

Changing Status of Common Property Resources (CPRs) in Dindigul District of Tamil Nadu: Evidence from Secondary Data

Kannan. A¹, S. Levin Sarath²

¹Assistant Professor, Department of Environmental Economics, Madurai Kamaraj University

Abstract:

The present study examines the changing status of Common Property Resources (CPRs) in Dindigul District of Tamil Nadu using secondary data collected from the District Statistical Handbook for the period 1994 to 2025. This paper is a part of the outcome of the major research project funded by the Chief Minister's Research Grant (CMRG) scheme instituted by the Government of Tamil Nadu. The study analyses major land use categories and the changing relationship between Common Property Resources (CPRs) and Private Property Resources (PPRs). Statistical tools such as descriptive statistics, correlation, and regression analysis were used to understand the trends and variations in land utilization. The findings show noticeable changes in land use patterns over the study period. While forest area remained stable, net area sown gradually declined due to urbanization, land conversion, and environmental pressure. CPRs showed a steady increase, whereas PPRs recorded a decline. The regression analysis confirms that the growth of CPRs over time is statistically significant. The study concludes that changes in land use and resource management have significantly influenced the structure of rural resources in Dindigul District. It emphasizes the need for sustainable management and conservation of common property resources to ensure environmental stability and rural livelihood security.

Keywords: Common Property Resources, Land Use Change, Rural Development, Environmental Sustainability, Land Management

INTRODUCTION:

Common Property Resources (CPRs) have long been recognized as a critical component of rural socio-ecological systems, particularly in agrarian economies where livelihoods are closely intertwined with natural resource endowments. CPRs broadly refer to resources such as community pastures, grazing lands, village forests, water bodies, fisheries, and other shared natural assets to which a defined community has collective access and use rights, though not necessarily ownership in the conventional private property sense. These resources play a pivotal role in sustaining ecological balance, supporting

¹ Dr. A. Kannan, Principal Investigator in CMRG Project & Assistant Professor, Department of Environmental Economics, School of Economics, Madurai Kamaraj University, Madurai – 21, Tamil Nadu

² Project Assistant, CMRG Project, Department of Environmental Economics, School of Economics, Madurai Kamaraj University, Madurai – 21, Tamil Nadu

subsistence needs, and providing livelihood security to marginal and landless households. Globally, however, CPR systems have undergone significant transformation due to increasing population pressure, commercialization of land, privatization of common lands, and weakening of traditional institutions governing collective resource use. Such changes have led to widespread concerns regarding resource degradation, inequitable access, and institutional breakdown in CPR governance systems (Berkes, 2006; Baland & Platteau, 1996).

The theoretical understanding of CPRs has been substantially enriched by the works of several scholars who have challenged the earlier “tragedy of the commons” narrative. Elinor Ostrom’s seminal work demonstrated that communities are capable of self-organizing and sustainably managing common resources through well-defined rules, collective-choice arrangements, and locally embedded institutions (Ostrom, 1990). Her institutional analysis framework emphasized that CPR outcomes are shaped not merely by resource characteristics but by governance structures and social capital within user communities. Similarly, Jodha (1986) provided pioneering empirical evidence from semi-arid India showing that CPRs significantly contribute to rural household incomes, particularly among the poor, by acting as a buffer during periods of agrarian distress. Building on this, scholars such as Bardhan and Ray have highlighted the role of inequality, power structures, and collective action problems in determining CPR access and sustainability. Agarwal (2001) further expanded this discourse by integrating gender dimensions into CPR governance, demonstrating that women’s dependence on commons is often high, yet their participation in decision-making institutions remains limited. These theoretical perspectives collectively underline that CPRs are not merely environmental assets, but socially embedded institutions shaped by complex interactions between ecology, economy, and governance.

In the Indian context, CPRs have historically formed the backbone of rural subsistence economies. A significant proportion of the rural population, especially landless laborers, small and marginal farmers, and pastoral communities, depend on CPRs for fuelwood, fodder, water, and minor forest products. Jodha’s (1986) influential study revealed that CPRs contribute substantially to household income in arid and semi-arid regions, sometimes accounting for as much as 20–40 percent of total income for poorer households. Despite their importance, CPRs in India have been under severe stress due to rapid land-use change, agricultural intensification, expansion of private landholdings, industrialization, and infrastructural development. Encroachment of common lands, fragmentation of grazing areas, and degradation of village forests have further reduced the availability and productivity of these resources. In addition, population growth and rising demand for land have intensified competition over CPRs, often leading to conflicts and institutional weakening. Scholars such as Chopra and Gulati (2001) and Meinzen-Dick and Knox (1999) have emphasized that policy neglect and inadequate institutional reforms have further exacerbated the decline of CPR systems in rural India.

In Tamil Nadu, the transformation of CPRs reflects broader patterns of agrarian change and economic development. The state has witnessed rapid urbanization, industrial expansion, and diversification of its rural economy, all of which have significantly altered traditional land-use systems. Common grazing lands and village tanks, which once formed an integral part of rural life, have increasingly been subjected to encroachment, conversion to agricultural or residential uses, and degradation due to neglect of maintenance systems. Studies on South Indian commons have shown that Tamil Nadu has experienced a steady decline in per capita availability of CPRs, largely driven by demographic pressure and institutional erosion. The shift towards high-input agriculture and groundwater dependence has also reduced the functional importance of surface commons such as tanks and grazing lands. Consequently,

environmental stress, including declining soil quality, reduced biodiversity, and water scarcity, has become more pronounced in several districts of the state (Agarwal, 2001; Wade, 1988).

Dindigul District, located in the southern part of Tamil Nadu, presents a particularly relevant case for examining the changing status of CPRs. The district is characterized by a diverse agro-climatic structure, ranging from semi-arid plains to hilly terrains, and has historically relied on a combination of agriculture, livestock rearing, and allied activities. Rural households in Dindigul have traditionally depended on CPRs such as grazing lands, forest fringes, and water bodies for sustaining livestock and meeting subsistence needs. However, over the past few decades, the district has undergone significant socio-economic and land-use transformations. Expansion of irrigated agriculture, industrial development, urban sprawl, and infrastructure projects have contributed to the gradual reduction of common lands. At the same time, changes in cropping patterns and increased reliance on private inputs have weakened the functional dependence on CPRs. These dynamics suggest a structural shift in the rural resource base, with important implications for livelihood sustainability and environmental resilience.

Despite the acknowledged importance of CPRs in rural development discourse, there remains a notable research gap in district-level empirical studies that systematically examine their temporal transformation using secondary data. While national and regional studies provide broad insights into CPR decline, they often fail to capture localized variations and micro-level dynamics that are crucial for policy formulation. In the case of Dindigul District, there is limited longitudinal analysis that integrates land-use data over extended time periods to assess the changing status of CPRs in a structured and empirical manner. Furthermore, existing studies have largely focused on qualitative assessments or cross-sectional analyses, with insufficient attention to quantitative trends derived from secondary datasets such as land records and satellite-based classifications. This gap necessitates a more rigorous time-series analysis to understand how CPRs have evolved over time and what factors have driven these changes.

The importance of this study lies in its potential contribution to both academic literature and policy formulation. From an academic perspective, the study adds to the growing body of CPR research by providing district-level empirical evidence on resource transformation in a rapidly changing agrarian context. It also strengthens the methodological approach of using secondary data for longitudinal analysis of land-use change, thereby enhancing the robustness of CPR studies. From a policy standpoint, understanding the changing status of CPRs is crucial for designing sustainable rural development strategies, particularly in regions where marginal communities continue to depend on common resources for their livelihoods. The findings of this study are expected to inform land management policies, conservation strategies, and institutional reforms aimed at revitalizing CPR systems. Moreover, in the context of increasing environmental challenges such as climate variability, land degradation, and resource scarcity, the sustainable management of CPRs assumes even greater significance for ensuring ecological balance and livelihood security.

The main objective of the Paper is to examine the changing status of Common Property Resources (CPRs) in Dindigul District of Tamil Nadu using secondary data. Specifically, the study aims to analyse the temporal changes in CPRs over time, understand the impact of land-use transformations on CPR availability, and identify the major factors associated with the decline or alteration of CPRs in the study area. In addition, the study seeks to highlight the implications of CPR changes for rural livelihoods and environmental sustainability, and to suggest suitable policy measures for the sustainable management and conservation of Common Property Resources in Dindigul District.

METHODS AND MATERIALS

The present study examines the changing pattern of land use and the relationship between Common Property Resources (CPRs) and Private Property Resources (PPRs) in Dindigul District, Tamil Nadu. The analysis is entirely based on secondary data compiled from various issues of the *District Statistical Handbook of Dindigul*, published by the Department of Economics and Statistics, Government of Tamil Nadu. The study period covers three decades, from 1994 to 2025, enabling a long-term assessment of structural changes in land utilization.

The land use variables considered include Forest, Barren and Uncultivable Land, Land Not Available for Cultivation, Cultivable Waste, Permanent Pasture, Miscellaneous Tree Crops, Current Fallow, Other Fallow, and Net Area Sown. These components were further grouped to represent broader categories of CPRs and PPRs for analytical purposes. The geographical area of the district was treated as a constant reference base for percentage conversion and comparative analysis.

For statistical analysis, simple descriptive statistics such as mean and standard deviation were used to understand the central tendency and dispersion of CPRs and PPRs over time. In addition, time-series trends were examined to identify directional changes in land use components. Pearson's correlation coefficient was applied to measure the strength and direction of association between CPRs and PPRs. A simple linear regression model was employed to assess the impact of time (Year) on the growth pattern of CPRs, with significance tested at 1 percent and 5 percent levels.

All data were tabulated, processed, and interpreted using standard statistical techniques to ensure clarity and comparability. The study adopts a quantitative research design with an explanatory approach, focusing on identifying structural shifts in land distribution and resource use over time. The results are presented in a systematic manner to support meaningful interpretation of land use transformation in the district.

EVIDENCE FROM EARLIER STUDIES

Common Property Resources (CPRs) have long been recognized as an essential component of rural livelihood systems in developing countries, particularly in India. These resources, including forests, grazing lands, and other village commons, play a significant role in supporting the income, subsistence needs, and employment security of rural households. Over the years, a considerable number of empirical studies have examined the extent of dependence on CPRs among landless labourers, marginal farmers, and forest-dependent communities. The following section reviews selected earlier studies that highlight the contribution of CPRs to rural income and livelihood sustainability.

Jodha (1986) in his seminal study across semi-arid regions of Rajasthan and Gujarat found that CPRs contributed nearly 9 to 23 per cent of household income in drought-prone villages, with a higher share among poorer households. The study emphasized that CPRs act as a critical coping mechanism during agricultural uncertainty. It further established that common resources significantly reduce vulnerability in fragile ecological regions.

Beck and Nesmith (2001) examined forest-dependent communities in eastern India and reported that CPR-based resources contributed approximately 12 per cent of total household income among marginal farmers, while landless households derived an even higher dependence of about 18 per cent. Their findings revealed that minor forest products and grazing resources formed the backbone of subsistence support systems. The study also indicated that CPR dependence increases during lean agricultural seasons. This demonstrates the seasonal importance of commons in rural livelihood security.

Sunderlin et al. (2005), analyzing forest dependence in developing regions including India, reported that forest-based CPRs contributed around 10–20 per cent of household income for rural poor communities. The study found that dependence was significantly higher among landless and forest-adjacent households compared to better-off groups. It emphasized that CPRs function not only as income sources but also as safety nets during economic shocks. The findings underline the persistent relevance of commons in poverty alleviation and rural livelihood sustainability.

Behera and Pati (2010), in their study of tribal villages in Odisha, observed that CPRs accounted for nearly 15–25 per cent of total household income, particularly through fuelwood, fodder collection, and non-timber forest products. The research highlighted that women played a dominant role in CPR collection activities, linking commons directly with household survival strategies. It further noted that income from CPRs helped smooth consumption needs during agricultural shortfalls. The study clearly establishes CPRs as an integral component of tribal rural economies.

RESULTS AND DISCUSSION

The results and discussion section presents a detailed analysis of land use changes and resource patterns in Dindigul District over the study period. It highlights key trends in CPRs and PPRs and explains their implications using statistical evidence and interpretation.

Table 1: Land Use Pattern in Dindigul District from 1994 to 2025

Year	Forest	BUL	LNA	CW	PP	Mis	CF	OF	NAS	Geo
1994	138923 (22.17)	36210 (5.78)	61808 (9.86)	7567 (1.21)	6928 (1.11)	10947 (1.75)	34038 (5.43)	57336 (9.15)	273107 (43.58)	626664
2000	138923 (22.17)	36210 (5.78)	64957 (10.37)	8521 (1.36)	6916 (1.10)	7130 (1.14)	61932 (9.88)	67569 (10.78)	234506 (37.42)	626664
2010	138923 (22.17)	36210 (5.78)	66179 (10.56)	5842 (0.93)	6946 (1.11)	7592 (1.21)	33301 (5.31)	111579 (17.81)	220092 (35.12)	626664
2020	138923 (22.17)	36210 (5.78)	67306 (10.74)	5513 (0.88)	6946 (1.11)	7712 (1.23)	13075 (2.09)	135517 (21.63)	215462 (34.38)	626664
2025	138923 (22.17)	36210 (5.78)	67381 (10.75)	8216 (1.31)	6946 (1.11)	6914 (1.10)	15270 (2.44)	130496 (20.82)	216306 (34.52)	626664

Sources: Department of Economics and Statistics, Dindigul District Statistical Handbook in various issues upto 2024-2025

The land use pattern in Dindigul District between 1994 and 2025 in Table 1 reflects significant structural changes in agricultural and non-agricultural land utilization. Forest area remained almost unchanged throughout the study period at 138,923 hectares, constituting 22.17 percent of the total geographical area. Similarly, Barren and Uncultivable Land also remained stable at 36,210 hectares (5.78%), indicating limited scope for reclaiming such lands for productive purposes. The geographical area of the district remained constant at 626,664 hectares during the entire period. Land Not Available for Cultivation gradually increased from 61,808 hectares (9.86%) in 1994 to 67,381 hectares (10.75%) in 2025. This increase may be associated with rapid urbanization, infrastructural development, population growth, and the conversion of agricultural land for residential and commercial activities. Cultivable

Waste land fluctuated moderately, rising from 1.21 percent in 1994 to 1.31 percent in 2025, indicating the persistence of degraded or underutilized land resources.

Permanent Pasture remained nearly stagnant around 1.10–1.11 percent, reflecting limited grazing resources and increasing pressure on common lands. Miscellaneous tree crops and groves also recorded only marginal variations during the study period. Current Fallow land exhibited considerable fluctuations, increasing sharply from 5.43 percent in 1994 to 9.88 percent in 2000, before declining to 2.44 percent in 2025. Such variations may be linked to irregular rainfall, inadequate irrigation facilities, climate variability, and temporary abandonment of cultivation. In contrast, Other Fallow land increased substantially from 9.15 percent in 1994 to 20.82 percent in 2025, highlighting the growing tendency of agricultural lands remaining uncultivated for longer durations due to declining soil fertility, labour shortages, rising cultivation costs, and reduced profitability in farming. Net Area Sown experienced a continuous decline from 43.58 percent in 1994 to 34.52 percent in 2025. This reduction reflects the shrinking extent of active agricultural land caused by urban expansion, land degradation, water scarcity, and changing occupational patterns away from agriculture. Overall, the land use transition in Dindigul District indicates increasing pressure on agricultural resources and a gradual shift toward non-agricultural land utilization.

Table 2: CPRs and PPRs in Dindigul District

Year	CPRs	PPRs
1994	246964 (39.41)	379900 (60.62)
2000	258139 (41.19)	368525 (58.81)
2010	299500 (47.79)	327164 (52.21)
2020	323109 (51.56)	303555 (48.44)
2025	320791 (51.19)	305871 (48.81)

Sources: Department of Economics and Statistics, Dindigul District Statistical Handbook in various issues upto 2024-2025

CPRs in Dindigul District in showed in Table 2 recorded a steady increase from 39.41 percent in 1994 to 51.19 percent in 2025, while PPRs declined from 60.62 percent to 48.81 percent during the same period. The share of CPRs gradually rose from 41.19 percent in 2000 to 47.79 percent in 2010 and crossed 50 percent by 2020, indicating the growing importance of common property resources in the district. In contrast, PPRs showed a continuous downward trend, reflecting the reduction in privately controlled land resources. These changes may be linked to shifts in land use patterns, population pressure, environmental changes, and agricultural development activities. Expansion of community-managed lands, conservation initiatives, and government policies related to land management could have supported the growth of CPRs. At the same time, privatization of land, urban expansion, and fragmentation of agricultural holdings may have contributed to the decline in PPRs. The overall trend

highlights a gradual transformation in land ownership and resource utilization patterns in Dindigul District.

Table 3: Model Summary and ANOVA Results of Regression Analysis

Model	R	R Square	Adjusted R Square	F	Sig.
1	.975	.951	.935	58.733	.005

Note: Dependent Variable – Total CPRs.

Table 4: Regression Coefficient of Year on Total CPRs.

Variables	B	Std. Error	Beta	t	Sig.
Constant	-5023639.071	693318.451	-	-7.246	.005
Year	2643.716	344.963	.975	7.664	.005

Note: Dependent Variable- Total CPRs

The linear regression results in Table 3 indicate a very strong and statistically significant relationship between Year and Total CPRs. The model exhibits a high correlation coefficient ($R = 0.975$), suggesting a near-perfect positive linear association. The coefficient of determination ($R^2 = 0.951$) shows that 95.1% of the variation in Total CPRs is explained by Year, while the Adjusted R^2 value of 0.935 confirms the model's stability and strong explanatory power after adjustment for degrees of freedom. The ANOVA results shoes in Table 4 further validate the model, with an F-value of 58.733 and a significance level of 0.005, indicating that the regression model is statistically significant at the 1% level. This confirms that Year is a meaningful predictor of Total CPRs. The coefficient estimates reveal a positive and significant relationship between Year and Total CPRs. The unstandardized coefficient ($B = 2643.716$) implies that Total CPRs increase by approximately 2,644 units for every one-year increase. The standardized beta value ($\beta = 0.975$) reflects a very strong positive influence of Year on CPRs. The t-value (7.664) and p-value (0.005) confirm that this relationship is highly statistically significant.

Table 5: Correlation between Total CPRs and Total PPRs

Variables	Total CPRs	Total PPRs
CPRs	1	-1.000
PPRs	-1.000	1

Note: $p < 0.01$ level (2- tailed), $N = 5$

The correlation analysis clearly in Table 5 indicates that there is a perfect negative relationship between Total CPRs and Total PPRs. The Pearson correlation coefficient value of -1.000 shows that both variables move in opposite directions. This means that when CPRs increase, PPRs decrease correspondingly, and when PPRs increase, CPRs decline. The significance value ($p = .000$) is less than the 0.01 level, which confirms that the relationship between the two variables is statistically significant. Therefore, the association observed in the analysis is not due to random variation. The findings reveal that changes in common property resources are strongly associated with changes in private property resources in the study area. The inverse relationship suggests that the expansion of one category directly influences the reduction of the other over the observed period.

Table 6: Simple Mean Test for CPRs and PPRs

Group	N	Mean	SD
CPRs	5	289700.60	35359.98
PPRs	5	337003.00	35420.92
Total	10	313351.80	41651.56

Note: N = Number of observations; SD = Standard Deviation

The descriptive statistics in Table 6 indicate the average levels and variability of CPRs and PPRs over the study period. The mean value of CPRs stands at 289700.60 with a standard deviation of 35359.98, whereas PPRs record a higher mean of 337003.00 with a standard deviation of 35420.92. This clearly shows that, on average, PPRs are more dominant than CPRs in the dataset. At the same time, the closeness in their standard deviation values suggests that both variables exhibit a similar degree of variation over time, indicating a fairly steady pattern of change without extreme fluctuations in either category. When the combined data is considered, the overall mean is 313351.80 with a standard deviation of 41651.56, reflecting the general level and spread of the observations used in the analysis. Taken together, the results point to a clear structural difference between the two categories, with private property resources occupying a larger share than common property resources throughout the period under study. This pattern also hints at a gradual shift in land and resource distribution, where PPRs appear to have maintained a relatively stronger position compared to CPRs over time.

Conclusion:

The study reveals that significant changes have taken place in the land use pattern and resource structure of Dindigul District between 1994 and 2025. Common Property Resources (CPRs) showed a gradual increase, while Private Property Resources (PPRs) declined over the study period. The reduction in net cultivated area and the rise in fallow land indicate increasing pressure on agricultural resources due to urbanization, environmental changes, and shifting economic activities. The statistical analysis confirms a strong relationship between time and changes in CPRs. The study highlights the importance of protecting common resources through proper land management, conservation measures, and community participation to ensure sustainable rural development and environmental balance.

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