practices focusing preservation of ecology, optimization in use of labour and machines and conservation of energy.

In sort, a small farm management to improve productivity, profitability, and sustainability of the farming system will go a long way to ensure the all round sustainability.

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