Volume : 2 | Issue : 8 | August 2013 • ISSN No 2277 - 8179

Research Paper

The Economic Study of Structural Growth of Agriculture Under Globalization in Chittoor District of Andhra Pradesh

Agriculture

KEYWORDS :

Dr. V. Subramanyam — Senior Research Fellow (NAIP) National Agricultural, Innovative Project, S. V. Agricultural College, Tirupati. Andhra Pradesh.

Dr. M. Raghava Reddy — Lecture in Economics, S.R.Govt. Degree College, Punganur, Andhra Pradesh.

ABSTRACT

Agriculture in India contributed to 14.1 per cent of Gross Domestic Product at constant (2004–05) prices during the year 2011-12. Its share in total employment according to 2001 censes continued to be as high as 58.2 per cent. The growth target of agriculture in the Eleventh as well as Twelfth five years plans has been mentioned at 4 per cent, though the actual growth rate of agriculture in India was at 2.5 per cent. In this context, it is imperative to know the structural growth rates at the District evel, Regional level and State level. Considering this the authors in their paper studied the structural growth of agriculture in Chittoor Distric, Rayalaseema, Andhra Pradesh and India. The Annual compound growth rate of population in Chittoor District was 1.4 per cent. Nearly 68 per cent of the workers were engaged in agriculture sector in Chittoor District during the year 1991 and thereafter the same was gradually declined to 27 per cent. 62 per cent of population depended on agriculture in Chittoor District. The total irrigated area during the 1979 was 1,55.110 hectares, of which wells occupied 52 per cent and tanks had share of 41 per cent. agricultural use was nearly 10 per cent in the year 2008. Net sown area comprised nearly 26 per cent of the total geographical area in Chittoor District. Nearly 60 per cent of the farmers in the District belong to small and marginal farmers category, whereas large constituted only 4 per cent. The share of food crops was 51 per cent, which was nearly equal to non-food crops (49 per cent). Rice, groundnut and sugarcane were the principle crops of the District. The growth rates of principle crops were worked out considering the two periods ie., Pre- Globalization period (1980-94) and Post-Globalization period (1995-2009) .The compound growth rates of these crops in respect of area were negative by and large, but yield growth rates were positive and slightly increased due to new technologies adopted by the farmers. Similarly, the growth rates of principle crops in respect of area, yield and production variables were worked out in Rayalaseema region, Andhra Pradesh and India. Finally, suitable measures to accelerate growth rates in principle crops were indicated in their research paper.

I. Population

Chittoor district is the smallest in area but most populous among Rayalaseema districts of Andhra Pradesh. The population of the district, according 2001 census, was 3745875, forming 4.91 per cent of state's total population. Out of total population of the district, 29, 34,845 (78.35 per cent) are rural and 8,11,030 (21.65 per cent) are urban. The growth of population in the district between 1901 and 2001 is shown in Table 1.

Table I
Growth of Population in Chittoor District

Year	Population (persons)	Variation(+) or (-)		Density of Population (Per sq. Km.)
		No. of persons	Annual Compound Growth	
1941	14,97,778	1,66,261	1.18	99
1951	16,66,741	1,68,963	1.07	110
1961	19,15,331	2,48,590	1.40	126
1971	22,85,536	3,70,205	1.78	151
1981	27,37,316	4,51,780	1.82	181
1991	32,61,118	5,23,802	1.77	215
2001	37,45,875	4,84,757	1.40	247

Source: The Hand Book of Statistics, Chief Planning Officer, Chittoor District,p.1.
Table.I From 1951 to 1991 the population had increased by 85.05 per cent.

In the year 2001 the density of population of the district was 247 persons per sq.km. as against 201.5 in Rayalaseema and 277 in Andhra Pradesh. According to 1961 census, the literates constituted 22 per cent (4 lakh persons) of total population in Chittoor district. There was a considerable improvement in literacy in the district over the years. The percentage of literates to total population had increased from 25 per cent in 1971, to 32 per cent in 1981, to 43 per cent in 1991 and 66.8 per cent in 2001. With the launching of literacy programmes, viz., Akshara Thapashman, Akshara Sankranthi, Continuing Education, the district is reported to have reached near total literacy.

II. Distribution of workers

Table II
Distribution of Workforce in Various Sectors in Chittoor District (1991 and 2001)

Sector	1991			2001		
	No. of Persons	Percentage to Total	Percentage of Workers to Total Population	No. of Persons	Percentage to Total	Percentage of Workers to Total Population
I. Agricultural Sector						
(a) Cultivators	530279	35.20	16.28	290289	16.71	7.75
(b) Agricultural Laborers	492778	32.71	15.13	629527	36.24	16.81
II Non-Agricultural Sector						
(a) Household Industry	49017	3.25	1.51	54417	3.13	1.45
(b) Marginal Workers	100929	6.70	3.10	290289	16.71	7.75
III Other Workers	333526	22.14	10.24	472758	27.21	12.62
Total Working Population	1506529	100	46.27	1737280	100.00	46.38

Source: The Handbook of Statistics, Chief Planning Officer, Chittoor District.(2008-2009)

The table I reveals the distribution of workforce in different sectors in Chittoor district during 1991-2001. Out of the total population of Chittoor district workers accounted for over 46 percent in both 1991 and 2001. About 68 per cent of workers were engaged in agricultural sector in 1991, whereas in 2001 the share of this sector had come down to 53 per cent. This may be due to increased employment opportunities in non-agricultural sector, the share of which had risen from around 10 per cent to about 20 per cent during the period. The proportion of other workers rose from 22 per cent to 27 per cent. It can be said that workforce in agriculture sector has gradually declined over the period.

Volume : 2 | Issue : 8 | August 2013 • ISSN No 2277 - 8179

III. Irrigation

The rivers flowing in the district are non-perennial in nature and remain dry for most of the period in the year. The important rivers in the district are the Ponnai, which is a tributary of Paler river and the Swarnamukhi, which rises in the Eastern Ghats, touches 7 mandals and finally enters Nellore District. Other important rivers of the district are Kushasthali, Pincha, Bahuda, Kalyani, Araniyar and Pedderu. Besides the above rivers, there are a number of small hilly streams flowing in the district.

There are 8 medium irrigation projects in the district. They are Swarnamuki, Araniyar, Mallimadugu, Kalangi, Bahuda, Siddalagandi Pedderu projects and Krishnapuram reservoir. The total registered ayacut under the above projects is 1527 hectares. There are 7512 minor irrigation tanks with a total ayacut of 54336.14 hectares. The district occupies a prominent place in the number of irrigation wells totaling to 1, 16,239. Different sources of irrigation in Chittoor District are shown in table. III

Table III
Net Area Irrigated by Different Sources in Chittoor District (in hectares)

Year	Tanks	Canals	Tube Wells	Other Wells	Other Sources	Total Irrigated Area
1955-56	71411 (55.63)	3428 (2.67)	-	40715 (31.72)	12813 (9.98)	128367 (100)
1959-60	86906 (65.72)	-	16 (0.01)	32031 (24.22)	13287 (10.05)	132240 (100)
1964-65	103839 (68.23)	-	-	39841 (26.18)	8510 (5.59)	152190 (100)
1970-71	81285 (53.92)	-	-	60900 (40.40)	8567 (5.68)	150752 (100)
1974-75	65978 (43.31)	2192 (1.44)	-	77399 (50.81)	6759 (4.44)	152328 (100)
1979-80	63843 (41.16)	5554 (3.58)	680 (0.44)	79934 (51.53)	5099 (3.29)	155110 (100)
1984-85	54491 (38.90)	2678 (1.91)	1922 (1.37)	78618 (56.13)	2354 (1.68)	140063 (100)
1989-90	51559 (34.24)	1352 (0.90)	5725 (3.80)	90948 (60.40)	980 (0.65)	150564 (100)
1994-95	34593 (22.66)	1516 (0.99)	20316 (13.31)	95840 (62.79)	382 (0.25)	152647 (100)
1999-00	25073 (14.52)	239 (0.14)	45941 (26.61)	101200 (58.62)	195 (0.11)	172648 (100)
2004-05	16878 (13.34)	45 (0.04)	71737 (56.69)	37850 (29.91)	24 (0.02)	126534 (100)
2006-07	21065 (13.38)	35 (0.02)	98522 (62.59)	37748 (23.98)	39 (0.02)	157406 (100)
2008-09	24108 (12.85)	320 (0.17)	130091 (69.33)	33084 (17.63)	26 (0.01)	187629 (100)

Note: Figures in brackets are percentage to total irrigated area 2) - : Nil / negligible.
Source: 1. Compendium of Area and Land Use Statistics of Andhra Pradesh (1955-56 to-2004-2005), Directorate of Economics and Statistics, Government of Andhra Pradesh.
2. Hand Book of Statistics, Chief Planning Officer District (2008-2009)

Table 3.5 shows that the proportion of area irrigated by tanks declined from 55.63 per cent in 1955-56 to 12.85 per cent in 2008-09. Tube wells, whose share was hardly 1 per cent rose to over 69.33 per cent by 2008-09 and became the predominant source of irrigation. Wells, which accounted for over 31 per cent in 1955-56 increased to 62.79 per cent in 1994-95 but declined to 17.63 per cent during 2008-09. The canal irrigation declined from 3.58 per cent in1979-80 and 0.17 per cent in 2008-09. Similar trend is observed in respect of other sources.

IV. Land Utilization

The pattern of land utilization during the period from 1955-56 to 2008-2009 in the district is furnished in table IV

Table IV
Land Use Pattern in Chittoor District (in hectares)

Item	1955-56	1959-60	1969-70	1979-80	1989-90	1999-00	2008-09
Forest Area	484411 (31.76)	328101 (23.50)	454159 (30.01)	453356 (30.25)	453355 (30.25)	451341 (30.11)	452018 (28.85)
Barren Land	169166 (11.09)	225951 (16.18)	184192 (12.17)	169127 (11.28)	166215 (11.09)	164282 (10.96)	163650 (10.80)
Land put to Non-Agri-Uses	60702 (3.98)	97270 (6.970	132820 (8.78)	136563 (9.11)	140043 (9.34)	142362 (9.50)	148529 (9.80)
Cultivable waste	147783 (9.67)	114365 (8.19)	81515 (5.38)	55239 (3.69)	50841 (3.39)	42049 (2.81)	41691 (2.75)
Permanent Pastures	32592 (2.13)	43951 (3.15)	46460 ()3.07	45842 (3.06)	40873 (2.73)	36821 (2.46)	33769 (2.23)
Miscellaneous trees	26411 (1.73)	11310 (0.81)	29021 (1.92)	28941 (1.93)	26951 (1.80)	25467 (1.70)	35496 (2.25)
Other Fallows	48201 (3.16)	44401 (3.18)	64173 (4.24)	71804 (4.79)	103241 (6.89)	96276 (6.42)	114920 (7.58)
Current Fallows	168056 (11.02)	129869 (9.30)	67692 (4.47)	53367 (3.56)	43551 (2.91)	117680 (7.85)	134536 (8.88)
Net Area Sown	388357 (25.46)	400956 (28.72)	453564 (29.96)	484531 (32.33)	473700 (31.60)	422481 (28.19)	390487 (25.77)
Geographical Area	5125379 (100)	1396174 (100)	1513596 (100)	1498770 (100)	1498770 (100)	1498770 (100)	1515100 (100)

Source: 1) Compendium of Area and Land use Statistics of Andhra Pradesh (1955-56 to 1990-2000), Directorate of Economics and Statistics, Government of Andhra Pradesh 2) Hand Book of Statistics, Chief Planning Officer, District (2008-2009)

Table IV shows that the proportion of area under forest in the total geographical area, which had fallen from 31.76 per cent in 1955-56 to 23.50 per cent in 1959-60, stood at a little over 30 per cent during the next four decades. In the year 2008-2009 the area under forest had fallen to 28.85 per cent. The percentage of area to total geographical area had risen initially and had fallen during the subsequent decades in the case of barren land and permanent pastures. The proportion of land put to non- agriculture uses exhibited an upwards trend as it rose continuously from 3.98 per cent to 9.80 per cent between 1955-56 and 2008-09. Similar trend is observed in the case of other fallows. In the case of cultivable waste and current fallows we notice a declining trend. Miscellaneous trees and other fallows exhibited declining trend with fluctuations in-between. The net area sown increased from 3.88 lakh hectares in 1955-56 to 4.84 lakh hectares in 1979-80. However, the net area sown had shown a

declining trend during the subsequent three decades and stood at 3.9 lakh hectares in 2008-09. This is indicated by the percentage of net area sown to total geographical area which rose from 25.46 per cent to 32.33 per cent between 1955-56 and 1979-80 and had shown a declining trend subsequently. This might be due to increase in the area put to non-agricultural uses resulting from urbanization and industrialization.

Table V
Compound Growth Rates of Rice, Groundnut and sugarcane in Chittoor District (in percentages)

Year	Before Globalization (1981-1994)			After Globalization (1995-2010)		
	Area (in hectares)	Yield (Kg/ha)	Production (in tonnes)	Area (in hectares)	Yield (Kg/ha)	Production (in tonnes)
Rice	-1.28	1.66	-0.72	-6.08	1.92	-4.12
Groundnut	2.31	1.3	3.8	-5.03	-1.97	-5.58
Sugarcane	3.22	3.22	1.48	-0.38	4.84	-5.24

Source: Ministry of Agriculture Government of India. The data were optioned from the websites, as well as statistical statistical websites at distract level, Andhra Pradesh and all India level.

· Growth were calculated and presented using the Micro soft Excel programme available in the computer.

Table V Provides information on compound growth rates of area, yield and production variables of rice, groundnut and sugarcane crops in Chittoor District for the two periods ie., before globalization period (1981-1994) and after globalization period (1995 to 2010). In the period-I, the production of groundnut variable yield and production variables had compound growth rate of 3.8 which was mainly due to its area growth rate for groundnut crop. In period-I area and yield variables registered compound growth rate of 3.22 for sugarcane crops.

` In the period-II (after globalization period) all the area and production variables had negative compound growth rates for the three principle crops. But the yield variable had positive growth rate in case of sugarcane (4.84) and for rice crops the yield growth rate was 1.92. This was mainly due to new technologies evolved in sugarcane and rice.

Table VI
The compound growth rates of area under cereal crops viz., Jowar, Bajra Ragi and total cereals in Chittoor District (in hectares)

Year	Before Globalization (1981-1994)	After Globalization (1995-2010)
Jowar	-9.05	-6.39
Bajra	-14.27	-2.69
Ragi	-8.52	-2.97
Total Cereals	-4.32	-5.66
Food crops	-1.58	-1.07
Non-food crops	2.55	-4.42
Total cropped crops	0.57	-2.7

Source: 1. Compendium of Area and Land use statistics of Andhra Pradesh (1981 to 2004). Directorate of Economics and Statistics, Government of Andhra Pradesh.
2. Various Government of Andhra Pradesh season and crop Reports.
Hyderabad Bureau of Economics statistics.

In the table VI, Area compound growth rates of principal crops in Chittoor District were worked out and furnished for both the periods. Area under and principal crops registered negative compound growth rates. The highest negative growth rate was observed in the area of bajra Crop (-14.27). jowar had negative growth rate -9.05 in period-I, but the same was -6.39 in period-II. Similarly, area of food crops registered negative growth rates (-1.58 and -1.070) in the two periods. But all the contrary area growth rates of non-food crops had positive growth rates (2.55) per cent. But in period -II the same was -4.42 per cent.

Table VII
Compound growth rates of area, production and yield of principle crops in Rayalaseema for the period 1997 to 2012)

Year	Globalization (1997-98 to 2012)		
	Area (in hectares)	Yield (Kg/ha)	Production (intonnes)
Rice	0.47	1.36	1.95
Groundnut	-0.69	0.22	-2.71
Sugarcane	-3.37	0.19	-3.5

Source: Ministry of Agriculture government of India.

Table VII provides information on compound growth rates of principal crops in percentages in respect of area yield and production variables for the period 1997 to 2012. For rice crops in Rayalaseema production variable registered a positive growth rate (1.95) per cent. But yield growth rate was only 1.63 per cent. The growth rate of area was less than 0.5 per cent. Sugarcane and groundnut crops registered negative growth rates in production and area variables. Highest negative growth rates were seen in case of sugarcane -3.9 per cent. However, yield growth rates were slightly positive for groundnut and sugarcane in Rayalaseema region.

Table VIII
Compound growth rates of principal crops in respect of area yield and production variables in Andhra Pradesh for the period I and II (Area in lakh hectares)

Year	Before Globalization (1981-1994)			After Globalization (1995-2010)		
	Area (in hectares)	Yield (Kg/ha)	Production (in tonnes)	Area (in hectares)	Yield (Kg/ha)	Production (in tonnes)
Rice	0.55	1.93	2	-0.1	2.70	1.9
Jowar	0.64	1.47	-4.93	-7.56	5.81	-1.77
Cereals	-0.33	3.54	0.35	-0.38	2.50	2.98
Foodgains	-0.3	2.89	-0.59	0.3	1.88	3.26
Sugarcane	1.55	-0.15	1.41	1.07	0.53	1.45
Groundnut	1.28	2.01	4.48	-12.48	-2.03	-3.17

Source: Statistical abstracts of various issues. Ministry of Agriculture Government of Andhra Pradesh.

Table VIII Provides information on compound growth rates of principal crops in respect of area, yield and production variables in Andhra Pradesh for the period I and II. Yield variable for cereals and foodgrains were having higher compound growth rates, followed by rice and jowar in period-II .But in period II jowar and rice had higher positive growth rates, followed by rice and cereals. The growth rates of area variables were having negative growth rates in case of groundnut, jowar and cereals.

Volume : 2 | Issue : 8 | August 2013 • ISSN No 2277 - 8179

Table IX
Compound growth rates of principal crops in respect of area, yield, and production in Andhra Pradesh for the two periods (Area in lakh hectares)

Year	Before Globalization (1981-1994)			After Globalization (1995-2010)		
	Area (in lakh hectares)	Yield (Kg/ha)	Production (in lakh tonnes)	Area (in lakh hectares)	Yield (Kg/ha)	Production (in lakh tonnes)
Rice	0.55	1.93	2.00	-0.1	2.70	1.9
Jowar	0.64	1.47	-4.93	-7.56	5.81	-1.77
Cereals	-0.33	3.54	0.35	-0.38	2.50	2.98
Foodgrains	-0.3	2.89	-0.59	0.3	1.88	3.26
Sugarcane	1.55	-0.15	1.41	1.07	0.53	1.45
Groundnut	1.28	2.01	4.48	-12.48	-2.03	-3.17

Source: Statistical abstracts of various issues. Ministry of Agriculture Government of Andhra Pradesh.

Table IX provides information on compound growth rates of principal crops in respect of area, yield, and production in Andhra Pradesh for the two periods yield growth rates of principal crops of Andhra Pradesh were at higher level than the production growth rates. Highest yield growth rates were seen for crops like jowar, rice, cereals and food grains in period-II. In the same period in respect of area variable of groundnut of jowar had negative growth rates. But in the period-I area variables had marginal growth for sugarcane (1.55 per cent) and groundnut (1.28 per cent. In the period-II food-grains had positive growth rates (3.26 per cent) in production variable, followed by cereals (2.98 per cent). On the contrary, groundnut had negative growth rate (-3.17 per cent) in production variable, followed by jowar (-1.77 per cent).

Table X
Compound growth rates of principal crops in respect of area, yield, and production variables in India for two periods (Area in million hectares)

Year	Before Globalization (1981-1994)			After Globalization (1995-2010)		
	Area (in million hectares)	Yield (Kg/ha)	Production (in million tonnes)	Area (in hectares)	Yield (Kg/ha)	Production (in tonnes)
Rice	0.55	3.05	3.61	0.02	1.22	1.27
Wheat	0.64	2.89	3.54	0.4	0.59	0.99
Cereals	-0.33	3.25	2.91	-0.12	1.035	1.22
Foodgrains	-0.3	3.08	2.77	-0.07	1.25	1.18
Sugarcane	1.55	1.5	3.08	0.94	-0.45	0.62
Groundnut	1.28	1.26	2.54	-6.68	0.89	-0.8

Source: Ministry of Agriculture Government of India.

Table X gives information on compound growth rates of principal crops in respect of area, yield, and production variables in India for two periods. It is seen from the table VI that yield growth rates as well as production growth rates were at higher level in period-I compared to those of period-II. It was highest for cereals and food-grains and lowest for sugarcane and groundnut period -I. Marginal growth rates were seen in the area variables of all major crops in both the periods at all India level.

Table XI
Compound annual growth rates of area, yield of foodgrains in different Regions of Andhra Pradesh (per cent)

Periods	Coastal Andhra	Rayala-seema	Telan-gana	Andhra Pradesh
AREA (in lakh hectares)				
1973-74 to 1982-83	0.14	-2.68	-0.76	-0.77
1983-84 to 1990-91	-0.44	-7.18	-2.86	-2.43
1991-92 to 2000-01	0.39	0.23	0.35	0.36
2001-02 to 2010-11	0.38	1.53	1.12	1.13
1973-74 to 2010-11	0.07	-1.95	-0.88	-0.67
PRODUCTION (lakh tones)				
1973-74 to 1982-83	3.78	-1.12	3.22	2.86
1983-84 to 1990-91	0.33	-4.15	2.29	0.53
1991-92 to 2000-01	3.22	1.18	4.58	3.55
2001-02 to 2010-11	3.99	3.5	5.87	3.08
1973-74 to 2010-11	2.81	0.52	2.68	2.11
YIELD (kg/ha)				
1973-74 to 1982-83	3.63	1.6	4.01	3.66
1983-84 to 1990-91	0.77	3.26	5.3	3.04
1991-92 to 2000-01	2.83	0.95	4.21	3.19
2001-02 to 2010-11	3.59	1.94	4.84	1.93
1973-74 to 2010-11	2.74	2.52	3.59	2.73

Source : Estimated from Department of Economics and Statistics

Table VII provides information on compound annual growth rates of area, yield of foodgrains in different Regions of Andhra Pradesh in different period. Production growth rates and yield growth rates of foodgrains were at higher level in Telangan region followed by Costal Andhra regions compared to those growth rates of Rayalasema and Andhra Pradesh state as a whole.

Conclusions and Suggestions

By and large the higher growth rates of principal crops achieved in the Telangana region during the different time periods were due to favorable agro-climatic conditions, better irrigation facilities, adoption of recommended package of practices of crops, and various government policies and programmes introduced in the country. The Costal Andhra Region acquired second position in agricultural growth, followed by Rayalseema region. There is a large potential in all the regions of the State to increase yield and production growth rates of principal crops in the State as well as India. All the problems of the farmers such as getting remunerative prices for their agricultural products should be solved by taking appropriate policy, programmes and measures in the areas of production and marketing of crops and live-stock products. The Indian seed programmes for encouraging the development of new varieties of crops and protecting rights of farmers and plant breeders should be strengthened. The funds for agricultural research should be increased. Facilities for production and distribution of quality seeds at reasonable prices to the farmers should be ensured. The Integrated Nutrient Management Programme (INMP) should aim at sup-

plying the potassic and phosphatic fertilizers to the farmers at reasonable prices along with increased subsidy. Rainfed Area Development Programme (RADP) should help small and marginal farmers and improve farming systems in the country. The National Mission for Sustainable Agriculture (NMSA) should solve the problems and issues related to sustainable agriculture in context of risks (production risks and price risks) associated with the changes in the agro-climatic conditions and pollution hazards. The National Food Security Mission (NFSM) launched in the county to enhance the production of rice, wheat and pulses should be strengthened in the country as well as States.

REFERENCE

1. Census of India, Provisional Population Totals: Rural – Urban Distribution, (1991), Series-I, Paper-2, New Delhi, Government of India, pp.99-101. | 2. Final Population Totals 2001, Distribution of Census Operation, Andhra Pradesh. | 3. The Hand Book of Statistics, Chief Planning Officer, Chittoor District. p.1. | 4. Compendium of Area and Land Use Statistics of Andhra Pradesh (1955-56 to-2004-2005), Directorate of Economics and Statistics, Government of Andhra Pradesh. | 5. Ministry of Agriculture Government of India. The data were optioned from the websites, as well as statistical websites at distract level, Andhra Pradesh and all India level. | 6. Statistical abstracts of various issues. Ministry of Agriculture Government of Andhra Pradesh. | 7. Estimated from Department of Economics and Statistics of Government of India. |