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Dynamics Of Paddy Cultivation In South India

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Abstract:

South India comprises four states and union territories, namely Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu. In South India, paddy is a staple food crop that has been cultivated since ancient times. At present, paddy cultivation has claimed an unrivalled position and assumed the pride of place in the food grain crop scenario of southern India, relegating all other food crops to a position of poor secondary importance. In this significant process, paddy cultivation has undergone spectacular changes in the cultivation area, production, yielding crop areas under irrigation, etc. South Indian states dominate in area after West Bengal and Odisha states and in production after Punjab and Uttar Pradesh. The mechanisation and development of irrigation facilities and lift irrigation systems have greatly paved the way in South India for the abundant cultivation of paddy crops. Also, the researchers developing new breeds and high-yielding varieties have amply contributed to bringing more land under paddy cultivation.

Key words: Agri culture, Area Yield, Production, irrigation etc.

Introduction:

Paddy cultivation is a basic need and prime activity of South Indian farmers. The type of crop cultivation is a reflection of the food habits and the social and economic condition of the local population. Crop cultivation is the best index of the food habits of the people. The food habits, climatic conditions, particularly rainfall (irrigation facilities), temperature, and nature of soil found at a place are important determinants of crops. Crop typology is a complex and dynamic concept, which involves the grouping of various social, operational, production, and structural factors of agriculture and the changes that take place.

The awareness of the farmers about high-yielding varieties, (HYV) techniques in agricultural operations, and research on crop development brought a revolutionary change in the cultivation and dynamics of paddy cultivation. The recent research has brought a number of high-yielding varieties of paddy which are drought-resistant, pest-resistant, and short-run. However, the natural factors i.e., land and waterplay a pivotal role in growing paddy. Over a period of time, many technological evolutions have also taken place in the agricultural sector in India. Agriculture, once upon a time, was totally monsoon-dependent, and the production was at a quite lower ebb. During the period of study, it was brought on record that there is consistency in the paddy cultivation across the country, particularly in South India. The South Indian states Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, and Puducherry are good producers of paddy. Paddy in one form or another is greatly consumed by the local people of these states and is cultivated as a major source of food. The local state administrations have also given significant recognition to the cultivation of paddy. Further, in comparison to other crops, the soil in these states facilitate much for the cultivation of paddy.

In addition to the streams and rivulets, the perennial water sources from rivers such as Godavari, Krishna, Penna, Kaveri, and Tungabhadra meet the water requirements to a great extent, thereby creating a congenial atmosphere for the cultivation of paddy in these areas. The agriculturists are also scientifically and technically advanced, and they have the requisite awareness to ensure viability and high yield. The availability of labour at a cheaper rate and their hardworking nature also contribute to higher production, which provides economic sustainability to the state as the excess production is exported to other requiring areas.

Objectives:

The objectives of the study are

- (i) to examine the dynamics of paddy cultivation in area, yield, production of Study Area
- (ii) to compare the paddy cultivation dynamics of South India with those of India as a whole, as well as to study area
- (iii). To analyse the area under irrigation paddy cultivation in the study area.

Study Area:

The present study of South India (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, and Puducherry) is a major physical part of India also known as Peninsular India. The study area comprises 4 states and 97 districts. It occupies 19.31% of India's area (635,780 km² or 245,480 sq mi) and 20% of India's population. India comprises the diverse topological and climatic patterns of South India. South India is a peninsula in the shape of a vast inverted triangle, bounded on the west by the Arabian Sea, on the east by the Bay of Bengal, and on the north by the Vindhya and Satpura ranges. The line created by the Narmada and Mahanadi rivers is the traditional boundary between northern and southern India. Technically, all Indian territories below the 20th Parallel are included. Granite outcrops have created dramatic landscapes that became the focus of early Neolithic settlement in South India and also bear beautiful scenery. The major river systems in South India include the Godavari, Krishna, and Cauvery River systems. The rivers in South India flow eastwards because the Indian Peninsula slopes towards the east. The region has a tropical climate with the monsoons playing a major part. The southwest monsoon accounts for most of the rainfall in the region, and much of it occurs from about June to September. Tamil Nadu and southeast Andhra Pradesh receive rain from the northeast monsoon from about October to January. Much of Andhra Pradesh and Karnataka has a distinct dry season from November until May when there is not much rainfall. This region also experiences cooler nights from October to March while the days are pleasantly warm. In the northern parts of the region, temperatures can fall below 10 °C or 50 °F on occasion at night. Days are very hot from March to June when temperatures can surpass 40 °C or 104 °F. The major types of soil in South India include red soil, laterite soil, and alluvial soil. The natural vegetation in South India includes tropical evergreen forests, tropical deciduous forests, and mangrove forests and more. Out of the total population, still, 60-70 percent of the population is engaged in agricultural operations. The physical structure and nature of soils encourage the food habits of local people to incorporate paddy cultivation. The deltas like Krishna & Godavari, Cauvery, and Parma, Hidaka are favourable locations for paddy cultivation.

Data Base & Methodology:

The present statistical data from the Ministry of Agriculture, and Central statistical agency Govt. of India, is the primary and secondary source for obtaining information regarding the percentage of paddy cropped area in the total cultivated area, yield production and irrigation coverage. The entire dataset was collected over a period of 24 years, i.e., from 1990-91 to 2013-14. Percentages and averages are the primary statistical techniques like percentages, change, growth rates and graphical presentation used.

Paddy cultivation:

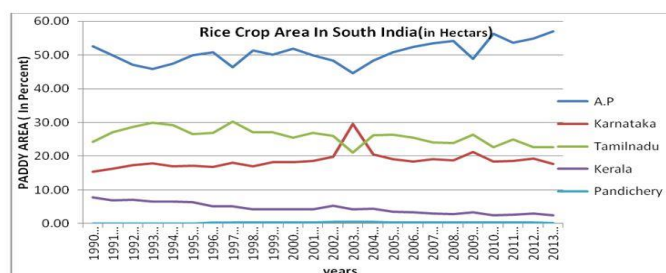
Topographically with a few exceptions much of South India is well-suited for paddy cultivation. As the region lies in a predominantly hot belt, paddy thrives in its climate. Rice is staple food which is rich in carbohydrates (about 17.5%), serves as the main source of energy for the population, contributing approximately 70–80% of daily energy requirements.

Although rice contains relatively low levels of protein, it supplies over 50% of the protein needs for individuals in this region. The quality of rice protein is fairly good, but it is deficient in the amino acid lysine, with lysine content averaging around 3.5%.

Despite this limitation, paddy remains a staple crop in South India, as it not only provides carbohydrates and proteins but also contributes essential lipids, vitamins, and minerals necessary for human nutrition. As a result, paddy has become a dominant and essential crop across the region.

The area under Paddy Crop:

The area under paddy cultivation increased from 14.5% (5,828.20 hectares) in 2002–03 to 19.67% (7,540.99 hectares) during the study period. By 2010–11, the total area under paddy cultivation rose to 8,429.90 hectares, compared to 5,828.20 hectares in 2002–03. At the national level, the average area under paddy cultivation increased from 41,176.1 thousand hectares in 2002–03 to 45,537.4 thousand hectares in 2008–09. During 2010–11, Andhra Pradesh recorded the highest area under paddy cultivation, with 4,751.0 hectares. In contrast, Pondicherry recorded the lowest area, with only 15.80 hectares under cultivation in 2013–14. The detailed data is shown in the following table- 1



Paddy Area, Yield and Production in south India																										
Area (in Hectors)																										
States / Years		1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	
Andhra Pradesh	Percent	52.66	50.05	47.16	45.84	47.46	50.04	50.77	46.37	51.37	50.16	51.88	49.99	48.42	44.68	48.34	50.94	52.39	53.56	54.24	48.96	56.36	53.61	54.86	57.02	
	Change	0	-2.61	-2.89	-1.31	1.62	2.58	0.74	-4.4	5	-1.21	1.72	-1.89	-1.56	-3.74	3.66	2.59	1.46	1.17	0.68	-5.28	7.4	-2.75	1.26	2.16	
	Growth	2.47	8.43	1.59	-2.57	-1.49	-11.29	14.82	-23.31	6.99	-5.7	9.86	26.21	-5.41	-3.73	-29.03	0.1	-0.15	-10.12	21.56	-38.07	13.79	11.43	-20.07	100	
Karnataka	Percent	15.31	16.13	17.23	17.76	16.9	17.15	16.79	17.93	16.97	18.12	18.14	18.53	19.81	29.65	20.49	19	18.37	19.04	18.72	21.16	18.27	18.53	19.33	17.57	
	Change	0	0.83	1.09	0.53	-0.85	0.24	-0.36	1.15	-0.96	1.15	0.02	0.39	1.28	9.83	9.16	-1.49	-0.62	0.66	-0.32	2.44	-2.89	0.26	0.79	-1.76	
	Growth rate	-8.15	-3.77	-4.34	5.68	2.36	-7.37	0.38	-5.35	-1.68	-2.32	4.42	18.55	-70.93	33.74	-13.53	6.06	-1.51	-6.92	1.78	-3.56	8.05	9.75	-5.01	100	
TamilNadu	Percent	24.21	26.93	28.58	29.84	29.07	26.43	26.86	30.22	27.08	27.04	25.43	26.92	26.02	20.98	26.21	26.23	25.44	24.05	23.89	26.26	22.61	24.92	22.58	22.59	
	Change	0	2.72	1.65	1.25	-0.76	-2.64	0.43	3.36	-3.14	-0.04	-1.6	1.49	-0.9	-5.04	5.23	0.02	-0.79	-1.38	-0.17	2.37	-3.65	2.31	-2.34	0.01	
	Growth rate	-14.13	-3.14	-5.67	3.46	12.47	-11.44	-4.92	0.25	4.89	3.86	0.96	26.38	7.89	-19.76	-22.58	5.81	7.36	-7.97	4.47	-3.26	0.1	21.57	-15.58	100	
Kerala	Percent	7.82	6.88	7.04	6.56	6.57	6.38	5.25	5.13	4.32	4.37	4.25	4.21	5.33	4.32	4.54	3.53	3.48	3.08	2.9	3.33	2.53	2.72	2.98	2.61	
	Change	0	-0.94	0.15	-0.47	0	-0.18	-1.14	-0.12	-0.81	0.05	-0.12	-0.04	1.11	-1.01	0.22	-1.01	-0.05	-0.4	-0.18	0.43	-0.8	0.2	0.26	-0.37	
	GrowthRate	9.69	0.67	5.54	0.91	6.4	9.83	8.87	6.33	3.56	0.63	7.22	3.69	7.44	-0.87	4.86	4.28	13.33	-2.4	0.13	8.89	2.35	5.24	-1.17	100	
pandi Cherry	Percent	0	0	0	0	0	0	0.33	0.35	0.26	0.32	0.31	0.34	0.41	0.38	0.42	0.31	0.32	0.27	0.26	0.3	0.24	0.22	0.25	0.21	
	Change	0	0	0	0	0	0	0.33	0.02	-0.09	0.06	-0.01	0.04	0.07	-0.04	0.04	-0.11	0.01	-0.05	-0.02	0.04	-0.06	-0.02	0.03	-0.04	
	Growth	0	0	0	0	0	0	1.13	16.35	-15.45	1.18	-4.78	8.37	4.15	-6.77	9.33	0	16.05	-1.96	-0.48	4.31	17	1.81	3.07	100	
South India	Percent	17.95	18.48	18.3	18.19	17.9	17.23	18.63	17.35	17.72	18.29	17.04	14.15	15.63	15.23	17.89	17.33	16.94	17.76	16.77	19.67	17.36	15.47	17.31		
	Change	0	0.53	-0.19	-0.11	-0.28	-0.68	1.41	-1.26	1.38	-1.03	0.57	-1.25	-2.88	1.48	-0.4	2.66	-0.56	-0.39	0.82	-0.99	2.9	-2.3	-1.9	1.84	
	GrowthRate	-2.61	2.81	-1.23	0.92	3.74	-9.67	6.74	-11.31	4.74	-2.2	6.45	23.83	-14.24	4.13	-22.47	2.88	2.03	-8.73	13.1	-19.94	9.36	13.45	-15.52	-	
Yield (in Kgs)																										
Andhra Pradesh	Yield	2392	2350	2439	2696	2550	2441	2601	2431	2752	2550	2936	2978	2596	3009	3111	2939	2984	3344	3246	3062	3035	3148	3173	2921	
	Change	0	42	-89	-257	146	109	-160	170	-321	202	-366	-42	382	-413	-102	172	-45	-360	98	184	27	-113	-25	252	
	Growth	0	1.76	-3.79	-10.54	5.42	4.27	-6.55	6.54	-13.2	7.34	-15.14	-1.43	12.83	-15.91	-3.39	5.53	-1.53	-12.06	2.93	5.67	0.88	-3.72	-0.79	7.94	
Karnataka	Yield	2059	2227	2331	2317	2445	2390	2364	2374	2563	2564	2593	2281	2070	2375	2712	3688	2470	2625	2511	2482	2719	2793	2532	2686	
	Change	0	-168	-104	14	-128	55	26	-10	-189	-1	-29	312	211	-305	-337	-1156	1398	-155	114	29	-237	-74	261	-134	
	Growth	0	-8.16	-4.67	0.6	-5.52	2.25	1.09	-0.42	-7.96	-0.04	-1.13	12.03	9.25	-14.73	-14.19	-42.63	36.14	-6.28	4.34	1.15	-9.55	-7.72	9.34	-5.29	
Tamilnadu	Yield	3116	3115	3116	2827	3394	2712	876	3050	3579	3481	3541	3196	2369	2808	2703	2546	3423	2917	2683	3070	3040	3918	2712	3100	
	Change	0	1	-1	189	-467	682	1836	-2174	-529	98	-40	345	837	51	-395	157	-877	506	234	-387	30	-878	1206	-388	
	Growth	0	0.03	-0.03	6.07	-15.95	20.09	67.7	-248.17	-17.34	2.74	-1.72	9.74	26.19	2.16	-17.11	5.81	-34.45	14.78	8.02	-14.42	0.98	-28.88	30.78	-14.31	
Kerala	Yield	1942	1959	2017	1977	1937	2023	1284	1448	4484	4640	4838	4541	4864	4182	4787	4972	4974	2310	2519	2557	2452	2733	2577	2551	
	Change	0	-17	-58	40	-40	-86	739	-2864	-336	-156	-198	297	-323	682	-605	-185	-2	2684	-209	-38	105	-281	156	26	
	Growth	0	-0.88	-2.96	1.98	2.02	-4.44	36.53	-223.05	-8.1	-3.48	-4.27	6.14	-7.11	14.02	-14.47	-3.86	-0.04	53.56	-9.05	-1.51	4.11	-11.46	5.71	1.01	
Pandicherry	Yield	2361	2500	2485	2094	2526	2494	2274	1958	2341	2538	2433	2544	2396	2559	2649	2365	2465	2618	2442	2534	2596	2538	2857	3147	
	Change	0	-139	15	391	-432	32	220	316	-383	-197	105	-111	148	-163	-90	284	-100	-153	176	-92	62	58	319	290	
	Growth	0	-5.89	0.6	15.73	-20.63	1.27	8.82	13.9	-19.56	-8.42	4.14	-4.56	5.82	-6.8	-3.52	10.72	-4.23	-6.21	6.72	-3.77	-2.45	2.23	-12.57	-10.15	
South India	Yield	2374	2430.2	2477.6	2402.2	2570.4	2412	1879.8	2792.2	3143.8	3154.6	3268.2	3108	2857	2886.6	3192.4	3338	3263.2	2762.8	2680.2	2741	2768.4	3026	2770.2	2877	
	Change	0	-56.2	-47.4	75.4	-168.2	158.4	532.2	-912.4	-351.6	-10.8	-113.6	180.2	251	-29.6	-305.8	-145.6	74.8	500.4	82.6	-60.8	-27.4	-257.6	255.8	-106.8	
	Growth	0	-2.37	-1.95	3.04	-7	6.16	22.06	-48.54	-12.59	-0.34	-3.6	4.9	8.08	-1.04	-10.59	-4.56	2.24	15.33	2.99	-2.27	-1	-9.31	8.45	-3.86	
Production (in Tonnes)																										
Andhra Pradesh	Production	9654	9249	8792	9562	9277	9014	10686	8510	11878	10638	12458	11390	7327	8853	9601	11704	11872	13324	14241	10538	14418	12895	11510	12725	
	Change	0	404.6	457.2	-770	285.3	262.5	-1672	2176	-3368	1240	-1820	1068	4063	-1626	-648	-2103	-168	-1452	-917	3703	-3880	1523	1385	-1215	
	Growth	0	4.19	4.94	-8.76	2.98	2.83	-18.55	20.36	-39.58	10.44	-17.11	8.57	35.67	-22.19	-7.24	-21.9	-1.44	-12.23	-6.88	26	-36.82	10.56	10.74	-10.55	
Karnataka	Production	2415.3	2826.1	3058.7	3182.8	3167.5	3023.9	3211.6	3212.7	3656.9	3718.7	3846.7	3234	2390.1	2550.3	3547	5744	3446	3717	3802	3691	4188	3955	3364	3572.6	
	Change	0	-411	-233	-124	15.3	144	-188	-1.1	-444	-61.8	-128	613	844	-160	-97	-2197	2298	-271	-85	111	-497	233	591	-209	
	Growth	0	-17.01	-8.23	-4.06	0.48	4.53	-6.21	-0.03	-13.83	-1.69	-3.44	15.93	26.09	-6.7	-39.08	61.94	40.01	-7.86	-2.29	2.92	-13.47	5.56	14.94	-6.2	
Tamilnadu	Production	5782.4	6596.3	6805.7	6749.8	7562.8	5290	1903.8	6893.7	8141.4	7532.1	7366.3	6584	3577.1	3222.8	5052.2	5220	6610.6	5040.2	5182.7	5665.2	5792.4	7458.7	4049.9	5349.8	
	Change	0	-814	-209	55.9	-813	2273	3386	-4990	-1248	609	166	782	3007	354	-1829	-168	-1391	1570	-143	-483	-127	-1666	3409	-1300	
	Growth	0	-14.08	-3.17	0.82	-12.04	30.05	64.01	-262.1	-18.1	7.48	2.2	10.62	45.67	9.9	-56.76	-3.32	-26.64	23.76	-2.83	-9.31	-2.25	-28.77	45.7	-32.1	
Kerala	Production	1086.6	1080.3	1084.8	1004	975.1	953	208.2	784.6	726.7	770.8	751.3	703.4	688.9	570	667	629.9	631	528.5	590.3	598.3	522.7	569	508.3	509.2	

Paddy Crop Production Trends:

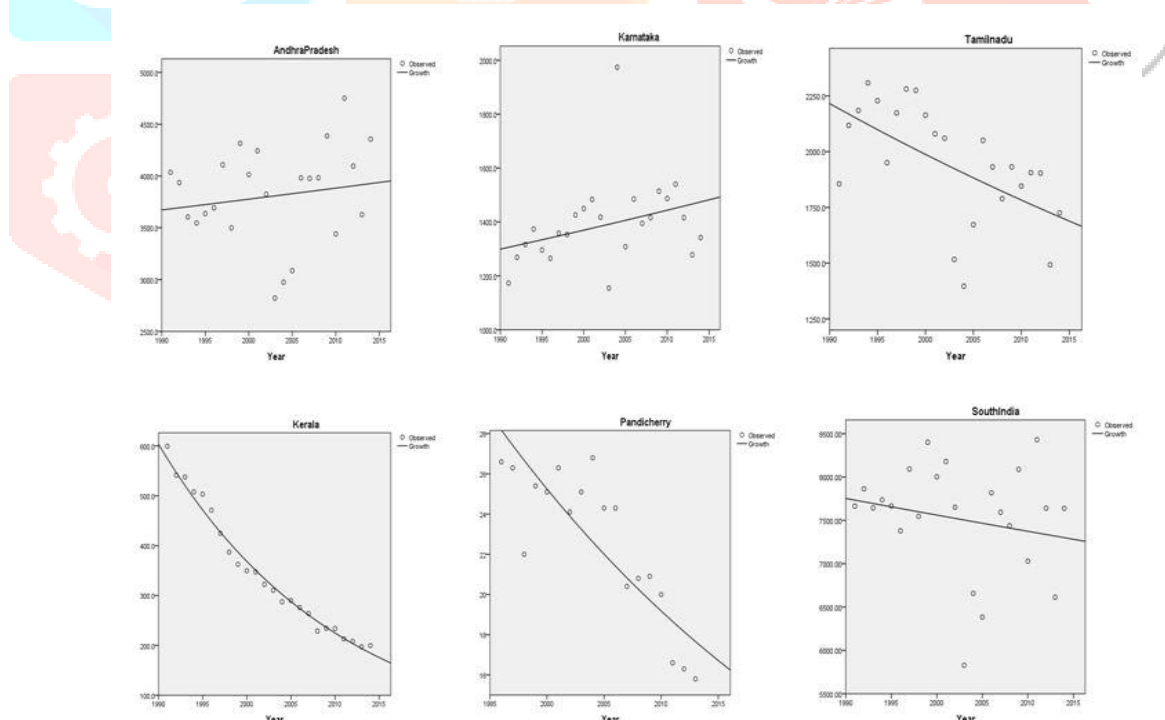
The lowest total paddy production for the South Indian region was recorded in **2003–04**, with an output of **14,040.60 tonnes**. These fluctuations suggest the influence of climatic variations, water availability, and policy-related factors affecting crop yield across the region.

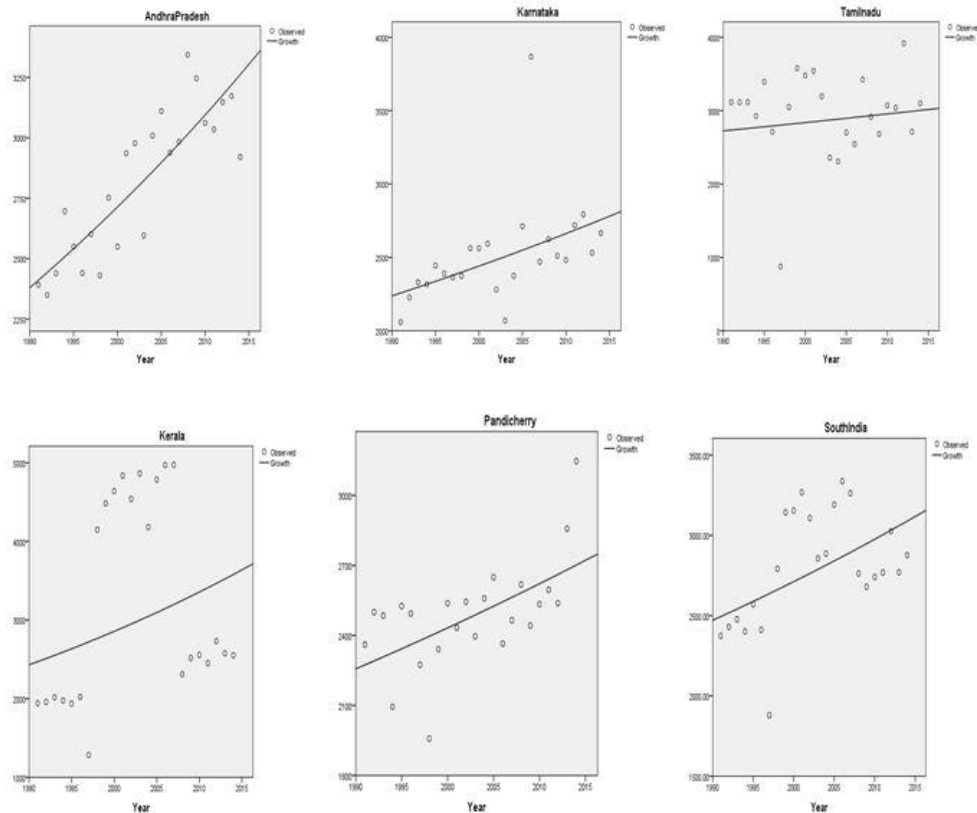
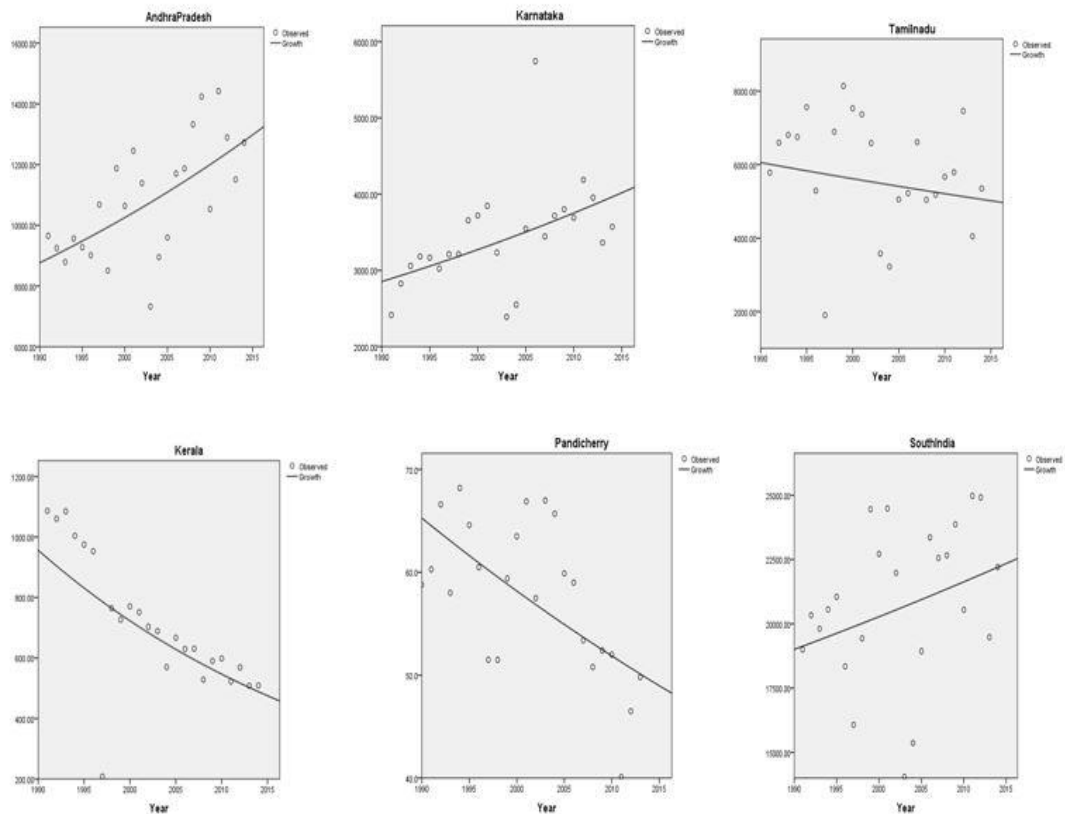
The Andhra Pradesh state recorded its highest paddy production of 14,418.00 tonnes during 2010–11, while the lowest production of 7,327.00 tonnes was observed in 2002–03. This sharp dip may be attributed to adverse weather conditions or changes in irrigation practices during the period. The Karnataka State Paddy production peaked at 5,744.00 tonnes in 2005–06, whereas the lowest output of 2,390.10 tonnes was reported in 2002–03. The low production year aligns with the regional trend of reduced output in 2002–03. The Tamil Nadu state achieved its highest paddy production of 8,141.40 tonnes in 1998–99, while the lowest production, 1,903.80 tonnes, was recorded in 1996–97. This indicates significant intra-decade variability in production, possibly influenced by monsoon performance or agricultural policies. The highest production in Kerala was 1,086.80 tonnes in 1990–91, which steadily declined to a low of 208.20 tonnes in 1996–97. This downward trend reflects a long-term decline in paddy cultivation in the state, likely due to urbanization and a shift to other crops. The union territory of Puducherry recorded its highest production of 68.20 tonnes in 1994–95, and the lowest of 40.10 tonnes in 2011–12. Although production figures are relatively small, they show a similar declining trend as seen in other parts of South India.

National Comparison:

At the national level, India recorded its highest paddy production of **106,645.50 tonnes** during **1997–98**, whereas the lowest was **55,689.50 tonnes** in **1999–2000**. This national pattern highlights that some of the regional fluctuations in South India mirror broader national agricultural trends.

Paddy Area in South India (in Hectares):



Paddy Yield Levels in South India (in kgs):**Production in South Indian States (in Tonnes):**

Irrigation Coverage in Paddy Cultivation – South India Analysis **Percentage Coverage under irrigation:**

In South India, paddy cultivation largely depends on irrigation due to the crop's need for a continuous supply of water. As a result, irrigation facilities are essential for successful paddy farming in the region.

In South India entire Paddy cultivation is under irrigation because Paddy requires of continuous supply of water hence irrigation facilities are compulsory for paddy cultivation. During the study period it is observed that Pondicherry, union territory is having high percentage coverage (100%) Under Irrigation but in Karnataka recorded the lowest Percentage (34.25 %) Under Irrigation.

Percentage of Irrigated area under Paddy Cultivation In south India									
S.no	Year	Andhra Pradesh	Karnataka	Tamilnadu	Kerala	Pandicherry	Average	South India	India
1	1990	94.90	61.03	90.86	37.37	100.00	84.56	84.56	45.61
2	1991	94.92	64.00	92.45	42.31	100.00	85.96	85.96	47.42
3	1992	94.48	64.94	92.29	39.43	100.00	85.24	85.24	48.11
4	1993	94.99	66.39	92.58	41.35	100.00	86.02	86.02	48.77
5	1994	94.69	66.99	92.62	54.24	100.00	87.10	87.10	49.96
6	1995	94.80	66.79	92.02	49.88	100.00	86.75	86.75	50.12
7	1996	95.60	67.28	92.70	55.32	97.74	87.96	87.96	53.58
8	1997	96.37	68.72	92.39	52.18	97.74	87.95	87.95	53.38
9	1998	95.95	70.35	93.54	54.33	95.06	89.15	89.15	55.20
10	1999	95.69	71.39	93.18	59.77	98.43	89.04	89.04	55.45
11	2000	95.24	72.06	93.13	59.86	99.62	89.01	89.01	54.43
12	2001	95.72	69.97	93.25	57.07	98.86	88.66	88.66	54.28
13	2002	95.28	63.13	90.67	58.62	99.59	85.77	85.77	51.36
14	2003	94.29	34.25	90.35	59.15	99.60	74.16	74.16	52.52
15	2004	95.20	70.57	92.48	63.47	93.28	88.13	88.13	56.19
16	2005	96.56	75.42	93.00	58.01	94.65	90.25	90.25	57.13
17	2006	96.43	73.05	90.92	65.53	90.53	89.64	89.64	57.65
18	2007	96.64	72.95	92.72	67.31	98.04	90.29	90.29	57.43
19	2008	96.85	74.04	93.28	72.13	100.00	91.02	91.02	58.38
20	2009	97.47	74.78	92.77	72.22	100.00	90.60	90.60	57.74
21	2010	97.16	76.62	93.19	70.36	100.00	91.84	91.84	59.46
22	2011	97.09	74.86	93.76	99.90	100.00	92.23	92.23	58.13
23	2012	96.80	71.91	92.16	74.51	98.16	90.28	90.28	58.46
24	2013	57.71	75.04	93.41	77.15	100.00	69.42	69.42	60.08
	Minimum	57.71	34.25	90.35	37.37	90.53	69.42	69.42	45.61
	Maximum	97.47	76.62	93.76	99.90	100.00	92.23	92.23	60.08
	Average	60.66	72.30	86.48	43.67	98.86	86.64	68.83	61.34

Average Percentage highest in Pondicherry (98.86%) Tamilnadu (86.48%) Karnataka (72.30%) Andhra Pradesh (50.55 %) Kerala (43.67%) under irrigation respectively. Year wise highest (100% percentage of irrigation is noticed in 1990- 91 to 1994-95 and 2007-08 to 2010-11 and 2013 and the lowest percentage in 90.53 percent of irrigation during 2005-06 in Pondicherry (Union Territory). During the study period state wise highest irrigation in Kerala (99.90%) percent Noticed 2010-11 lowest recorded (37.37%) percent recorded during 1990-91 following state highest in Andhra Pradesh (97.47%) percent during 2008-09 and the lowest in 57.71 percent noticed during 2012-13, Tamilnadu93.76 percent in during 2010-11 and lowest in 76.62 percent recorded during 2009-10 and lowest 34.25 percent during 2002-03 under irrigation. Total paddy cropped area covered in concerned states of the country respectively.

In the years the lowest 34.25 percent recorded in Karnataka followed by Kerala Andhra Pradesh and Tamilnadu recorded is noticed. In Tamilnadu state on average, 86.48 percent followed by Karnataka, Andhra Pradesh and Kerala percentage area under paddy crop is noticed above-average Tamilnadu and Karnataka below average, Andhra Pradesh and Kerala of average of South India. This percentage is high with compare to the national level (61.34 %). The detailed data is shown given below table- 2

Results and Discussions:

The analysis reveals a significant increase in the area under paddy cultivation both at the study region level and nationally. In the study area, the paddy cultivation area expanded from 5,828.20 hectares (14.5%) in 2002–03 to 7,540.99 hectares (19.67%) during the study. By 2010–11, this number further rose to 8,429.90 hectares, indicating a steady upward trend in local paddy farming activities.

At the national level, the average area under paddy cultivation increased from 41,176.1 thousand hectares in 2002–03 to 45,537.4 thousand hectares in 2008–09, reflecting a broader national trend of increased focus on paddy cultivation.

Among Indian states, Andhra Pradesh reported the highest area under paddy cultivation in 2010–11, with 4,751.0 hectares, underscoring its role as a major rice-producing state. In contrast, Pondicherry recorded the lowest area under cultivation in 2013–14, with 15.80 hectares, highlighting regional disparities in paddy farming across the country.

These trends suggest a combination of favorable policy interventions, improved irrigation infrastructure, and increasing demand for rice as contributing factors to the growth in paddy cultivation. However, the regional disparities also call for targeted support and development strategies in low-performing areas to ensure balanced agricultural growth.

An overall high-yielding trend is evident in the crop production data, though notable year-to-year fluctuations are observed. The highest yield per hectare was recorded in Kerala during 2006–07, at 4,974 kgs/ha, while the lowest yield occurred in Tamil Nadu during 1996–97, with only 876 kgs/ha.

On average, Tamil Nadu demonstrates a consistently high-yielding trend, attributed to factors such as high fertilization rates and greater mechanization. In contrast, Karnataka shows relatively lower average yields. Among the major states, Andhra Pradesh followed Tamil Nadu in yield performance and ranks second in area under cultivation, after West Bengal.

Importantly, the average yield across the five major states consistently exceeds the national average across all years of observation. This is largely due to the crop's status as a staple food and the intensive cultivation practices prevalent in these regions.

At the state level, the highest average yield of 3,338 kgs/ha was recorded in 2006–07, while the lowest, at 1,879.80 kgs/ha, occurred in 1996–97. Nationally, the average yield peaked at 2,461 kgs/ha in 2012–13 and reached its lowest point of 1,740 kgs/ha in 1990–91.

The paddy crop production in South India exhibited significant inter-annual fluctuations between 1990–91 and 2013–14. While the area under cultivation remained relatively stable throughout most of the period, production levels varied considerably across different states and years.

Conclusion:

Paddy is the predominant crop cultivated to meet the consumption needs of South Indian states. Over the years, significant changes have been observed in its cultivation, including fluctuations in the area under cultivation, production levels, yield, and the extent of irrigated crop areas.

The data indicates a consistent and significant increase in the area under paddy cultivation both at the local and national levels over the study period. Locally, paddy cultivation expanded from 14.5% (5,828.20 hectares) in 2002–03 to 19.67% (7,540.99 hectares), reaching 8,429.90 hectares by 2010–11. Nationally, the area under paddy cultivation also showed growth, rising from 41,176.1 thousand hectares in 2002–03 to 45,537.4 thousand hectares by 2008–09. Among states, Andhra Pradesh recorded the highest area under

cultivation in 2010–11, while Pondicherry reported the lowest in 2013–14. This overall growth reflects increased emphasis on rice production, likely driven by rising food demand and agricultural development initiatives.

Among the South Indian states, Kerala recorded the highest yield during 2005–06, while Tamil Nadu recorded the lowest in 1995–96. Throughout the study period, Kerala consistently ranked first in terms of average yield, followed by Karnataka and Puducherry. Kerala, Tamil Nadu, and Andhra Pradesh had yields above the national average, whereas Karnataka and Puducherry remained below it. Looking at year-wise yield performance, the highest yield was recorded in 2012–13, and the lowest in 1990–91.

Paddy crop production in South India showed significant fluctuations between 1990–91 and 2013–14. While the area under cultivation remained relatively stable, production varied notably across the years. The lowest regional output was recorded in 2003–04 at 14,040.60 tonnes.

Andhra Pradesh saw its highest production of 14,418.00 tonnes in 2010–11, and the lowest, 7,327 tonnes, in 2002–03. Karnataka recorded its highest production at 5,744.00 tonnes in 2005–06 and the lowest at 2,390.10 tonnes in 2002–03. Tamil Nadu reached its peak in 1998–99 with 8,141.40 tonnes, while the lowest was 1,903.80 tonnes in 1996–97. Kerala had the highest production of 1,086.80 tonnes in 1990–91, and the lowest at 208.20 tonnes in 1996–97. Pondicherry recorded its highest output of 68.20 tonnes in 1994–95 and the lowest, 40.10 tonnes, in 2011–12. At the national level, India recorded the highest paddy production of 106,645.50 tonnes in 1997–98, while the lowest was 55,689.50 tonnes in 1999–2000.

Overall, while the area under paddy cultivation in South India remained largely unchanged, production showed notable variability across the years and among states. The year 2002–03 appears to be a particularly poor year for paddy production across multiple states, indicating possibly widespread climatic or environmental stress. These findings emphasize the need for resilient agricultural practices, improved irrigation systems, and region-specific strategies to stabilize paddy production in South India.

In terms of irrigation, Puducherry and Tamil Nadu had the highest average percentages of irrigated paddy area, at 98.86% and 86.48% respectively. Kerala had the lowest average, at 43.67%. The year 2011–12 saw the highest irrigation coverage at 92.23%, while 2013–14 recorded the lowest at 69.42%. Across all the years studied, Puducherry, Tamil Nadu, Karnataka, and Andhra Pradesh consistently recorded irrigation coverage above the national average, while Kerala remained below.

Technological Evolution and Support in Paddy Cultivation:

The evolution of agricultural technology has played a crucial role in enhancing paddy production in South India. Key advancements include the development of high-yielding variety (HYV) seeds, timely application of fertilizers and pesticides, the use of green manures, improved irrigation facilities, and increased mechanization. Ensuring these technologies are easily accessible to small and marginal farmers remains a priority.

Systematic mechanization of the agricultural sector, combined with ongoing research to develop drought- and pest-resistant high-yield seed varieties, has significantly improved crop resilience and productivity. Optimal utilization of water resources and the dissemination of agro-technical knowledge have equipped small and medium farmers with up-to-date practices, enabling effective field application.

Furthermore, the state government provides financial support to needy farmers to sustain their agricultural activities. A robust technical and administrative support system is also in place to assist farmers during natural calamities. These comprehensive efforts have established paddy as a major staple food source in South India.

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