



Management of Land Use Patterns in Siwan District: A Critical Analysis

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ABSTRACT

Land in Siwan is scarce with an estimated area of 222051 hectares. The Physical and socio- cultural environmental pressures have a significance influence on land use pattern which leads not only to shrink in the per capita availability of land and foodgrains, it is the need of an hour to analyze the management of land use patterns particularly in agro dominant districts like Siwan. In the research paper an attempt has been made to analyze the management of land use patterns in Siwan District, Bihar. The land use pattern displays the positive and negative changes in most of the land use categories, which highlight management trends of land use patterns.

KEYWORDS :

Introduction

Land is regarded as one of the most important resources of an area. It is used for different purposes like cultivation, plantation, and other human development activities, which are totally regarded as land use and its type and distribution is known as land use pattern. The land use pattern is complex and dynamic in nature. The increasing pressure of population on agriculture not only best lands brought under cultivation but also physical unsuitable lands are put to intensive uses in the study area. Thus, the population increase leads to a major shift in the pattern of land use (Shamsul Haque Siddique, 2013; 353) and the changes in land use pattern may be inspired by the technological changes in irrigation facilities etc.

Study Area:

Siwan District is a part of north- west alluvial plain in the interfluvial region of the river Ghaghara and Gandak between 23°53' to 26° 23' N Latitude and 84°00' to 84° 47' E longitude and covers 2220.51 sq. Km, nearly 2.36% of the total geographical area of the state with 19 C.D blocks and 1530 villages. The district accommodates 3330464 people with 3.21% of the total population of the state and population density is 1223 person /sq. Km.



Objectives of the Study:

The objectives of present study are as follow:

- 1. To study the proportion of area under different land use categories during investigation period.
- 2. To identify the positive and negative changes in land use pattern.
- 3. To assess the proportion of and shifts in put to non-agricultural uses.
- 4. To find out spatial and temporal variation in land use pattern.

Data Base and Methodology

The data for present study is based on secondary data. This data is Non Government Organizations. The block is considered as a real unit of investigation. The block wise data has been analyzed with 15 C.D block in both period of 1986-87 and 2012-13.This study is analyzed by simple cartographic techniques and simple statistical methods.

Results and Discuss

The proper and optimal utilization is of even more critical value for regions solely based on agriculture. So, the efficiency of land use plays an effective role in the socio-cultural environment for planning and management of land resources.

It is evident from Table -1 that the temporal and spatial land use pattern exhibits the extensive area of the is used for agricultural purposes and the percentage of each category to total area with positive and negative changes, which indicates the changing trends of land use management in study area. Regarding this concept the management of land use pattern can be discussed below:

Table - 01
Temporal Variation in Land Use in Siwan District, 1986-87 to 2012-13

| Table - 01 | | | | | | | |
|--|-------------------------------------|---------|-----------|---------|-----------|-------------------|--------|
| Temporal Variation in Land Use in Siwan District, 1986-87 to 2012-13 | | | | | | | |
| (Area in Hectares) | | | | | | | |
| S. N. | Land Use Classes | 1986-87 | | 2012-13 | | Changes 1986-2013 | |
| | | Area | % of T.A. | Area | % of T.A. | Absolute | % |
| Total Geographical Area | | 222051 | 100.0 | 222051 | 100.0 | - | - |
| 1 | Forest | - | - | - | - | - | - |
| 2 | Area Not Available for Cultivation | 34929 | 15.73 | 36937 | 16.63 | +2008.3 | +57.50 |
| | (a) Barren and Uncultivated Land | 7599 | 3.42 | 5543.4 | 2.49 | -2055.58 | -27.05 |
| | (b) Land Put to Non-agriculture use | 27330 | 12.31 | 31394 | 14.14 | +4063.88 | +14.60 |

| | | | | | | | |
|--|--|--------|-------|--------|-------|-----------|---------|
| 3 | Other Uncultivated Lands Excluding Fallow Land | 5549 | 2.49 | 7465.1 | 3.36 | +1916.09 | +34.53 |
| | (a) Permanent Pasture and Other Grazing Land | 133 | 0.06 | 447.08 | 0.20 | +314.08 | +236.15 |
| | (b) Land Under Miscellaneous Trees & Groves | 5008 | 2.25 | 6653.7 | 3.00 | +1645.66 | +32.86 |
| | (c) Cultivated Waste Land | 408 | 0.18 | 363.35 | 0.16 | -44.65 | -10.94 |
| 4 | Total Fallow Land | 10800 | 4.86 | 11821 | 5.32 | +1021.12 | +9.45 |
| | (a) Current Fallow Land | 9492 | 4.27 | 8891.5 | 4.00 | -600.55 | -6.23 |
| | (b) Other Fallow Land | 1308 | 0.59 | 2929.7 | 1.32 | +1621.67 | +123.98 |
| 5 | Net Sown Area | 173232 | 78.01 | 164004 | 73.86 | -9228.42 | -5.33 |
| 6 | Area Sown More than Once | 80952 | 36.45 | 99676 | 44.89 | +18724.34 | +23.13 |
| Source: Unpublished Data of D.A.O., Siwan, 2013. + Denotes increase - Denotes decrease | | | | | | | |

Area Not Available For Cultivation

This category of land is occupied by barren and uncultivated land and land put to non-agricultural use. From 1986-87 onwards area under this category has been steadily increasing from 15.73 percent to 16.63 percent in 2012-13 of the total area. In 1986-87, the highest area has found in Raghunathpur block with 2.82% and lowest in Guthani block with 0.34%. In 2012-13, highest area has found in Darauli block with 2.23% and lowest has recorded in Siswan block (0.36%). It is positively increased in areas with 0.90% from 1986-87 to 2012-13 due to expansion of human settlements, development of human activities such as construction of roads, railways, canals and establishment of small scale industries etc. The overall change under this category has recorded with positive changes with 5.75 percent of total area in the investigation period.

Table - 2

Block wise Distribution of Area Not Available for Cultivation in Siwan District, 1986-87 and 2012-13

(Area in Hectares)

| Sl. No. | Blocks | Area in Hectares | 1986-87 | | | | | | 2012-13 | | | | | |
|----------------|----------------|------------------|------------------------------------|--------|-------------------------------|--------|---------------------------|--------|------------------------------------|--------|-------------------------------|--------|---------------------------|--------|
| | | | Area Not Available for Cultivation | | Barren and Uncultivated Lands | | Land Put to Non-agri. Use | | Area Not Available for Cultivation | | Barren and Uncultivated Lands | | Land Put to Non-agri. Use | |
| | | | Area | % T.A. | Area | % T.A. | Area | % T.A. | Area | % T.A. | Area | % T.A. | Area | % T.A. |
| 1 | Siwan | 12148 | 1944 | 0.88 | 85 | 0.04 | 1859 | 0.84 | 1611.63 | 0.73 | 142.21 | 0.06 | 1469.42 | 0.67 |
| 2 | Pachrukhi | 15017 | 1799 | 0.81 | 30 | 0.01 | 1769 | 0.80 | 1849.23 | 0.83 | - | - | 1849.23 | 0.83 |
| 3 | Daraundha | 14894 | 1562 | 0.70 | - | - | 1562 | 0.70 | 2091.71 | 0.94 | 112.61 | 0.05 | 1979.10 | 0.89 |
| 4 | Maharajganj | 11606 | 1794 | 0.81 | 61 | 0.03 | 1733 | 0.78 | 2411.66 | 1.08 | 840.11 | 0.38 | 1571.55 | 0.70 |
| 5 | Basantpur | 6220 | 1617 | 0.73 | 36 | 0.02 | 1581 | 0.71 | 956.84 | 0.43 | 293.22 | 0.13 | 663.62 | 0.30 |
| 6 | Goriakothi | 13676 | 1805 | 0.81 | - | - | 1805 | 0.81 | 2344.30 | 1.06 | - | - | 2344.30 | 1.06 |
| 7 | Bhagwanpur | 14828 | 1925 | 0.87 | - | - | 1925 | 0.87 | 2357.46 | 1.06 | - | - | 2357.46 | 1.06 |
| 8 | Barharia | 17732 | 2201 | 0.99 | 739 | 0.33 | 1462 | 0.66 | 2349.62 | 1.06 | 332.78 | 0.15 | 2016.84 | 0.91 |
| 9 | Hussainganj | 9540 | 2001 | 0.90 | 40 | 0.02 | 1961 | 0.88 | 1158.90 | 0.52 | 76.57 | 0.03 | 1082.33 | 0.49 |
| 10 | Andar | 7195 | 2013 | 0.91 | 468 | 0.21 | 1545 | 0.70 | 1563.55 | 0.70 | 973.41 | 0.44 | 590.14 | 0.26 |
| 11 | Siswan | 12799 | 3343 | 1.50 | 11 | 0.01 | 3332 | 1.50 | 792.44 | 0.36 | 451.13 | 0.20 | 341.31 | 0.16 |
| 12 | Raghunathpur | 19120 | 6255 | 2.82 | 4464 | 2.01 | 1791 | 0.81 | 3098.64 | 1.40 | - | - | 3098.64 | 1.40 |
| 13 | Mairwa | 6813 | 2793 | 1.26 | 72 | 0.03 | 2721 | 1.22 | 1692.69 | 0.76 | - | - | 1692.69 | 0.76 |
| 14 | Guthani | 9169 | 758 | 0.34 | 49 | 0.02 | 709 | 0.32 | 1455.83 | 0.66 | 400.13 | 0.18 | 1055.70 | 0.48 |
| 15 | Darauli | 16571 | 3119 | 1.40 | 1544 | 0.69 | 1575 | 0.71 | 4965.86 | 2.23 | - | - | 4965.86 | 2.23 |
| 16 | Hasanpura | 5000 | - | - | - | - | - | - | 1661.57 | 0.75 | 1661.57 | 0.75 | - | - |
| 17 | Nautan | 12000 | - | - | - | - | - | - | 1477.07 | 0.66 | 26.82 | 0.01 | 1450.25 | 0.65 |
| 18 | Lakri Nabiganj | 9795 | - | - | - | - | - | - | 950.75 | 0.43 | - | - | 950.75 | 0.43 |
| 19 | Ziradei | 7908 | - | - | - | - | - | - | 2147.55 | 0.97 | 232.86 | 0.11 | 1914.69 | 0.86 |
| District Total | | 222051 | - | - | - | - | - | - | 36937.30 | 16.63 | 5543.42 | 2.49 | 31393.88 | 14.14 |

Source: Zeanswars, 1986-87 and 2012-13.
- denotes not available.

Barren and Uncultivated land

This category of land use includes barren and uncultivated land in mountain and hill slopes, deserts, plateaus, rocky areas and extremely degraded lands (Siddiqui, Aktar and Ahmad, 2013:361). This category of land has continuously declined in the area from 7599 hectares (3.42 percent) in 1986-87 to 5543.42 hectares (2.49 percent) in 2012-13. These lands have declined with the negative changes of 27.05 percent of the total area. In 1986-87, highest proportion of area was recorded in Raghunathpur block (2.01%) due to bad irrigation facilities, while lowest proportion of area was Pachrukhi block (0.01%). In 2012-13, highest proportion of area is Hasanpura block (0.75%). Goriakothi, Bhagwanpur, Lakri Nabiganj block had not found barren and uncultivated land. These types of lands are found due to improved use of pesticides and better irrigational facilities. Thus, the overall changes have found with positive changes (14.60%).

Land put to non-agricultural use

This land use category includes the lands occupied by human settlements, road and railways or water bodies, i.e; rivers, lakes, ponds, ponds, canals etc. (Siddiqui, Aktar, Ahmad, 2013:358). Such lands have sharp increased in 1986-87 and 2012-13 with 12.31 percent and 14.14 percent respectively. Thus, the overall changes have found with positive changes (14.60 percent). In 1986-87, high proportion of non-agricultural use were recorded in Siwan (1.50 percent) followed by Mairwa (1.22 percent), Hussainganj (0.88 percent), Bhagwanpur Hat (0.87 percent), Siwan (0.84 percent), Goriakothi (0.81 percent), Pachrukhi (0.80 percent), Maharajganj (0.78 percent) and remaining areas are Basantpur and Darauli (0.71 percent each), Barharia (0.66 percent), Andar (0.70 percent), Guthani (0.32 percent). Apart from it, the existing land put to non-agriculture use with highest areas are Darauli (2.23 percent), Raghunathpur (1.40 percent), Goriakothi (1.06 percent), Bhagwanpur Hat (1.06 percent), Barharia (0.91 percent), Daraund-

ha (0.89 percent), which constitute 53.39 percent of the total area of this land and remaining block constitutes 46.61 percent of the total area with Siwan (0.67 percent), Pachrukhi (0.83 percent), Maharajganj (0.70 percent), Basantpur (0.30 percent), Hussainganj (0.49 percent), Andar (0.26 percent), Siswan (0.16 percent), Mairwa (0.76 percent), Guthani (0.48 percent), Nautan (0.65 percent), Lakri Nabiganj (0.43 percent), Ziradei (0.86 percent) under this category. The highest and lowest proportion of area found in Darauli block and Basantpur block respectively.

Other Uncultivated lands

Other uncultivated lands include land occupied by permanent pasture and other grazing land, land under miscellaneous trees, crops and groves and cultivated waste land. There has been a steady increase of area from 2.49 percent to 3.36 percent of total geographical area during the period under study. The positive change has been found from 1986-87 to 2012-13 with 34.53 percent of the total area.

Permanent Pasture and Other Grazing Land

This land use category includes all grazing lands, whether permanent pastures, meadows or not. This category has increased from 0.06 percent in 1986-87 to 0.14 percent in 2012-13. Highest proportion was recorded in the block of Basantpur (41 hectares). There are seven blocks namely, Pachrukhi, Daraundha, Goriakothi, Siswan, Raghunathpur, Guthani, Darauli, which had no land use under this category. In 2012-13, highest proportion has recorded in Guthani block (158.48 hectares). There are thirteen blocks have recorded under this land use category. These lands are Pachrukhi, Daraundha, Basantpur, Goriakothi, Hussainganj, Andar, Siswan, Mairwa, Darauli, Hasanpura, Nautan, Lakri Nabiganj, Ziradei etc.

Table – 3
Block wise Distribution of Other Uncultivated Lands Excluding Fallow Land in Siwan District, 1986-87 & 2012-13

| (Area in Hectares) | | | | | | | |
|--------------------|----------------|--|--------------------------------|-----------------------|--|--------------------------------|-----------------------|
| Sl. No. | Blocks | 1986-87 | | | 2012-13 | | |
| | | Permanent Pasture and Other Grazing Land | Land Under Mis. Tress & Groves | Cultivated Waste Land | Permanent Pasture and Other Grazing Land | Land Under Mis. Tress & Groves | Cultivated Waste Land |
| 1 | Siwan | 2 | 156 | 1 | 1.03 | 176.53 | - |
| 2 | Pachrukhi | - | 385 | - | - | 244.15 | - |
| 3 | Daraundha | - | 219 | - | - | 609.13 | - |
| 4 | Maharajganj | 2 | 296 | 6 | 56.74 | 123.65 | 9.11 |
| 5 | Basantpur | 41 | 670 | - | - | 138.55 | - |
| 6 | Goriakothi | - | 227 | - | - | 211.70 | - |
| 7 | Bhagwanpur | 32 | 435 | - | 98.84 | 567.56 | 27.74 |
| 8 | Barharia | 10 | 427 | - | 19.95 | 422.58 | - |
| 9 | Hussainganj | 10 | 275 | - | - | 138.85 | 8.07 |
| 10 | Andar | 14 | 468 | 101 | - | 281.46 | 280.94 |
| 11 | Siswan | - | 296 | 236 | - | 493.99 | - |
| 12 | Raghunathpur | - | 464 | - | 117.04 | 40.17 | - |
| 13 | Mairwa | 22 | 450 | 61 | - | 497.90 | - |
| 14 | Guthani | - | 194 | 3 | 153.48 | 168.84 | 0.32 |
| 15 | Darauli | - | 46 | - | - | 611.13 | 427.00 |
| 16 | Hasanpura | - | - | - | - | 769.77 | - |
| 17 | Nautan | - | - | - | - | 367.62 | - |
| 18 | Lakri Nabiganj | - | - | - | - | 474.34 | - |
| 19 | Ziradei | - | - | - | - | 315.74 | 32.90 |
| District Total | | 133 | 5008 | 408 | 447.08 | 6653.66 | 363.35 |

Source: Unpublished Data of D.A.O., 2013, Compiled by Research Scholar.
- Denotes not available.

Land under Miscellaneous Trees & Groves

Such lands are occupied by miscellaneous trees, crops and groves, which comprise 6653.66 hectares or 3 percent of the total geographical area in 2012-13. These lands were 5008 hectares or 2.23 percent of total geographical area in 1986-87. It has increased up to 1645.66 hectares during investigation periods. The highest proportion of the area was recorded in Basantpur block in 1986-87, while Darauli has highest proportion of the area is recorded in 2012-13.

Cultivated Waste land

These lands include alkaline and saline lands, which could be made cultivable after treatment. In 1986-87, such lands cover 408 hectares of land, which provides 0.18 percent of the total geographical area. In 2012-13, there are 363.35 hectares of cultivated waste land, which provides 0.16 percent of the total geographical area. Cultivated waste land has decreased with 10.94 percent the period under study.

Fallow land

These fallow lands are those lands, which are applied to lands under cultivation or ploughing, un-cropped or partially cropped for one and more season or sometimes for a shorter period of one year to five years, which has been sown in the part is called fallow land. The duration of this lands are different in different parts of the countries. Regarding these views, total area was recorded with 10800 hectares in 1986-87, while there is 11821.12 hectares (5.32%) in 2012-13. The overall change has found with (+) 9.45 percent of total area under study.

The largest total fallow land had been in Andar (1979 hectares) block in 1986-87 and Lakri Nabiganj (2064.63 hectares) block in 2012-13. These lands can be studied to categorise into two parts:

Table – 4

Block wise Distribution of Total Fallow Land in Siwan District, 1986-87 and 2012-13

(Area in Hectares)

| Sl. No. | Blocks | Area in Hectares | 1986-87 | | | | 2012-13 | | | |
|----------------|----------------|------------------|---------------------|-------------------|-------------------|-----------|---------------------|-------------------|-------------------|-----------|
| | | | Current Fallow Land | Other Fallow Land | Total Fallow Land | % of T.A. | Current Fallow Land | Other Fallow Land | Total Fallow Land | % of T.A. |
| 1 | Siwan | 12148 | 160 | 63 | 223 | 0.10 | 340.48 | 202.88 | 543.36 | 0.24 |
| 2 | Pachrukhi | 15017 | 310 | 4 | 314 | 0.14 | 446.12 | 256.35 | 702.47 | 0.31 |
| 3 | Daraundha | 14894 | 403 | 93 | 496 | 0.22 | 5.95 | - | 5.95 | - |
| 4 | Maharajganj | 11606 | 545 | 9 | 554 | 0.24 | 291.46 | 7.04 | 298.50 | 0.13 |
| 5 | Basantpur | 6220 | 451 | 203 | 654 | 0.29 | 133.69 | - | 133.69 | 0.06 |
| 6 | Goriakothi | 13676 | 87 | 244 | 331 | 0.15 | 968.72 | 333.55 | 1302.27 | 0.58 |
| 7 | Bhagwanpur | 14828 | 447 | 13 | 460 | 0.20 | 514.00 | 326.63 | 840.63 | 0.38 |
| 8 | Barharia | 17732 | 415 | 9 | 424 | 0.19 | 768.15 | 133.65 | 901.80 | 0.41 |
| 9 | Hussainganj | 9540 | 915 | 111 | 1026 | 0.46 | 172.48 | 21.17 | 193.65 | 0.08 |
| 10 | Andar | 7195 | 1665 | 114 | 1776 | 0.80 | 770.60 | 900.55 | 1671.15 | 0.75 |
| 11 | Siswan | 12799 | 1020 | 181 | 1201 | 0.54 | 1271.20 | 120.23 | 1391.43 | 0.63 |
| 12 | Raghunathpur | 19120 | 1300 | 83 | 1383 | 0.62 | 850.81 | - | 850.81 | 0.38 |
| 13 | Mairwa | 6813 | 515 | 22 | 537 | 0.24 | - | - | - | - |
| 14 | Guthani | 9169 | 530 | 30 | 560 | 0.25 | - | 473.80 | 473.80 | 0.21 |
| 15 | Darauli | 16571 | 729 | 199 | 928 | 0.42 | 47.45 | 8.74 | 56.19 | 0.02 |
| 16 | Hasanpura | 5000 | - | - | - | - | - | - | - | - |
| 17 | Nautan | 12000 | - | - | - | - | - | 28.81 | 28.81 | 0.01 |
| 18 | Lakri Nabiganj | 9795 | - | - | - | - | 2064.63 | - | 2064.63 | 0.93 |
| 19 | Ziradei | 7908 | - | - | - | - | 245.71 | 116.27 | 361.98 | 0.16 |
| District Total | | 222051 | 9492 | 1308 | 10800 | 4.86 | 8891.45 | 2929.67 | 11821.12 | 5.32 |

Source: Unpublished Data of D.A.O., 2013, Compiled by Research Scholar.
- Denotes not available.

Current Fallow land

This land use category represents to all such type lands, which were not under crops at the time of reporting but which is kept fallow for sowing during current year. This land use category has 8891.45 hectares of land, which is about 4.00 percent of the total area of the district in 2012-13. But, 9492 hectares of land was under such lands, which constitutes about 4.27 percent of the total area of the district in 1986-87. It has sprung up about 0.27 percent from 1986-87 to 2012-13. Siwan, Pachrukhi, Goriakothi, Bhagwanpur Hat, Barharia, Siswan blocks have seen the growth in this land use category. It has increased as (180.48 hectares), (136.12 hectares), (188.72 hectares), (67 hectares), (353.15 hectares), (251.20 hectares) respectively. The area of this land of Daraundha, Maharajganj, Basantpur, Hussainganj, Andar, Raghunathpur, Darauli blocks have decreased during the investigation period.

A decreasing trend in the area under current fallow land can be noted during 1986-87 and 2012-13. It ranges from 9492 hectares (4.27 percent) to 8891.45 hectares (4.00 percent) during this period. Thus, the overall negative changes has found with 6.33 percent of total area under study.

Other Fallow Land

This land use category includes such lands for cultivation but temporarily out of cultivation for the period of not less than one year and more than five years. Poor fertility, object poverty of cultivators, inadequate supply of water, sitting of canals and rivers are considered under this land. As temporal, area under this land accounts for 1308 hectares with 0.59 percent in 1986-87, while 2929.67 hectares with 1.32 percent of the total geographical area in 2012-13. It has increased 162.67 hectares with 123.98 percent of the total area from

1986-87 to 2012-13. In 2012-13, highest increasing trend has been found in Andar. Thus, Siwan, Pachrukhi, Goriakothi, Bhagwanpur, Barharia, Andar, Guthani have increased as well as Hussainganj, Daraundha, Maharajganj, Basantpur, Siswan, Raghunathpur, Mairwa blocks have decreased in areas during the same period. No such land is recorded in Daraundha, Basantpur, Raghunathpur, Guthani block in 2012-13.

Such land has increased from 1308 hectares (0.59 percent) to 2929.67 hectares (1.32 percent) during the period under study. The overall positive changes have been seen with 123.98 percent of the total area.

Net Sown Area

Net sown area refers to the past cultivated land on which sowing is actually done at least once during a year (Dhian, 1991; 50)

Table-5 exhibits that the intensive area of the land is used for agricultural purposes and percentage of each category to the total geographical area. With these view, 78.01 percent of total area are engaged in net sown area in 1986-87 and after that declining trend in the area is noted. It reached only 73.86 percent of the total in the year 2012-13. The decreasing trend has found with 5.33 percent of total geographical area from 1986-87 to due to the process of urbanization and pressure of population and development activities of the study area. In 1986-87, the net sown area was recorded with 173232 area was 15160 hectares with 6.83 percent of the total area, while in 2012-13, it has recorded as 164003.58 hectares with 73.86 percent of the total area. The highest percentage of the area has found in Barharia block with 6.28 percent of the total area, while Nautan has lowest percentage in net sown area. A continuous region of high net sown area extends diagonally and drastically in the bank of river of Siwan and Chapra district.

Land Sown more than once

Siwan district has experienced drastic change in this land use category. This land use was 80952 hectares with 36.45 percent of the total area in 1986-87, while it has obtained 99676.34 hectares with 44.89 percent of total area. It has increased up to 18724.34 hectares with 23.13 percent of the total area during 1986-87 to 2012-13.

| Table - 5 | | | | | | |
|--|----------------|--------|-------------|-----------|-------------|-----------|
| Block wise Distribution Patterns in Net Sown Area in Siwan District, 1986-87 & 2012-13 | | | | | | |
| (Area in Hectares) | | | | | | |
| Sl. No. | Blocks | | 1986-87 NSA | % of T.A. | 2012-13 NSA | % of T.A. |
| 1 | Siwan | 12148 | 9964 | 4.49 | 9955.12 | 4.48 |
| 2 | Pachrukhi | 15017 | 12710 | 5.72 | 10060.96 | 4.53 |
| 3 | Daraundha | 14894 | 12797 | 5.76 | 9817.46 | 4.42 |
| 4 | Maharajganj | 11606 | 8860 | 4.00 | 8523.56 | 3.84 |
| 5 | Basantpur | 6220 | 12953 | 5.83 | 5207.10 | 2.35 |
| 6 | Goriakothi | 13676 | 11452 | 5.15 | 9895.48 | 4.46 |
| 7 | Bhagwanpur | 14828 | 12156 | 5.47 | 11141.06 | 5.02 |
| 8 | Barharia | 17732 | 14606 | 6.58 | 13945.20 | 6.28 |
| 9 | Hussainganj | 9540 | 11366 | 5.12 | 7194.03 | 3.24 |
| 10 | Andar | 7195 | 11212 | 5.05 | 8369.06 | 3.76 |
| 11 | Siswan | 12799 | 7452 | 3.35 | 8266.32 | 3.72 |
| 12 | Raghunathpur | 19120 | 12051 | 5.43 | 11652.90 | 5.25 |
| 13 | Mairwa | 6813 | 15160 | 6.83 | 5548.34 | 2.50 |
| 14 | Guthani | 9169 | 7768 | 3.50 | 6992.19 | 3.15 |
| 15 | Darauli | 16571 | 12725 | 5.73 | 10284.58 | 4.63 |
| 16 | Nautan | 12000 | - | - | 4334.41 | 1.95 |
| 17 | Lakri Nabiganj | 9795 | - | - | 6124.66 | 2.76 |
| 18 | Hasanpura | 5000 | - | - | 7528.23 | 3.39 |
| 19 | Ziradei | 7908 | - | - | 9162.92 | 4.13 |
| District Total | | 222051 | 173232 | 78.01 | 164003.58 | 73.86 |
| Source: Unpublished Data of D.A.O., 2013, by Research Scholar. Denotes not available. | | | | | | |

| Table -6 | | | | | | |
|--|----------------|------------------|--------------------------|-----------|--------------------------|-----------|
| Block wise Distribution of Area Sown More Than Once in Siwan District, 1986-87 & 2012-13 | | | | | | |
| (Area in Hectares) | | | | | | |
| Sl. No. | Blocks | Area in Hectares | 1986-87 | | 2012-13 | |
| | | | Area sown more than once | % of T.A. | Area sown more than once | % of T.A. |
| 1 | Siwan | 12148 | 4345 | 1.96 | 943.95 | 0.43 |
| 2 | Pachrukhi | 15017 | 12888 | 5.80 | 2285.67 | 1.03 |
| 3 | Daraundha | 14894 | 4308 | 1.94 | 1582.99 | 0.72 |
| 4 | Maharajganj | 11606 | 4580 | 2.06 | 2851.11 | 1.28 |
| 5 | Basantpur | 6220 | 6319 | 2.85 | 13158.12 | 5.93 |
| 6 | Goriakothi | 13676 | 4477 | 2.01 | 13554.58 | 6.10 |
| 7 | Bhagwanpur | 14828 | 5937 | 2.67 | 1076.76 | 0.48 |
| 8 | Barharia | 17732 | 7461 | 3.36 | 925.60 | 0.42 |
| 9 | Hussainganj | 9540 | 5722 | 2.58 | 4019.23 | 1.81 |
| 10 | Andar | 7195 | 4349 | 1.96 | 2804.93 | 1.26 |
| 11 | Siswan | 12799 | 5510 | 2.48 | 7122.88 | 3.21 |
| 12 | Raghunathpur | 19120 | 3552 | 1.60 | 7625.96 | 3.43 |
| 13 | Mairwa | 6813 | 3801 | 1.71 | 12884.53 | 5.80 |
| 14 | Guthani | 9169 | 4565 | 2.06 | 6452.76 | 2.91 |
| 15 | Darauli | 16571 | 3138 | 1.41 | 2148.94 | 0.97 |
| 16 | Hasanpura | 5000 | - | - | 6524.54 | 2.94 |
| 17 | Nautan | 12000 | - | - | 9614.63 | 4.33 |
| 18 | Lakri Nabiganj | 9795 | - | - | 2319.31 | 1.04 |
| 19 | Ziradei | 7908 | - | - | 1775.85 | 0.80 |
| District Total | | 222051 | 80952 | 36.45 | 99676.34 | 44.89 |
| Source: Unpublished Data of D.A.O., 2013, by Research Scholar. Denotes not available. | | | | | | |

In 1986-87, Pachrukhi block had maximum area under this land with 12888 hectares, 5.80 percent of the total area, while in 2012-13, Goriakothi has maximum area under this category with 13554.54 hectares (6.10 percent). Nine blocks viz; Siwan, Pachrukhi, Daraundha, Maharajganj, Bhagwanpur Hat, Barharia, Hussainganj, Andar, Darauli blocks have decreased in areas from 1986 to 2013 in study area. Alongwith Basantpur, Goriakothi, Siswan, Raghunathpur, Mairwa, Guthani have increased in the areas during the same years. Land under area sown more than once varies during the investigation periods. It was 80952 hectares (36.45 percent) in 1986-87 and reached up to 99676.34 hectares (44.89 percent) of the total geographical area in 2012-13. The positive changes have occurred with 23.13 percent of the total area under study.

Summary and Conclusion

The conclusion that may be derived from the foregoing analysis is observed that the level of land use pattern in Siwan district is not uniform in all the blocks of the district. Marginal changes have been found in most of the blocks of the study area. No changes have been witnessed in some block as Raghunathpur, Pachrukhi, Goriakothi, Bhagwanpur, Daraundha, Barharia, Siwan blocks in barren and uncultivated land, cultivated waste land, permanent pasture and other grazing land. The proportion of net sown area has decreased from 78.01% during 1986 to 2013. Barren and uncultivated land have also decreased about 2056 hectares (0.93%), cultivated waste land has decreased by 0.02% during 1986-87 to 2012-13. Such type of decreasing trends of land use is exhibited due to urbanization, pressure of population and development activities etc. Keeping these views, the proportion of area under non agricultural land use pursuit has increased during under study. The meagre agricultural land replaced into other land use categories. It indicates the land use management. The trends of management of land use pattern have changed due to economic development, pressure of population and availability of foodgrains and other basic need of human beings and animals.

To sum up it is essential to assess the land use data to improve the management of land use and development of land.

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