

LAND USE AND CROPPING PATTERN IN TELANGANA STATE

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DOI: 10.37648/ijrssh.v10i01.057

Received: 10th February, 2020; Accepted: 09th March, 2020; Published: 19th March, 2020

ABSTRACT

Land is a basic and indispensable resource for agriculture, since it is the main source of our food, shelter and clothing. Efficient and sustainable utilization of resources particularly land and water for agriculture have occupied the Centre stage in the economic agenda of a nation. There is a tremendous pressure on the finite land resources, due to the ever increase in human population, their requirements and became complex. As a consequence of increasing pressure of population, changes are occurring in the land use and cropping pattern. A good amount of agricultural land being lost due to various types of degradation and also conversion to other uses. The developmental activities are essential for the economic progress of any region, but these should aim at conserving resources and their rational use with a minimal adverse impact on the existing system. All these call for developmental planning. Telangana is one of the 29th state in India located in Southern India, it is mainly supported by agriculture. Two important rivers the Godavari and Krishna flow through the state providing irrigation but Farmers in Telangana mainly depend on rain fed water source of irrigation. In Telangana State crops are grown in both kharif and Rabi seasons put together covering an area of 59.45 lakh hectares. The important crops grown are Rice, Maize, pulses, Groundnut, cotton etc.. Based on the climate parameters i.e., rainfall, soils and cropping pattern the state divided into 4 Agro climatic zones. The current study is to develop appropriate land use pattern in crop agriculture for sustainable land and water use to agricultural development in the Telangana state. This study traced the alternative cropping pattern which would maximizes the farm net income at a relatively lower water requirement and lower land requirement. And that would lower the environmental damage

1. INTRODUCTION:

There is a tremendous pressure on the finite land resources, due to the ever increasing demands of the population, the impact of which is seen on the environment. A good amount of agricultural land is being lost due to various types of degradation as also conversion to other uses. All developmental activities are essential for the economic progress of any state. But these should aim a conserving resources and their rational use with a minimal

adverse impact on the existing system. All these call for developmental planning.

The problem of changing agricultural land, its utilization and development in the State had gained importance in recent years. The changing agricultural land use and crop pattern reflects the complex, physical a socio-economic factors. These factors keep on changing except the physical ones which remain static. Under the influence of these socio-economic factors, the cropping pattern gets

modified, and sometimes it is replaced with a long span of time. The current study is to develop appropriate land use pattern in crop agriculture for sustainable land and water use to agricultural development in the Telangana State. Agriculture is the mainstay in Telangana, as more than half of the State's population depends on it for their livelihood.

2. REVIEW OF LITERATURE:

The study of land use is significant in agricultural dominated regions in the world. Many studies were conducted in similar fashion by different agricultural geographers in the recent years. One of the earliest studies was conducted by Mukerjee and J.M. Singh (1967), they pointed out that there was a tremendous change in the cultivated land of Varanasi district during past fifty years (1911-1930) there has been a sharp fall in the dry crops. Owing to the spread of irrigation facilities while paddy and doubled cropping have gained increasing popularity. Jasbir Singh(1975) has made a very comprehensive display of many aspects of Indian Agriculture. He has analyzed the changing land use with special reference to the changes that have taken place since 1951. He has analyzed the factors of farming underlying the changes of land use of the newly colonized areas the stability in the old irrigated ones and the crises in the rain fed regions on the basis of verifiable data. Seelan et al (1983) studies the control exercised by landform over land utilization pattern using remote sensing technique in parts of Southern Uttar Pradesh with varied geomorphic settings and land use patterns. They have given a description of landforms, land use and the methodology adopted for deriving this information from the Landsat data. The relationship between landform and land use was also highlighted. Chatterjee (1987) carried out multi-disciplinary integrated investigations in the drought prone backward district of Puruliya in West Bengal by applying remote sensing techniques, for an appraisal of natural resources and environmental potential and mapping and monitoring land use changes.

3. OBJECTIVES OF THE STUDY:

This paper aims to evaluate changing land use, agriculture cropping pattern and crop intensity and to examine land use change in Telangana state during the 2015-16 and 2018-19.

The objectives of the study as follows:

1. To study the land use pattern in Telangana state
2. To analyze the cropping pattern in the district –wise
3. To analyse the trends in landholding pattern
4. And to examine changes in cropping pattern in Telangana.

5. HYPOTHESIS:

Agriculture in the State depends on the well, tank irrigation facilities and rainfall. Mainly the agricultural productivity of the state is moderate and it is largely being influenced by water resources. The cropping pattern and land use in the state is determined by the quality of land and soil. Net sown area is increasing due to increased availability of water resources.

5. METHODOLOGY:

The secondary data have been collected from socio-economic outlook for 2013-14 and 2014-15 to analyse the land use and cropping pattern. Simple statistical techniques (percentage and average) are used to analyses the changing trend in cropping pattern and crop intensity

$$\text{Crop intensity} = \frac{\text{Gross cropped area} \times 100}{\text{Net sown area}}$$

6. CLASSIFICATION OF GEOGRAPHICAL AREA IN TELNGANA:

Crop and land use statistics form the backbone of the Agricultural Statistics System. Reliable and timely information on crop area, crop production and land use is of great importance to planners and policy makers for efficient agricultural development and for taking

decisions on production, procurement, storage, public distribution, export, import and many other related issues. Prior to 1950-51, the land utilization statistics were available under five categories namely forest, area not available for cultivation, other uncultivated land excluding current fallows, fallow lands and net sown area. This classification was found to be insufficient to meet the needs of agricultural planning and later a more detailed nine-fold classification on land use with standard definitions and concepts were adopted by the government. These are as follows.

- i. **Forest**-Area under forest includes all lands classified as forests under any legal enactment dealing with forests, whether State owned or private. The area of crop raised in the forest and grazing lands or area for grazing within the forests is also included under the forest area.
- ii. **Land Put to Non-Agricultural purposes** – This includes all lands occupied by buildings, roads, and railways or under water like river and canals and land put to uses other than agriculture.
- iii. **Barren and Unculturable Land** – This covers all barren and uncultivable land like mountains, deserts etc. and land includes all such land whether in isolated blocks or within cultivated holdings.
- iv. **Permanent Pastures and Other Grazing Lands** – This covers all grazing lands, whether they are permanent pastures and meadows or not. Village common grazing lands are also included here.
- v. **Miscellaneous Tree Crops and Groves** – This includes land not counted as net sown area but put to some agricultural use. Lands under casurina trees, thatching, grass, bamboo bushes and other groves for fuel etc. not included under orchards shall be included in this category.

- vi. **Cultivable Waste** – These includes all lands available for cultivation whether not taken up for cultivation or taken up for cultivation once and left uncultivated during the current year or last five years in succession.

AGRO CLIMATIC ZONES IN TELANGANA:

Telangana State is divided into four agro-climatic zones based on the geographical characteristics such as rainfall, nature of soils, climate etc.: i) Northern Telangana Zone, ii) Central Telangana Zone, iii) Southern Telangana Zone and iv) High Altitude and Tribal Zone.

i. Northern Telangana zone: This zone includes Adilabad, Karimnagar and Nizamabad districts spreading over a geographical area of 35.5 sq. km. Annual rainfall ranges from 900 mm to 1150 mm, received mostly from south west monsoon. Maximum and minimum temperatures during this season ranges between 21⁰C - 25⁰C and 32⁰C -37⁰C respectively. Red soils are predominant in this zone, which include chalkas, red sands and deep red loams along with very deep black cotton soils. Rice, maize, soya been, cotton, red gram, and turmeric are important crops grown in this zone etc.

ii. Central Telangana zone: This zone includes Medak, Warangal and Khammam districts and receives an annual rainfall of 800 mm-1150 mm. This zone spreads over a geographical area of 30.6 sq. km. Maximum and minimum temperatures during south west monsoon ranges between 21⁰C-25⁰C and 22⁰C-37⁰C respectively. Red soils are predominant which includes chalkas, red sands and deep red loams along with very deep black cotton soils. Important crops grown in this zone include cotton, rice, maize, green gram, mango, and chillies etc.

iii. Southern Telangana zone: This zone comprises the districts of Rangareddy, Hyderabad, Mahabubnagar and Nalgonda, spreading over a geographical area of 39.3 sq. km. The annual rainfall is 600 mm -780mm Maximum and minimum temperatures during south west monsoon ranges between 28⁰C-34⁰C and 22⁰C-23⁰C respectively.

This zone is predominantly red soil track having red with loamy sub-soil, i.e., chalkas. Important crops grown in the zone includes cotton, rice, red gram, maize, and green gram etc.

iv. High Altitude and Tribal zone: This zone consists of the areas along Northern and Eastern borders of Adilabad and Khammam districts, spreading in about 4.66 sq. km and is mostly inhabited by Tribal population. The annual rainfall is around 1400 mm. Important soils in this zone include red sandy loams, red loams with clay base along with very small patches of alluvial soils. The maximum and minimum temperatures during south west monsoon ranges between 13°C - 27°C and 29°C - 34°C respectively. Important crops grown in this zone include chillies, rice, cotton and horticultural crops etc.

7. LAND UTILIZATION PATTERN IN TELANGANA:

Telangana state is richly endowed with variety of soils, ranging from highly fertile alluvial to very poor sandy soils. Red soils are predominant with 48% of the land,

while Black cotton soils, alluvial, rocks and boulders share 25%, 20% and 7% respectively

The geographical area of the Telangana State is 114.84 lakh hectares, of which 43.20 percent is under Net Area Sown (49.61 lakh hectares), 23.89 percent is Forest Land (27.43 lakh hectares), 8.36 percent is Current Fallow Lands (9.60 lakh hectares), 7.79 percent Land is put to Non-Agricultural uses (8.95 lakh hectares), 5.36 percent is Barren and uncultivable land (6.15 lakh hectares) and 6.2 percent falls under Other fallows (7.17 lakh hectares) and remaining 5.2 percent is under Cultivable waste, Permanent pastures and other grazing lands, and Land under miscellaneous tree crops and groves are not included in the Net Area Sown (5.93 lakh hectares) in 2013-14. Whereas in 20014-15 about 39 percent is under agriculture and around 23 percent is under forest cover. Land put to non-agriculture uses is around 8 percent. Details of land utilization pattern are given in table 7.1.

Table 7.1 Land Utilization Pattern in Telangana

Major land use categories	2015-16 (area in lakh hectares)	2018-19 (area in lakh hectares)
Area under Forests	27.43 (23.89 percent)	25.4 (22.7 percent)
Barren and Uncultivable land	6.5 (5.36 percent)	6.1 (5.4 percent)
Land put to Non-Agri. Uses	8.95 (7.79 percent)	8.8 (7.9 percent)
Culturable waste	1.78 (1.55 percent)	1.8 (1.6 percent)
Permanent pastures and other grazing lands	3.01 (2.62 percent)	3.0 (2.7 percent)
Land under Misc. Trees crops groves not included in NAS	1.14 (0.99 percent)	1.1 (1 percent)
Other Fallow Lands	7.17 (6.24 percent)	8.1 (7.23 percent)
Current Fallow lands	9.60 (8.36 percent)	14.0 (12.5 percent)
Net Area Sown	49.61 (43.20 percent)	43.8 (39.0 percent)

Source: Director of Economics and statistics, Hyderabad

IRRIGATION IN TELANGANA:

Irrigation plays an important role in increasing agricultural productivity. The Gross Area Irrigated in the State during 2015-16 was 25.29 lakh hectares as compared to 31.54 lakh hectares in previous year, showing a negative growth of -20 percent. Similarly net area irrigated came down from 22.8 lakh hectares (2014-15) to 17.26 lakh hectares (2015-16), showing a negative growth of -24 percent during the same period. Source wise distribution reveals that wells are main source of irrigation in the State, irrigating about 82% of the total net irrigated area in 2015-16. The share of canal and tank irrigation is confined to mere 10 percent and 4 percent respectively. Looking at trends of irrigation in Figure 3.8 (with triennium average) over a period of 60 years in Telangana reveals that there is a significant change in the usage pattern of major source of irrigation. While the tank and canal irrigation shows a declining trend over the years, the well irrigation shows a faster growth rate since 1985-86. The well irrigation which was 16 percent in 1955-56 was increased to 84% in 2015-16. The tank irrigation was three times higher than the well and canal irrigation in 1956-57. Over a period of time, it has declined significantly. In the year 1956-57 the percentage share of tank irrigation was 65% which declined to 10% in 2015-16. This is a clear indicator of deliberate neglect of thousands of tanks built during the Kakatiya's period. High

dependency on wells have adverse effect on groundwater levels, therefore there is a need to increase tank and canal irrigation sources in the State. Hence, the Government has launched "Mission Kakatiya" to revive and rejuvenate tank irrigation. Government has also proposed to reengineer the canal irrigation projects and allocating substantial portion of budget to canal irrigation.

8. LANDHOLDING PATTERN IN TELANGANA

Land resource is a vital input for agriculture. Average landholding in Telangana in 2015-16 was 1.12 hectares (2.8 acres) as against the all India average of 1.16 hectares. Increase in population has put pressure, leading to fragmentation of landholdings. As shown in the Table 8.1, the share of marginal and small landholdings constitute about 86 percent of total landholdings in Telangana State in 2015-16, while their share in total area was around 55 percent. About 14 percent of total landholdings in the State were medium, ranging between 2 to 10 hectares, whereas their share in total area was 40.5 percent. District wise analysis shows that average landholding size was less than one hectare in Nizamabad, Karimnagar, and Medak districts showing skewed land distribution in the State.

Table 8.1: Percentage Distribution of Landholding and Area in Telangana 2015-16

Sl. No.	District	Marginal (Up to 1.0 ha)		Small (1.0 - 2.0 ha)		Medium (2.0 - 10.0 ha)		Large (10.0 ha & above)		Avg. Land- holding Size (ha)
		Number (%)	Area (%)	Number (%)	Area (%)	Number (%)	Area (%)	Number (%)	Area (%)	
1	Adilabad	49.8	16.9	27.7	28.3	22.1	50.1	0.4	4.8	1.40
2	Nizamabad	67.5	33.9	23.8	36.1	8.6	28.5	0.1	1.5	0.92
3	Karimnagar	67.5	30.9	21.9	31.8	10.5	34.7	0.2	2.6	0.96
4	Medak	67.9	29.9	21.7	31.3	10.0	34.4	0.3	4.4	0.97
5	Hyderabad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
6	Rangareddy	58.3	23.5	25.7	29.4	15.6	42.0	0.4	5.1	1.22
7	Mahabubnagar	57.9	22.0	25.4	29.5	16.3	44.0	0.4	4.5	1.23

8	Nalgonda	58.8	23.1	25.3	29.9	15.6	43.4	0.3	3.6	1.19
9	Warangal	67.1	28.6	21.4	29.7	11.2	37.0	0.3	4.7	1.01
10	Khammam	62.2	25.6	22.6	27.6	14.9	42.6	0.3	4.3	1.14
	Total	62.0	25.3	23.9	30.2	13.9	40.5	0.3	4.0	1.12

Source: Statistical Abstract of Telangana-2015, DES, Government

As compared with all India level, landholding pattern in Telangana is more evenly distributed. While 85 per-cent of total landholdings at all-India are marginal and small landholdings, farmers possess only 44 percent of total land as against, 86 percent of total landholdings in Telangana are marginal and small possessing 55 percent of total landholdings.

9. CROPPING PATTERN:

Cropping pattern means the proportion of area under various crops at a point of time. Cropping pattern is however, a dynamic concept as it changes over space and time. The cropping pattern of a region is closely influenced by the geo-climatic, socio-cultural, economic, historical and political factors. The cropping pattern is influenced by the physical factors such as soil, climate; technological factors like irrigation, improved varieties of seeds, availability of fertilizers, and plant protection chemicals; institutional factors like land reform, consolidation of holdings, credit facilities, price structure, procurement policies, and storage facilities.. Climate plays a crucial role in determining the existing cropping pattern. From the time the crops are sown, till the produce is harvested and stored they are more or less at the mercy of the climate. Any abnormalities in the climate during the growing season, such as delay in the outbreak of rains, dry spells or excess rains, too high or too low temperatures would seriously affect the growth and final yield of the crop. The cropping pattern vary from region to region due to the variation in the terrain, slope, temperature, amount and reliability of rainfall, soils, availability of water for irrigation, use of fertilizers, pesticides and mechanization.

Changes in cropping pattern refer to changes in proportion of area under different crops at two

different times. Such changes, though governed by ecological situation, socio-economic and technological factors also determine which of the feasible crops the farmers will choose. The ensuring section therefore, deals with the cropping pattern and changes in for individual crops in general and irrigated crops in particular in the state.

10. AREA UNDER FOOD AND NON-FOOD CROPS:

Net Cropped Area (NCA) in Telangana in the year 2015-16 was 43.8lakh hectares, while Gross Cropped Area (GCA) was about 53.2 lakh hectares. Out of the total GCA, 30.7 lakh hectares (58 percent) was under food crops and 22.5 lakh hectares (42 percent) was under non-food crops. The important food grains cultivated in the State are rice, maize, jowar, bajra, pulses, etc. Cotton is an important non-food crop accounting for 32 percent of total GCA in the State.

Foodgrain crops (i.e., rice, wheat, coarse cereals and pulses) were cultivated in 26.1 lakh hectares in 2015-16, with a production of 72.2 lakh tonnes of food grains. Cultivated area under rice crop was about 14.2 lakh hectares in 2015-16, with a production of 45.5 lakh tonnes. Area under pulses was 4.1 lakh hectares in 2015-16 with the production of 2.6 lakh tonnes. Other important crops in 2015-16 include coarse cereals occupying 15 percent of total GCA, followed by pulses 8 percent and oil seeds 9 percent.

The production of food grains including cereals, millets and pulses has been estimated to be about 49.35 lakh tonnes in the current (2018-19) agriculture year as against 72.2 lakh tonnes last year. A sharp decrease in the production of paddy, the staple food in the State, has pulled down the total produce of food crops. Paddy output is estimated to

be less than 30 lakh tonnes this year as against over 45.5 lakh tonnes last year.

Similarly, the production of pulses is estimated to be 2.5 lakh tonnes this year, against 2.6 lakh tonnes last year. The oilseeds production is likely to be 4.73 lakh

tonnes as against 7.22 lakh tonnes last year. The details of Area and Production of food and non- food crops in 2015-16 and 2018 -19 are given in Table 10.1.

Table 10.1: Area, Production, and Yield during 2015-16 & 2018-19

Crops	Area (Lakh Hectares)			Production (lakh tonnes)			Yield (kg/hectare)		
	2015-16	2018-19*	% Dev.	2015-16	2018-19*	% Dev.	2015-16	2018-19*	% Dev.
Rice	14.15	9.51	-33	45.45	29.79	-34	3211	3132	-2
Maize	6.92	5.56	-20	23.08	16.19	-30	3338	2912	-13
Cereals & millets	22.05	15.91	-28	69.55	46.85	-33	3155	2945	-7
Pulses	4.08	4.55	12	2.63	2.5	-5	644	549	-15
Food grains	26.13	20.46	-22	72.18	49.35	-32	2763	2412	-13
Groundnut	1.55	1.18	-24	2.95	1.82	-38	1907	1542	-19
Soyabean	2.43	2.44	0	2.62	2.55	-3	1081	1045	-3
Oil seeds	5	4.36	-13	7.22	4.73	-34	1442	1085	-25
Sugarcane	0.38	0.58	53	33.43	27.93	-16	87654	79795	-9
Cotton	16.93	17.78	5	35.83	36.08	1	360	345	-4

Source: Directorate of economics and statistics, Hyderabad.

The prospects in Rabi season appear to be even worse, as the area under food crops sown is 5.32 lakh hectares, as against the normal area of 10.08 lakh hectares, showing the deficiency of 47% over normal area. Paddy is the worst-hit crop due to prevailing adverse seasonal conditions.

District-wise analysis:

Among 10 districts of Telangana, Mahabubnagar, with 9.78 lakh hectares of land stand largest in terms of Gross Cropped Area in 2015-16, followed by Nalgonda and Karimnagar with 7.3 lakh and 7.0 lakh hectares, respectively.

Cereals, Millets and pulses occupy more than 50 percent of total GCA in Nizamabad, Karimnagar, Medak, Rangareddy and Mahabubnagar districts. Nalgonda (with 44 percent GCA) and Karimnagar districts (with 40 percent GCA) stand at the top in terms of area and production of rice in the state. With 2.10 lakh hectares area under coarse cereals, Mahabubnagar stands first in terms of area under coarse cereals and Karimnagar district stand first in terms of production of coarse cereals with 5.46 lakh tonnes. District-wise area and production of foodgrain during the year 2015-16 is shown in Figure 3.1. Cotton is a major non-food crop in

Warangal, Karimnagar, Nalgonda, Adilabad and Mahabubnagar districts. The prospects in Rabi season appear to be even worse, as the area under food crops sown is 5.32 lakh hectares, as against the normal area of 10.08 lakh hectares, showing the deficiency of 47% over normal area. Paddy is the worst-hit crop due to prevailing adverse seasonal conditions.

11. LANDHOLDING PATTERN IN TELANGANA

Land resource is a vital input for agriculture. Average landholding in Telangana in 2015-16 was 1.12 hectares (2.8 acres) as against the all India average of 1.16 hectares. Increase in population has put pressure, leading to fragmentation of landholdings. As shown in the Table 3.4, the share of marginal and small landholdings constitute about 86 percent of total landholdings in Telangana State in 2015-16, while their share in total area was around 55 percent. About 14 percent of total landholdings in the State were medium, ranging between 2 to 10 hectares, whereas their share in total area was 40.5 percent. District wise analysis shows that average landholding size was less than one hectare in Nizamabad, Karimnagar, and Medak districts showing skewed land distribution in the State.

FARM MECHANIZATION:

Mechanization of agriculture will help in increasing the productivity and reduce the cost of cultivation and also enable the farmer to complete farming operations in time. Farm mechanization in the State is accentuated by the shortage in agriculture labour due to increased migration of rural workers to urban areas. Mechanization possibility is strongly influenced by the farm size, cost of farm labour, machines and energy. However, most of the farming is carried out on small holdings in the State, farming system continues to utilize manual power, animal power and tractor power. In order to bring more land under cultivation and to improve productivity per unit area it is necessary to introduce other sources of power like tractors,

power tillers and renewable energy. Depending on the types of crops grown, soil conditions, local situations and requirements in the districts, the Government is contemplating to distribute various farm machinery and implements on subsidy basis.

TELANGANA AS THE SEED BOWL OF INDIA:

Seed is the basic and vital input that could increase crop yields substantially, provided good management practices are followed with other inputs. Availability of diverse agro-climatic regions with cool and dry weather conditions round the year, made Telangana a congenial place for cultivating crops and production of quality seed. Since Hyderabad has excellent logistic services facilities and strategically located in the middle of the country connecting East-West and North-South, there is a high potential for the State to become a 'Seed Bowl of the Country'.

The State produces around 37.42 lakh quintals of seeds of various crops every year, consisting of paddy, hybrid paddy, maize, cotton and Bengal gram etc. At present, about 90-95% of hybrid rice seed production in the country is being taken up by different seed companies in Warangal and Karimnagar districts. Nizamabad supplies 100 percent seed requirements of hybrid jowar and bajra for the country.

12. CONCLUSIONS:

The increase population, the pressure on land to cause diversified nature of land use pattern and cropping pattern of the Telangana state has increased the cropping intensity of the land. The cropping pattern of the state has changed towards commercialization due to increase in tank and well irrigation facilities, transport, communication, market facilities etc. In present scenario the state needs to adaptation of forestation, changing in the cropping pattern mechanization, rural communications, development of farmers and labourers. Hence, to promote agriculture development and restore the ecological balance in the state.

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