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Spatial Variation of Agricultural Landuse in Ahmednagar District 1960-61 and 2010-11**Prof. Manohar Ramnath Erande**Assistant Professor,
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Latur, India.**Abstract:**

The Net Area Sown, Land Not Available for Cultivation, Cultivable Waste, Fallow Land and Forest Cover are included in agricultural land use. Use of land is an important factor for planning process because of the predetermined nature of land resource. In Ahmednagar district net sown area steadily decreased by 5.84 percent since 1960-61 to 2010-2011. The trend of cultivable waste increased 0.55 percent from 1960-61 to 2010-11. In the Ahmednagar District, the land not available for cultivation was 9.11 percent (1960-61) to the total geographical area; it increased 0.99 percentages (10.10%) in 2010-11. The highest area under fallow land has increased to 11.88 percent to total geographical area followed by land not available for cultivation 10.10 percent to total geographical area in the district. The cultivation of crops in Ahmednagar District is confined to kharif and rabbi seasons.

Keywords: Agricultural Landuse, Net Area Sown, Land Not Available for Cultivation, Cultivable Waste, Fallow Land, Forest.

Introduction:

The fundamental utility of land is fulfilling the human needs of food habitation and housing materials. It is essential to choose proper mode of agricultural landuse planning and allocation to various ingredients of optimum landuse to solve the human needs (Kellong, 1980) has rightly pointed out that this calls for the clear understanding of land classification for successful planning and development. The application of various inputs in land may change the allocation of land to different uses. The factors, conservation and quality of our socio economic environments are most elemental for the proper use of our land in each crop. This statement is true not only of percent Jawar is large urban centre as well as most of the remote areas. In order to deal with these and to plan for optimum utilization of land, it is necessary to have accurate and up to date information in all possible details on crops. It is therefore, the study of classification of under crop area in agricultural landuse pattern in Ahmednagar District would be helpful for preparation of the completed need of food and development plan for the district.

Data Source and Methodology:

The area of covered each landuse factor had converted into percentage to total geographical area. Secondary data has been used from Socio-Economic Reviews and District Statistical Abstracts of Ahmednagar District in 1960-61 and 2010-11. The description of each land classification has been supplemented by numerous spot-inquires, besides information embodied by using the Ahmednagar District Census Handbook, District Gazetteer and District Socio Economic Review of Ahmednagar District.

Objectives:

1. To highlight the tahsilwise agricultural land use in Ahmednagar district in 1960-61 and 2010-11.
2. To analysis the spatial distribution of each landuse factor.

Study Area:

Ahmednagar district is situated partly in the upper Godavari Basin. It lies between 18°2' North latitude to 19° 9' North latitude and 73°9' East longitudes to 75° 5' East longitudes. It is surrounded by Nashik district in the North, Beed and Aurangabad districts in the East, Pune district in the South, Thane and Raigad district in the North-West. Ahmednagar district has an area of 17410 square km and a population is 4543159 (2011 Census). It ranks first in terms of area and sixth in terms of population amongst the district of the state. The main stream of hills in the Sahyadri which is runs north-south in the western proportion of the district. It acts as a watershed between the Pravara and its tributaries which drain towards the Godavari. The climate of the district is generally dry except during the South-West monsoon season. The average annual rainfall for the district as a whole is 488.4 mm. Within the district there are considerable variations in rainfall. The rainfall in generally decrease as one proceeds from West to East. Temperature begins to increase rapidly from the latter half of February. May is the hottest month and December is the coldest month with the Maximum temperature at 36.38°C and minimum temperature at 19.92°C at Ahmednagar. The soil of the district is essentially derived from the Deccan Trap which is the predominant rock formation of the district

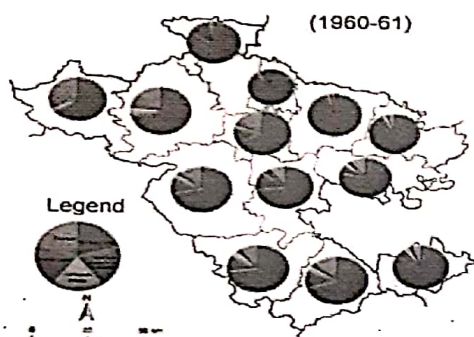
Spatial Analysis of Agricultural Landuse:

The spatial pattern in landuse in Ahmednagar District is the result of interaction between physical environment and socio-economic environment. But the impact of regional and local factors is clearly evident from the landuse patterns. Besides these factors, amount of rainfall exerts profound influence on the types of landuse in the Ahmednagar District. These subtypes are as follows:

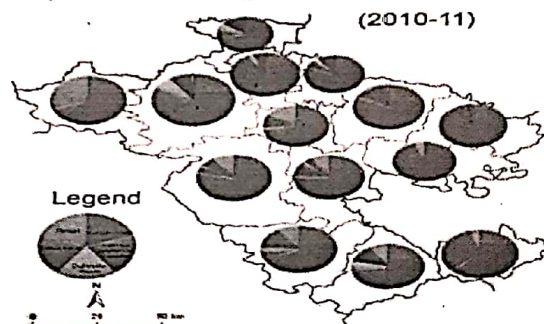
1. Net Area Sown (NSA)
 - a. Land put to non-agricultural uses
2. Cultivable Waste (CW):
 - a. Permanent pastures and other grazing land
 - b. Land under miscellaneous tree crops and groves not included in net sown area
3. Fallow Land (FL):
 - a. Current fallow land
 - b. Fallow land other than current fallow
4. Forest/Forest Cover (F)

The above mentioned categories have been used to examine the spatial pattern of landuse in Ahmednagar District. The percentage of each landuse type has been calculated to total geographical area of the district. The percentage area of landuse type has given in Table 1 and 2.

Map 1: Ahmednagar- General Landuse



Map 2: Ahmednagar- General Landuse



1. Net Sown Area:

The net sown area includes land actually under food crops, cash and fodder crops. The Ahmednagar District has 68.11 percent land under cultivation to total geographical area showing relatively greater than Maharashtra (56.52%) in 2010-11. This peculiarity of the land pattern of the district can be accounted by the presence of Sahyadrian Mountain range and its off shoots spread within the district.

Table 1 and Map 1 reveal the spatial variations in the percentage of net sown area to total geographical area in the Ahmednagar District (1960-61). It is observed from this map that net sown area was maximum (more than 70 percent) in Kopergaon (83.50%) followed by Shrirampur (82.24%), Newasa (88.39%), Shevgaon (87.30%), Pathardi (78.57%), Nagar (73.05%), Parner (71.57%), Shrigonda (73.46%) and Jamkhed (84.47%) while it was minimum (less than 60 percent) in Akole (57.91%). This is the outstanding trend of net sown area. This can be explained by the fact that the western part (Akole and Sangamner) of the district occupied by Sahyadrian mountain range that is almost forest land, unsuitable and low fertility soil. As a result, comparatively less percentage of area has been brought under cultivation. Remaining part of the district (Pravara, Mula, Sina river basins) is low-lying plain with medium to deep black soil, suitable for extensive land under plough.

Table 1: Ahmednagar District: General Landuse (1960-61) (Area in Percentage)

Sr. No.	Tahsil	LANDUSE TYPES				
		NSA	LNAC	CW	FL	F
1	Akole	57.91	6.12	3.32	3.26	29.39
2	Sangamner	61.08	10.87	4.63	2.20	21.21
3	Kopergaon	83.50	10.07	0.19	3.54	2.70
4	Rahata	---	---	---	---	---
5	Shrirampur	82.24	6.93	1.82	7.54	1.46
6	Newasa	88.39	6.42	1.86	1.47	1.86
7	Shevgaon	87.30	4.23	3.13	1.10	4.23
8	Pathardi	78.57	7.26	2.50	1.83	9.84
9	Nagar	73.05	12.38	0.73	4.99	8.85
10	Rahuri	67.55	11.70	0.98	2.56	17.21
11	Parner	71.57	10.92	2.36	1.61	13.54
12	Shrigonda	73.46	10.16	4.30	2.43	9.66
13	Karjat	69.82	11.94	2.95	2.55	12.74
14	Jamkhed	84.47	5.02	3.20	2.17	5.14
	Total	73.95	9.11	2.58	2.74	11.63

Source: Socio-Economic Abstract- Ahmednagar District.

Table 2 and Map 2 clearly show that in 2010-11, there was great change or decrease in the percentage of net sown area to total geographical area. In 2010-11, maximum percentage (more than 70 percent) of land under net sown area is found at Kopergaon (73.93%), Shirampur (81.44%), Newasa (83.55%), Shevgaon (89.23%), Nagar (75.86%) and Parner (78.29%).

During the year 2010-11 the category consisting 60 to 70 percent net sown area to the total geographical area is shown in Map 2 and Table 2. Only three tahsils comes under this category i.e. Akole (60.79%), Sangamner (61.30%), Shrigonda (69.04%) and Jamkhed (60.04%) and 50 to 60 percent net sown area observed in Rahuri (59.13%) and Karjat (50.72%) tahsils. Below 50 percent net sown area observed in Pathardi (38.83%) tahsil.

Table 2: Ahmednagar District: General Landuse (2010-11) (Area in Percentage)

Sr. No.	Tahsil	LANDUSE TYPES				
		NSA	LNAC	CW	FL	F
1	Akole	60.79	8.74	0.39	2.35	27.72
2	Sangamner	61.30	21.65	7.18	9.04	0.84
3	Kopergaon	72.93	6.90	5.70	14.48	0.00
4	Rahata	84.98	6.95	1.82	6.25	0.00
5	Shrirampur	81.44	5.93	2.66	9.97	1.13
6	Newasa	83.55	12.26	0.09	2.97	1.06
7	Shevgaon	89.23	7.93	0.28	49.88	5.46
8	Pathardi	38.83	5.00	0.83	3.78	8.76
9	Nagar	75.86	10.42	1.17	11.21	15.45
10	Rahuri	59.13	13.14	1.08	5.84	10.06
11	Parner	78.29	5.38	0.43	14.77	9.48
12	Shrigonda	69.04	5.19	1.52	12.62	8.76
13	Karjat	50.72	22.16	5.73	31.95	4.31
14	Jamkhed	60.04	2.74	0.95	11.88	7.89
Total		68.11	10.10	2.03		

Source: Socio-Economic Abstract- Ahmednagar District.

Table 3 shows the percentage variation in general landuse between the study periods. The percentage of net sown area increased in Akole, Sangamner, Shevgaon, Nagar and Parner tahsils while in remaining tahsils the percentage of net sown area goes on decreased. This significant decreased in net sown area may be due to more land under roads, residuals subsequently under land put to non agricultural use, cultivable waste and fallow land. There was decreased in the percentage of net sown area (-5.84%), cultivable waste (-0.55%) and forest (-3.74 %) while the percentage increased in land not available for cultivation (0.99%) and fallow land (9.14%) in Ahmednagar District.

Table 3: Percentage Variation in General Landuse(Between 1960-61 to 2010-11)

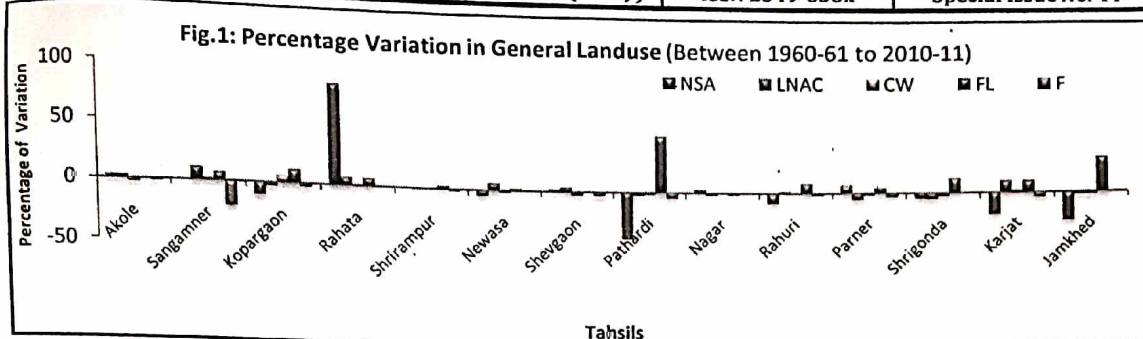
Sr. No.	Tahsil	LANDUSE TYPES				
		NSA	LNAC	CW	FL	F
1	Akole	2.88	2.62	-2.93	-0.91	-1.67
2	Sangamner	0.22	10.78	2.55	6.84	-20.37
3	Kopergaon	-10.57	-3.17	5.51	10.94	-2.7
4	Rahata	84.98	6.95	1.82	6.25	0
5	Shrirampur	-0.8	-1	0.84	2.43	-1.46
6	Newasa	-4.84	5.84	-1.77	1.5	-0.73
7	Shevgaon	1.93	3.7	-2.85	0.4	-3.17
8	Pathardi	-39.74	-2.26	-1.67	48.05	-4.38
9	Nagar	2.81	-1.96	0.44	-1.21	-0.09
10	Rahuri	-8.42	1.44	0.1	8.65	-1.76
11	Parner	6.72	-5.54	-1.93	4.23	-3.48
12	Shrigonda	-4.42	-4.97	-2.78	12.34	-0.18
13	Karjat	-19.1	10.22	2.78	10.07	-3.98
14	Jamkhed	-24.43	-2.28	-2.25	29.78	-0.83
Total		-5.84	0.99	-0.55	9.14	-3.74

Source: Compiled by the Researcher.

2. Land Not Available for Cultivation (LNAC):

This is divided into following types;

- Land-put to non-agricultural uses: Land occupied by settlements, roads, railways, streams, canals and rivers are included in this type.
- Barren and uncultivable land: Outcrops of hills and mountains are included in this type. The small part of this land can be brought under cultivation of very high costs. Generally, barren and uncultivated land is associated with poor soils, heavy rainfall and intense erosion:



In 1960-61 more than 10 percent land not available for cultivation was observed in Sangamner, Kopargaon, Nagar, Rahuri, Parner, Shrigonda and Karjat tahsils; while remaining tahsils observed less than 10 percent land not available for cultivation (Table 1 and Map 1). As well as in 2010-11, there is significance change in land not available for cultivation. Table 2 and Map 2 shows that three tahsils falls in the range of 10 to 15 percent viz. Newasa (12.26%), Nagar (10.12%) and Rahuri (13.14%) and two tahsils increased to more than 20 percent viz. Sangamner (21.65%) and Karjat (22.16%) of land not available for cultivation in the study area. While in remaining tahsils have less than 10 percent land not available for cultivation.

In the Ahmednagar District, the land not available for cultivation shows considerable variations within the district (Table 3). The land not available for cultivation (10.10%) was less to the Maharashtra (10.33%). The percentage of land not available for cultivation was highly increased in Sangamner (10.78%) followed by Karjat (10.22%), Newasa (5.84%) and Rahata (6.95%), while it was highly decreased in Parner (-5.54%), Shrigonda (-4.97%), Kopargaon (-3.17%), Jamkhed (-2.28%), Pathardi (-2.26%) and Nagar (-1.96%) tahsils between the study period (Table 3 and Fig. 1).

3. Cultivable Waste (CW):

The cultivable waste land includes other uncultivated lands excluding fallow land. This category is divided into three types.

- Permanent pastures and other grazing lands,
- Miscellaneous tree crops and groves and
- Cultivable waste.

The permanent pastures and grazing lands include all land, are under grass-cover, government and private land; or permanent pastures which are kept reserved as a village common grazing ground or vast tract of protected land, not open for free grazing and unreserved grassland. The miscellaneous tree crops and groves include land under grasses, bamboo, bushes and other groves for fuels etc. which not included under orchards or forests are included in this category and the land not cultivated during the preceding five years is called cultivable waste.

The Ahmednagar District had 2.58 percent (1960-61) and 2.03 percent (2010-11) to total land under cultivable waste (Table 1 and 2). It was slightly decreased (-0.55%) between the study period and 5.82 percent less as compared to Maharashtra. The cultivable waste was observed in varied ranges within the district. In 1960-61, all tahsils come under less than 5 percent cultivable waste land. While in 2010-11, Sangamner, Kopargaon and Karjat observed more than 5 percent of cultivable waste land as well as Akole, Rahata, Shrirampur, Newasa, Shevgaon, Pathardi, Nagar, Rahuri, Shrigonda and Jamkhed tahsils observed less than 5 percent cultivable waste land.

Table 3 clearly shows that there was significant variation in cultivable waste between the study periods. There was high percentage of cultivable waste land increased at Kopargaon tahsil (5.51%) followed by Karjat (2.78%), Sangamner (2.55%), Rahata (1.82%) and Shrirampur (0.84%) while the percentage of cultivable waste land highly goes on decreased at Akole (-2.93%) followed by Shevgaon (-2.85%), Shrigonda (-2.78%), Jamkhed (-2.55%) and Parner (-1.93%) tahsils.

4. Fallow Land (FL):

The fallow land is generally, divided into two categories;

- Current fallow land and
- Other than current fallow land.

The current fallow land includes the land which is not cultivated during the current year due to variety of regions i.e. as phase to rotation, for regaining fertility or due to some other constrains. Other than current fallow land includes arable area which is taken up for cultivation but has gone temporarily out of cultivation for a period of not more than five years.

The Ahmednagar District had 2.74 percent (1960-61) and 11.88 percent (2010-11) to total area under fallow land (Table 1 and 2). It was increased (9.14%) between the study period and 3.52 percent more as

compared to Maharashtra (2010-11). The fallow land was observed in varied ranges within the district. In 1960-61, Akole, Kopergaon, Shrirampur and Nagar observed more than 3 percent fallow land in 1960-61, while remaining tahsils observed less than 3 percent of fallow land to the total geographical area. As well as in 2010-11, high percentage of fallow land observed at Pathardi (49.88%), Jamkhed (31.95%), Shrigonda (14.77%), Kopergaon (14.48%), Karjat (12.62%) and Rahuri (11.21%). While Shrirampur (9.97%), Sangamner (9.04%), Rahata (6.25%), Parner (5.84%), Nagar (3.78%), Newasa (2.97%), Akole (2.35%) and Shevgaon (1.50%) tahsils observed low percentage (less than 10 %) of fallow land in the district.

Table 3 clearly shows that there was great variation in fallow land between the study periods. There was high percentage of fallow land increased at Pathardi tahsil (48.05%) followed by Jamkhed (29.78%), Shrigonda (12.34%), Kopergaon (10.94%) and Karjat (10.07%), while the percentage of fallow land decreased at Nagar (-1.21%) and Akole (-0.91%) tahsils only.

5. Forest Land (F):

In assessing the character of the vegetation type, a factor that can not be neglected in the long occupation of man and the consequent change on the vegetal carpet through agriculture. The type of vegetation met with any given locality depends on the climate, soil and past treatment has been emphasized by the leading plant ecologists.

The Ahmednagar District had 11.63 percent (1960-61) and 7.89 percent (2010-11) of total area under forest land (Table 1 and 2). It was decreased (-3.74%) between the study period and 9.05 percent more as compared to Maharashtra (2010-11). The forest land was observed almost in stable range within the district. One comes across the maximum forest land at Akole (29.39%) followed by Sangamner (21.21%) Rahuri (17.21%) and Parner (13.54%) in 1960-61 and Akole (27.72%), Rahuri (15.45%) and Parner (10.06%) in 2010-11, while the minimum at Shrirampur (1.46%) in 1960-61 and 2010-11 in the study period.

Table 3 clearly shows that there was significant variation in forest land. There was high percentage of forest land highly goes on decreased at Sangamner (-20.37%), Pathardi (-4.38%), Karjat (-3.98%), Jamkhed (-3.74%), Parner (-3.48%) and Shevgaon (-3.17%). There was not more decreased in forest land in the district. But the density of trees goes on decreased day by day.

Summary and Conclusion:

1. The net sown area was observed maximum in Kopergaon and minimum in Akole Taluka.
2. In the district the percentage of net sown area decreased (5.84%) in the study period. Net sown area increased in Akole (2.88%), Nagar (2.81%) and Parner (6.72%) while the remaining part of the district the percentage of net sown area observed on decreased.
3. The land not available for cultivation in district observed (10.10%) was less to the Maharashtra (10.33%).
4. The percentage of land not available for cultivation was highly increased in Sangamner (10.78%) and highly decreased in Parner (-5.54%) taluka.
5. The maximum cultivable waste observed at Sangamner 4.63% in 1960-61 and 7.18% in 2010-11 and the minimum at Kopergaon 0.19% in 1960-61 and Newasa 0.09% in 2010-11 in the study period.
6. The high percentage of cultivable waste land increased in Kopergaon taluka and decreased in Akole taluka.
7. The maximum fallow land observed at Shrirampur (7.54% in 1960-61) and Pathardi (49.88% in 2010-11) while the minimum at Shevgaon in 1960-61 and 2010-11 respectively 1.10% and 1.50% in the study period.
8. The high percentage of forest land increased in Pathardi taluka and decreased in Nagar taluka.
9. Ahmednagar District has 11.63 percent and 10.91 percent of land under forest cover during 1960-61 and 1970-71 respectively. From 1990-91 to 2010-11 land under forest decreased by 3.14 percent.

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