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Spatial Distribution of Landuse Planning in Kurnool District Andhra Pradesh

KEYWORDS: Forest, Net area sown area, cultivable land and built-up land etc.,

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ABSTRACT *Landuse and land cover studies are of great important when the resource base of any region are under examination. Optimum use, conservation and scientific management of land resource play a crucial role in developing the agricultural economy of any region. In the regional economy the need of landuse studies and planning is much more importance. Landuse study forms the " spearhead of the advance of geography into the applied science as maps of landuse become recognized as essential tools of regional planning and development" Symons. Spatial pattern of land use may influence many natural phenomena and ecological process including run off, soil erosion and also soil condition. The name Kurnool is said to have been derived from "Kandanavolu". Kunool district lies in between the of 14° - 54' and 16°-18' N latitude and 76°-58' and 78°-25' E longitudes. The district is bounded on the north by Tungabadra and Krishna rivers as well as Mahaboob nager district, on the south by Kadapa and Anan-rapur districts on the west by Karnataka state and on the east by Prakasam district. The objective of the study spatial pattern of land, The method of use in calculated the percentage of landuse.*

INTRODUCTION

Simple landuse system of Stamp, has introduced structure for describing landuse has developed. The Canada land Use Inventory, although based partly on investigations of present land use, is primarily executed as an evaluation of land use capabilities.

The landuse pattern is more complex and dynamic in nature and regional. "The complex landuse pattern in an area manifests the outcome of trial and errors of many thousand years of settlement. The present pattern of landuse in India is the result of long continued operation of the whole range of environmental factors but modified by socio-economic and historical elements" (Shafi,1966, p.16).

The present study area wise problems are existing in landuse studies. The main problems of landuse include under-utilization, over-utilization and mis-utilization. The land is available for agricultural, industrial and building purposes and others is limited as days are passing. The population explosion causing for decreasing man-land ratio occupational shifting for existing challenging problems to the landuse planners, farmers, administrators and particular for agricultural geographers.

Objectives of the study area

- To access the spatial distribution of landuse in the year 2010-2011.
- To examine the findings and suggestion for the land use of the study area.

Methodology and data collection

The present research work has been carried by collecting secondary data. The secondary data had calculated for the spatial distribution of landuse at mandal level. The data has been collected from the Hand book of Statistics, Chief Planning Office, Kurnool in the year, 2010-2011.

Study area

The district is bounded on the north by Tungabhadra and Krishna rivers as well as Mahaboob Nagar district of Telangana, on the south by Kadapa and Anantapur districts and on the west by Karnataka state and on the east by Prakasam district. Kurnool district lies in between 14° - 54' and 16°-18' N latitudes and 76°-58' and 78°-25' E longitudes. The area of the district is 17,658 km^2.

Kurnool district lies in the Rayalseema region of AP. Kurnool district is generally drought prone. The average rainfall is 670mm. Black cotton soil is there is east and north west parts where as red soil is there in south east. The district experiences hot summer and dry and cold winters.

The district ranks 8th position in population (4,046,601 people) accounting for 4.78 per cent of the total population of the state as per 2011 population census, while in area it accounted for 6.41 per cent of the total area of the state.

Physiographically the district consists of two important hilly ranges namely Nallamalas and Erramalas running parllel from north to south. The Nallamalas are located on the eastern part of the district and the Erramalas are found in central part of the district.

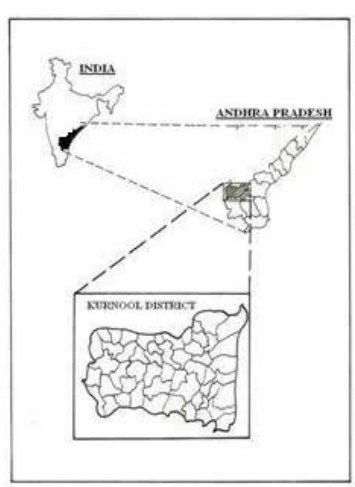

Fig-1

Land utilization maps of Cyprus (1:2,500,000) have been prepared under the direction of R. R. Rawason and K. R.

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Sealy in the Department of Geography, London School of Economics in 1956. The maps were prepared from about 10,000 air photographs (1:10,000 to 1:13,000) taken in 1949 (Melamid, 1958).

"Indian geographers have long been attracted to study the problem of land use in the country with a view in finding out ways and means for scientific utilization of land resources. Such studies range from inventories of landuse surveys to isolated topical or regional descriptive on account of landuse variations both in space and time. Recently the studies are shifting towards the application of quantitative techniques in the analysis of various landuse components" (Shafi, 1972, p.19). Based on the uniform Indian classification the total land area geographically accessible for major uses classified in to nine broad categories, namely.

1.Forest area, 2. Area under non-agricultural use, 3. Barren lands, 4. Permanent pastures and other grazing lands, 5. Area under miscellaneous tree crops, 6.Culturable waste land, 7. Current fallows lands, 8. Other fallow lands and 9. Net sown area.

The above landuse classifications have been accepted all the states leading to comparability in landuse pattern, (Jasbir Sing, 1974, p.105). In the present study these nine landuse types are grouped in to five major landuse categories for the purpose of examining the spatial pattern of land use in Kurnool district. The five major land categories are as follows.

1. Forest landuse
2. Land under non-agricultural use
3. Cultivable waste landuse
4. Fallow landuse
5. Net sown area

The present study, spatial distribution of landuse has been forest area is observed in (19.29%) of the total geographical area. Non agricultural land use (15.21%) of the total geographical area. It is including in water logged, Social forestry, settlements, land under still water and other lands. Cultivable waste landuse is the (3.01%) of the total geographical area. Fallow landuse is (12.12%) of the total geographical area is observed. Net sown area is observed in (50.37%) of the total geographical area (shown the fig-2).

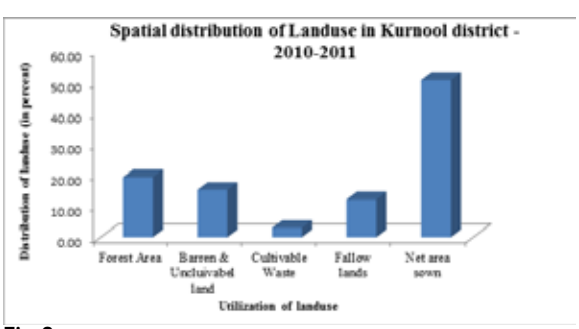

Fig-2

Forest land use

During 2010-2011 forest land cover is 3,40,669 hectares and accounted for (19.29%) of the total geographical area. The distribution of the forest area is found very high(more than 40%), in 8 mandal, low(10-20) in 7 mandals, and Very low(below10) in 38 mandals. The 8 mandals which possess Very high distribution of forest are Srisailam(95.75%), Mahanandi (62.53%), Velgodu (56.77%), Bandi Atmakur (53.06%), Rudravaram(49.75%), Allgadda(48.42%), Atmakur(47.59%) and Kottapalli(4.30%) base have very high spatial distribution of forest cover, while one mandal Chagalamarri has high(30-40%) spatial distribution with (35.21%) forest cover area, Moderate(20-30%) forest cover is found in zero, Low distribution of forest cover in 7 mandals namely Betamcherla with (8.7%), Krishnagiri with (7.5%), Pathikonda with (6.82%), Adoni with (6.42%), Peapuly with (6.28%), Tuggali with (6.03%), Kallur with (5.85%), Kurnool with (5.45%) and Devenakonda mandal with (5.37 %) is occupied forest cover. While the remaining 38 mandals have very low forest cover. In this connection it may be noted that the spatial distribution high in the hilly ranges of Nallamala and Erramala located in above said mandals. The spatial distribution shows that the forest area is concentrated in the eastern mandals covering hills.

Non-Agricultural land use

The land not suitable for agricultural production may be described as non - agricultural land. These types of land cover include 2 type of lands namely, Barren land and un-cultivable land is include in (Water Logged, Social Forest, Land under still water and other lands). Barren and un-cultivable land are not suitable for cultivation due to their rocky, out crops, desert, stone quarries, bad lands etc., The land under non-agricultural includes residential area, transportation facilities, embarkment, water bodies, marshy area, industrial estate, recreation places etc., In the Kurnool district the total non Agricultural land use is 2,68,506 lakh hectare and account for (15.21%) respectively in the year 2010-2011.

with (23.01%), Sanjamala with (22.27%), Devanakonda with (21.56%), Nandyal with (21.34%), Kallur with (20.98%). While 17 mandals which possess low(below 10%) spatial distribution of non agricultural land and 21 mandals which possess very low are under non agricultural land use.

Table-1: Mandal wise Spatial distribution pattern of landuse Kurnool district - 2010-11 (in percent)

S. No.	Name of the Mandal	Forest Area	Non-Agricultural landuse	Cultivable Waste	Fallow lands	Net sown area
1	Mantralayam	1.92	15.66	2.41	23.11	56.90
2	Kosigi	1.31	16.85	2.73	21.72	57.39
3	Kowtalam	1.14	7.50	1.44	24.54	65.39
4	Peddakadubur	1.50	17.33	1.54	6.43	73.20
5	Yamiganur	3.36	14.46	2.74	9.39	70.05
6	Nandavaram	0.00	10.83	0.93	14.19	74.06

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7	C.Belagal	0.00	23.01	7.50	5.69	63.80
8	Gudur	0.00	14.54	2.92	9.69	72.85
9	Kallur	5.85	20.98	0.24	14.21	58.71
10	Kurnool	5.45	24.21	1.63	9.13	59.58
11	Nadikotkur	1.99	18.01	4.38	23.02	52.61
12	Pagidyala	0.00	56.16	0.49	11.37	31.98
13	Jupadubanglow	0.00	26.14	7.00	11.18	55.68
14	Kottapalli	40.30	29.44	0.37	6.23	23.66
15	Srisailam	95.75	4.25	0.00	0.00	0.00
16	Atmakur	47.59	8.28	6.21	6.70	31.23
17	Pamulapadu	2.87	27.35	4.16	9.19	56.42
18	Midthur	2.76	5.25	0.14	29.99	61.87
19	Orvakal	3.88	28.63	3.72	14.41	49.36
20	Kodumur	0.00	18.56	2.18	19.38	59.89
21	Gonegandla	0.00	17.30	5.87	10.22	66.61
22	Adoni	6.42	14.16	0.95	21.21	57.26
23	Holagunda	10.93	12.50	7.44	29.02	40.10
24	Halaharvi	2.14	3.18	1.51	44.78	48.39
25	Alur	1.84	9.86	1.28	6.44	80.58
26	Aspari	1.80	9.35	0.16	41.38	47.31
27	Devanakona	5.37	21.56	7.19	4.71	61.16
28	Krishnagiri	7.15	9.45	20.66	1.13	61.61
29	Veldurthi	14.75	16.99	3.46	15.36	49.44
30	Bethamcherla	8.07	29.19	2.95	13.02	46.77
31	Panyam	13.60	25.77	1.58	8.30	50.75
32	Gadivemula	12.63	16.95	6.43	8.97	55.02
33	Velgodu	56.77	5.55	2.38	10.53	24.78
34	Bandi Atmakur	53.06	6.25	4.93	3.65	32.12
35	Nandyal	0.00	21.34	3.81	2.40	72.45
36	Mahanandi	62.53	4.72	2.60	0.91	29.25
37	Sirvel	0.01	8.82	2.56	5.63	82.98
38	Gospadu	0.00	8.49	1.24	0.27	90.00
39	Banaganapalle	16.31	13.64	4.47	20.62	44.96
40	Dhone	10.01	19.30	0.13	9.59	60.98
41	Pathikonda	6.82	7.78	1.74	11.18	72.47
42	Chippagiri	0.00	4.29	0.43	16.00	79.28
43	Maddikera	0.00	8.15	0.70	10.84	80.31
44	Tuggali	6.03	11.73	7.20	1.80	73.24
45	Peapully	6.28	25.79	0.59	7.96	59.39
46	Owk	16.08	43.23	2.60	9.84	28.26
47	Koilkuntla	0.00	8.14	7.08	2.72	82.07
48	Rudravaram	49.75	7.20	0.71	14.59	27.76
49	Allagadda	48.42	9.06	1.48	5.91	35.13
50	Dornipadu	0.00	5.33	1.83	4.75	88.09
51	Sanjamala	0.00	22.27	3.65	2.82	71.26
52	Kolimigundla	0.00	29.38	2.91	40.03	27.68
53	Uyyalawada	0.00	7.23	1.95	6.07	84.76
54	Chagalammari	35.21	11.93	0.20	7.73	44.93
Total		19.29	15.21	3.01	12.12	50.37

Source: Chief Planning office, Kurnool

The non-agricultural land distribution has high(Above 30%) in two mandal namely Pagidyala (56.16%) and Owk mandal (43.23%), Moderate(20-30%) account for the non agriculture land is found in 14 mandals namely (Kottapalli with 29.44%), Kolimigundla with (29.38%), Bethamcherla with (23.19%), Orvakal with (28.63%), Peapully with (25.79%), Panyam with (25.77%), Kurnool with (24.21%), C.Belagal The spatial pattern of non-agricultural landuse analysis shows that, the high spatial distribution of non-agriculture land use is concentrated in north-central and south-central part of the district, moderate concentration is found in north-central, south-central parts, while low and very low concentration is found in south-western and central-eastern part of the district.

Cultivable waste land use

The cultivable waste land un-cultivable land. Very high(above 8%) distributed in one mandal. The mandal with possess high distribution is Krishnagiri with (20.66%). High (6-8%) spatial concentration is observed in 8 mandals, moderate(4-6%) in 5 mandals, low (2-4%) in 16 mandals and very low(below 2%) in 24 mandals. Very high and high concentration of cultivable waste land is found in west-eastern side, moderate concentration found in the eastern side of the district. So the distribution of this category of land use is un-even and indicating that, there is no major particular concentrated area of this category of land cover.

Fallow land

The spatial distribution of fallow land has high(above 30%) in 3 mandals, moderate(20-30%) 22 mandals, low(below 10%) in 29 mandals. The 3 mandals which possess high distribution of fallow land are Halaharvi(44.78%), Aspari(41.38%), Kolimigundla (40.03%). The 22 mandals which possess of follow land are Midthur, Holagunda, Kowtalam, Mantralayam, Nadikotkur, Kosigi, Adoni, Bana ganapalle,Kodumur,Chippagiri and Veldurthi etc., The low in 29 mandals namely,Owk,Gudur,Dhone,Yamiganu,Pamu lapadu,Kurnool,Gadivemula,Panyam,Peapully, Chagalam

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mari,Atmakur,Alur,Peddakadubur and Kottapalli etc.,The spatial distribution of fallow lands of the district shows that the fallow lands mostly concerted in the western and eastern mandals of the district. While low concentration is observed in the central southern and eastern part of the district. Very low fallow land concentration mandals are observed along with the river courses T.B. canal and K.C Canal.

Net sown area

The net sown area is very high(above 70%) in 11 mandals, high(60-70%) in 8 mandals, moderate(50-60%) in 12 mandals, low(40-50%) in 74 mandals and very low(below 40%) in 16 mandals.The 11 mandals which possess very high spatial distribution of net sown area are Gospadu 90.00%, Dornipadu 88.09%, Uyyalawada 84.76%, sirvel 82.98%, Koilkuntla 82.07%, Alur 80.58%, Maddikera 80.31%, Chippagiri 79.28%, Nandavaram 74.06%, Tuggali 73.24%, Peddakadubut 73.20%, Gudur 72.85%, Pathikonda 72.47%, Nandyal 72.45%, Sanjamala 71.26% and Yamiganur 70.05%, with Gospadu is ranking first position among mandals in net sown area.

The mandals which posses very low 11 mandals in net sown area out of the total mandals of the district. The net sown area in one mandal of the district namely Srisailam is zero. The spatial distribution of net sown area shows that the concentration is found in the southwest and southeastern mandals of the district.

Very high and high concentration of net shown area is observed mostly in the north-west and adjoined areas of the very high net sown area of east. Moderate and low has found in the central part of the district. The spatial distribution of net sown area of the district is clearly indicating that, the plain area and irrigated area are having high per cent of land under these categories (showing the table-1).

Conclusion

The land can be described "as the nation's ultimate asset to be used for the benefit including the employment, of all" Stamp, (1962, P.425)". Land use plays a significant role in determining human's progress. Naturally, land is a prime natural resource, like conventional resources. The land is neither producible nor increasable. So, optimum utilization of land is a basic responsibility of every individual. Since land is very precious there is ever increasing demand and studies on land use have significantly increased their importance. All over the world studies on land use remarkably indicated for regional development.

Under-utilization, over-utilization and mis-utilization are the main problems of land use. The land available for agricultural purposes and others is statistic and limited. Therefore, the ever-increasing pressure of population and decreasing man-land ratio are posing challenging problems to the land use planners. There is a premium on the horizontal expansion of arable land.

The spatial pattern of land use is complex and dynamic in nature. Spatially, it is variable. "The complex land use pattern in an area manifests the outcome of trail and errors of many thousand years of settlement.

The forest coverage in the district is most uneven. At present Srisailam mandal (Nandyal division) accounts for (95.75%) of its area under forest whereas there is no forest distribution in 16 mandals.

During 2010-11 as many as 45 mandals have very low and low concentration forest coverage. Mandals with no forest coverage are. Srisailam, Mahanandi, Velgodu, Bandi Atmakur Rudravaram, Allagadda, Atmakur and Kottapalli. Out of them some are located in north central part, some are south western part and other are located in south eastern part.

In the district majority of the mandals are having low and very low forest coverage due to more area under cultivation which is mainly supported by K.C Canal Tungabadra HLC (High Level Canal) and monsoon rains. Whereas eastern mandals which are mainly located on Nallamala hill ranges obviously, cover with full of forest in some areas with dense forest. However measures to be taken to improve plantation through social forestry and may brought more area under forest cover to maintain ecological balance and co-friendly environment.

The land under non-agricultural use at district. As many as 38 mandals are having very low and low land under non agricultural concentration. Whereas two mandals have high concentration of land under non agricultural use, out of them two mandals Pagidyal and Owk show more land under non agriculture and fourteen mandals are having moderate non-agricultural coverage.

Obviously, mandals with high forest range will be having less land under non agriculture and mandals with high percentage of cultivated land cover less percentage of land under non agriculture. High percentage of land under non agriculture is found in two mandals namely Pagidyal and Owk because in these mandals stone quarrying for building construction is major activity and famously known as Kurnool stones. Hence the Kurnool district hails strong agricultural background/potential.

In Kurnool district cultivable waste land during 2010-11 is about (3.01%) only. Because, in majority of the mandals cultivation of crops is the majority activity, hence accounted for low percentage in Cultivable Waste land. At mandal level with (20.66%), Krishnagiri occupied first position whereas Dhone mandal with (0.13%) and zero in Srisailam mandal each raked least position. On an average most of the agricultural land is using for crops in every alternative years.

Majority of the low and very low cultivable waste land covering mandals are distributed throughout the district expect north eastern part and some mandals in the western part. High cultivable waste land covering mandals are scattered in the different parts of the district. High cultivable waste land is found due to structure and relief of the land, though it is suitable for cultivation

During 2010-11 the distribution of fallow land. Mandal wise, with (44.78%) Halaharvi has highest share of fallow land and lowest with (0.27%) is found in Gospadu mandal. However Srisailam has no fallow lands, since there in no agricultural area.

Obviously very low and low fallowland coverage mandals are distributed in around water sources available. Whereas high and very high concentration of fallow land coverage mandals are found in the rainfed areas which are mostly located in the western part of the district.

In any region net area sown is the indication of soundness of copped land. In Kurnool district during 2010-11, the

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share of net area sown is (50.37%) out of the total geographical area. Mandal wise Gospadu with (90.00%) ranked first position. Whereas the lowest net area sown is recorded at (23.06%) Kottapalli mandal. High and very high net areas sown are found in as many as 23 mandals mostly concentrated in entire western, central and along with K.C Canal.

Low and very low net area sown are found only in 19 mandals and mostly located in Nallamala hilly region it is found in eastern side and few mandals with low net area sown found, where stone quarrying is the main activity. In Srisailam mandal located in central part of the Nallamala hilly range is not at all having land under net area sown but here and there land under shifting cultivation has been practicing by the local tribal people famously known as Chenchus.

Important findings and suggestion

In the study area cultivation of crops and rearing of animals is an important occupation and it is found that, near about (65%) of the people are engaging on agriculture. Kurnool district is located in drought prone area of the Rayalaseema region.

For any regional development, an administer and the planners must take spatial pattern of landuse for forthcoming developmental activities to be taken at local level and regional level.

In the district, out of the total geographical area majority of the land is under cropped area followed by forest cover, land under non-agriculture use, fallow land and under cultivable waste land.

Majority of the land under non-agriculture use is found in around urban centers and stone quarrying mandals. Majority portion of cultivable waste land is located in the central part of the district. High percent of fallow land is observed in the rain fed cultivated areas which are located in western and central part of the district. In irrigation potential areas and rain fed areas, it is seen that, majority of the net area sown. Whereas low percentage of net area sown is observed in forest covered areas and in stone quarrying areas.

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