A REGIONAL AND SECTORAL ANALYSIS OF FUND ALLOCATION AND EXPENDITURE ACROSS CENSUS TOWNS IN KERALA: EVIDENCE FROM 2016-17 TO 2025-26

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

In the recent years, the urbanisation process in India has gone through a significant structural transformation. Although the earlier stages of urban development were influenced by the growth of statutory towns and metropolitan centres, the Census of India 2011 the number of census towns in India have risen drastically. Census Towns are settlements having certain urban features, have certain requirements to be met, such as, minimum population of 5000, population density of at least 400 persons per square kilometre, and at least 75 percent of the male workforce in non-agricultural sectors- but are governed by rural local bodies. This anomaly in administration has lead to what several scholars have observed as 'denied' or 'unacknowledged' urbanisation, where urban characteristics exist along with rural governance structures.

Census Towns have significantly changed India's urban landscape. Many studies have shown that most of the urban population growth between 2001 and 2011 was mainly due to reclassification of rural areas into Census Towns, rather than from rural-urban migration. This transformation was mainly caused by the increase of non-farm activities, better transportation facilities, etc. Despite having urban traits, since Census Towns lack statutory status, institutional capacity and organised fiscal assistance resulting in a lack of infrastructural, planning and service delivery.

Kerala experienced a huge surge in the number of census towns in 2011, which marked a major turning point in its urbanisation pattern. Kerala's urbanisation is characterised by dispersed settlement patterns and high population density across regions. Most of this urbanisation was caused by the growth of census towns rather than due to formation of new municipalities. Since these settlements still remain under rural local bodies, the adequacy of development funds allocated to them becomes very much crucial. Sector-wise allocation including infrastructure, production and services, have a direct implication on quality of life and sustainability. The unequal distribution in sectors can lead to inadequacies in infrastructure and service delivery, whereas, regional disparities in funding may indicate spatial inequalities within the state.

Additionally, Census Towns in Kerala are unevenly distributed with some districts having a huge number of Census Towns while others have none. In such a case, it is important to analyse whether there is equitable distribution of allocation and expenditure patterns across regions. Although there have been studies on emergence and governance issues of Census Towns, there

exists limited empirical studies on sector-wise allocation and expenditure at regional level, especially in the case of Kerala.

The period from 2016-17 and 2025-26 is important as it helps to capture recent fiscal trends in the Census Towns and crucial in understanding whether the disparities have increased, decreased or remain constant over time. Also, analysing sector types help in understanding priority areas and funding imbalances. Based on this background, this research aims to analyse regional inequality in sector-wise allocation and expenditure of Census Towns in Kerala, through which a better understanding of fiscal equity, governance gaps, and urban transition in Kerala can be achieved.

1.2 Research Gap

The existing literature available about Census Towns in India mainly deals with the rapid development, spatial distribution and the role in changing the pattern of urbanisation. Several studies have addressed the concepts of subaltern urbanisation and governance challenges that emerge due to the non-statutory status of urban settlements. In case of Kerala, the study has noted the very specific tendency of dispersed urbanisation in the state and rapid increase in the number of census towns, especially since 2011.

Nevertheless, the fiscal components of Census Towns are not well explored, even though those studies present a sufficient amount of information on the demographic and spatial levels. Empirical studies regarding sector-based allocation and expenditure patterns in Census Towns, particularly at the regional level in Kerala is not much studied. The current studies do not often consider the issue of whether financial resources are equitably distributed across regions or if there are discrepancies in their actual distribution and expenditure.

Moreover, the recent period from 2016-17 upto 2025-26 reflects current fiscal trends of decentralised planning has not been analysed systematically in relation to Census Towns. There exists no region-specific and temporal fiscal analysis, which leaves a vast gap in the knowledge and understanding of financial dynamics of these rapidly expanding urban settlements.

Thus, the study by the current research has a clear research gap in terms of understanding the disparities in sector-based allocation and expenditure within each Census Towns in Kerala, which this study seeks to address.

1.3 Statement of the Problem

Urbanisation structure in Kerala has changed since 2011 due to the rapid growth of Census Towns. This has created new governance and fiscal challenges, particularly in terms of development planning, resource allocation, and service delivery. Since Census Towns are urban areas having no statutory bodies and are thus ruled by rural local bodies, concerns exist in terms of sufficiency, pattern and equity of sector-wise distribution, and expenditure in these areas. Further, Census Towns are unevenly distributed across Kerala, with some districts having high number of Census Towns, while others don't even have any. Thus, it is important to analyse whether public financial allocation and expenditure are equitable.

Even though there are works on Census Towns and urbanisation in Kerala, not much attention has been given to analysing sector-wise allocation and expenditure data across the regions, over the years, especially how it has evolved around the recent years, from 2016-17 upto 2025-26. Thus, the core issue addressed in this study is the presence of regional differences in the sectoral allocation and spending in the Census Towns in Kerala and their implications.

1.4 Scope of the Study

The current study focuses on analysing the regional inequalities in sector-wise allocation and expenditure in Census Towns in Kerala. The period of analysis ranges from 2016-17 upto 2025-26, helping to understand current fiscal trends over a long period. The study covers Census Towns within Kerala, and for the purpose of this study, the state is classified into three regions- North, Central, and South- on the basis of district-level grouping. The study compares the allocation and expenditure patterns in these regions in order to understand inter-regional differences.

The scope of the study is limited to the allocation of finances and the actual expenditure of various sectors of development. The sectors are grouped into larger sector-types in order to conduct systematic analysis. The study doesn't examine statutory municipalities or corporations, it also doesn't evaluate physical project outcomes or administrative performance. It analyses using the secondary data provided by the official government budget documents and other related sources.

Thus, the study is limited to understanding sector-wise allocation and expenditure patterns across Census Towns in Kerala and the regional inequalities and changes over time in the chosen timeline.

1.5 Objectives

The following are the objectives of the study:

i. To study the extent of regional disparities in financial allocation and expenditure across census towns in various regions in Kerala.
ii. To analyse the fund allocation and expenditure trends across sectors coming under major sector types.
iii. To analyse temporal trends in sectoral allocation and expenditure through data visualisation tools.

1.6 Methodology

The study adopts a descriptive, analytical, and inferential research design in order to look at regional differences in sectoral allocation and expenditure in Census Towns in Kerala. The study uses secondary data from the Sulekha portal. The study period is from 2016-17 and 2025-26. For the purpose of this study, the state Kerala was classified into three regions, mainly- North, Central, and South- based on the districts. From these regional stratas, a total of 20 Census Towns were selected as samples using systematic random sampling. The key variables used in the study are sectoral and regional allocation of funds, actual expenditure, and year-wise trends. The analysis of the data was carried out using graphical representations developed through Power BI visualisation tools to determine spatial and temporal patterns. Also, paired sample t-test was conducted using Microsoft Excel to test the statistical significance of regional differences in allocation and expenditure.

1.7 Hypothesis

i. Inter-regional Analysis of fund allocation

Null Hypothesis (H_0): There exists no significant difference in the mean fund allocation between the two regions.

Alternative Hypothesis (H_1): There exists significant difference in the mean fund allocation between the two regions.

ii. Inter-regional Analysis of fund expenditure

Null Hypothesis (H_0): There exists no significant difference in the mean fund expenditure between the two regions.

Alternative Hypothesis (H_1): There exists significant difference in the mean fund expenditure between the two regions.

iii. Inter-sectoral Analysis of fund allocation

Null hypothesis: There is no significant difference in mean fund allocation in the selected sectors.

Alternative hypothesis: There exists significant difference in mean fund allocation in the selected sectors.

iv. Inter-sectoral Analysis of fund expenditure

Null hypothesis: There is no significant difference in mean fund expenditure in the selected sectors.

Alternative hypothesis: There exists significant difference in mean fund expenditure in the selected sectors

1.8 Limitations of the Study

The study is subject to the following limitations:

- The study is entirely based on secondary data obtained from the government portal (Sulekha).
- Accuracy of analysis depends on the availability and reliability of the published data.

- The study is limited to only 20 Census Towns selected from 461 Census in Kerala. The sample accounts for only 4.3% of the total population.
- The study only focuses on allocation and expenditure patterns and does not take political and administrative factors into consideration.

1.9 Chapter Scheme

The study has been organised into five chapters. The main content of each chapter has been described below:

Chapter 1: This chapter consists of introduction, statement of the research problem, scope of the study, objectives of the study, methodology, hypothesis, and limitations of the study.

Chapter 2: The second chapter consists of review of literature, and examines the previously published literature works related to the topic.

Chapter 3: The third chapter gives a detailed overview of the census towns in Kerala, their growth, and distribution.

Chapter 4: The fourth chapter contains data analysis and hypothesis testing.

Chapter 5: The final chapter consists of findings and conclusion.

CHAPTER 2

REVIEW OF LITERATURE

2. Literature review

G Samanta(2014), shows the census towns (CTs) in India in a critical lens through an empirical study of Singur in West Bengal. The article considers census towns as 'in-between settlements' that show urban characteristics but are governed by rural local bodies, such as gram panchayats. This leads to, what the author calls, 'denied urbanisation' where the full potential of the urban characteristics in such census towns cannot be fully utilised as they are ruled by rural local bodies, which, had they been urban administrative areas, would have been put into good use. The author, using both secondary and primary data, shows that Singur has achieved the demographic, economic and occupational criteria associated with urban settlements, including high population density and dominance of non-agricultural employment, but has been denied the statutory urban status. The study shows how this mismatch between urban structure and rural governance causes incompetencies in terms of infrastructure, service provision and regulatory control, while dealing with unregulated real estate and commercial expansion, simultaneously. A key contribution of the article is that it says, the transition from census town to that of statutory town is not merely administrative, but deeply political, influenced by the state level power dynamics, fiscal constraints, and local political interests. The article shows the governance crisis and political resistance in Singur, and thus provides critical insights into the scenario of denied urbanisation in India, making it highly relevant for studies on census towns, especially in India.

Nijman, Dujine, and Choithani (2025) explores the socio-economic transformations happening in rural India due to rapid urbanization and the blurring of the rural-urban divide. Using census data, household surveys, and spatial analysis, the authors state that the Indian urbanisation, is rather dispersed and informal than city centric growth. The study denotes how rural areas having urban influence- such as census towns- go through significant changes in land use pattern, employment, social stratification, etc. even if they are administered by rural local bodies. The article says that such areas show uneven development outcomes, for instance, while non-agricultiural employment and income diversification increases, the access to urban infrastructure and welfare provisions remain limited. It also gives light on widening inequalities due to caste, land ownership, etc. in such areas. The article also helps in understanding such 'hidden urbanisation' and the governance challenges arising from rural administration in such urban settlements.

S Rawat(2025) shows that India's urban growth is increasingly happening outside the cities, creating economically urban, but administratively rural settlements. Using census data and policy analysis, the paper denotes how these settlements are excluded from urban governance frameworks resulting in inadequate infrastructure, weak planning, and very limited access to urban welfare schemes. The paper highlights that neither rural nor urban local bodies are efficient in managing emerging urban challenges. By giving insights on governance deficit, policy blind spots and regional variations, the paper argues that census towns represent critical but less addressed scenario of India's urban transition.

A Mitra and R Kumar (2015), used the 2011 Population Census data to assess the rapid emergence of census towns in India, indicating a shift in the country's urbanisation pattern. The study states that the growth of census towns in India is mainly contributed by spillover effects from large cities, where effects of economic activities are extended to surrounding rural areas. Using factor analysis and district level analysis, the study indicates that higher urbanisation is associated with rural diversification, rising non-agricultural employment rates, reduced rural poverty, etc. even if the strength of such relations are limited. Moreover, the paper emphasises that most of the census towns emerge from agrarian stagnation and shifts to non-farm activities. The authors also point out infrastructural and governance deficits in census towns due to administration overseen by rural local bodies which raises concerns about sustainability, service delivery, and future urban planning.

M Sahu, K C Das and B Bhuyan (2019) analyses the contribution of census towns to India's urbanisation process using census of India data from 1981-2011. The study states that while statutory towns have dominated urban growth, census towns have emerged as a crucial but less recognised driver of recent urbanisation, particularly during the 2001-2011 decade. The study shows that the sharp rise in urbanisation during this period was mainly due to the reclassification of rural settlements to census towns, which accounted for nearly one-third of urban growth. It also examines regional distribution of census towns in India, showing high concentration in states such as West Bengal, Kerala, Tamil Nadu, Maharashtra, and Uttar Pradesh, mainly attributed to sectoral shifts from agriculture to other activities, improvements in transport and connectivity, etc. The study also states that the increase in census towns is caused by real structural transformation rather than manipulation of statistical data while also emphasising on the governanace deficit in such areas leading to planning and infrastructural gaps.

K C Pradhan (2017) studies the rapid growth of census towns in India and states that a significant portion of such transition in India is institutionally unrecognised or invisible. Using census data from 2001 and 2011, the study shows that the sharp increase in the number of census towns was mainly due to the reclassification of settlements meeting demographic and occupational criteria. The study also says that most of the census towns were formed as a result of economic transition, for instance, shift of workforce from agricultural to non-agricultural fields, rather than from metropolitan spillovers or planned urbanisation. Despite having urban characteristics, since these places are governed by rural administrative bodies, they face inadequate infrastructure, weak spatial planning, and poor service delivery. The article helps in understanding governance and developmental challenges in such transitional areas by terming them as 'unacknowledged' or 'denied' urbanisation.

S N Roy and K C Pradhan (2018) provides a deep understanding of the rapid growth of census towns in India and its implications on the urbanisation process in the country. Using village-level census data from 1991-2011, the study states that India's recent urban growth is mainly driven by the reclassification of rural settlements into census towns rather than rural-urban migration. The working paper states that nearly 35% of urban population growth during 2001-11 was mainly many rural villages became census towns and not because of internal migration from villages to cities. The paper critically analyses the methodology used to identify census towns, showing how the rigid thresholds of population, occupation etc. result in the inclusion of unstable settlements and the exclusion of eligible ones. Through spatial analysis, the authors classify census towns into proximate, peripheral, clustered, and isolated categories, denoting that a major proportion of census towns emerge either in proximity to larger towns or as a part of localised clusters rather than being isolated growth centres. The paper also states that while census towns perform better when compared to other rural areas, they often lack quality employment and governance.

K Kuruvilla (2014) reviews Kerala's growth in urbanisation using census data from 1961-2011 along with the State urbanisation report of the department of town planning. The study indicates that Kerala experienced a significant rise in urbanisation from 25.9% in 2001 to 47.7% in 2011, with nearly 93% of this growth being contributed by the reclassification of rural areas to census towns. The author describes this process as 'urbanisation by implosion' which suggests economic transformation in rural areas with high population density rather than outward expansion of cities. The study finds that despite having urban features, the census towns are being governed by rural administrative bodies, which results in improper spatial planning,

waste management, public health infrastructure, and other deficiencies that hinder quality service delivery and sustainable development of such areas; the study also advocates for transformation of such census towns into town panchayats having more administrative powers to reduce such inefficiencies.

S Chakraborty (2024) examines the paradoxical nature of how cities are growing in terms of population but there is less economic growth comparatively. The author says that such a relationship holds in case of larger cities and in medium and small towns, including census towns, simultaneous growth patterns are identified. The author also highlights that a large share of the increase in India's urban population between 2001 and 2011 is due to an increase in the number of such census towns rather than an increase in migration of rural populations to urban centres. They also say that the urbanisation profile of many states such as West Bengal, Kerala, etc. is shaped by formation of more such new census towns.

S Sircar (2017) critically evaluates the urban classification system in India in case of census towns. The article argues that the main state-driven statistical frameworks do not clearly reflect the real experiences, historical developments, and complex socio-economic aspects of these new urban areas. The article also reveals a clear gap in between the official designation of urban areas and the lack of proper governance systems, planning and financial backing. The census towns are considered as places of 'unrecognised' or 'refused' where urban areas are still managed by rural administrative institutions leading to several governance and infrastructure issues. A key point of the paper is its discussion on 'competing epistemologies of the urban' contrasting census-based and geospatial methods (like the e-Geopolis framework) with 'embedded epistemologies' derived from day-to-day practices, networks and local perceptions within settlements. Sircar says that to understand changes in India's urban areas, we need to look beyond simple rural-urban classifications and adopt approaches that are more process-oriented, relational and historically grounded.

S Sircar(2018) explores census towns in India through an in-depth case study of Garbeta, a newly classified census town in West Bengal, to challenge the common urban views that focus mainly on large cities. Using the ideas of subaltern urbanisation and worlding, the study says that census towns denote autonomous and complex urban processes that cannot be fully explained through conventional rural-urban binaries or state-centric classifications. The study is based on extensive fieldwork, including interviews, focus group discussions, participatory mapping, and narrative analysis, and it shows how land relations, caste hierarchies, informal

labour regimes, and local economic practices shape the urban transformation of Garbeta. Even though categorised as urban, the governance structure in Garbeta remains rural, leading to mismatches between actual urban life and official actions taken. By focusing on daily activities and local understandings of urban life, the study adds to larger discussions about urbanisation in India, emphasizing the importance of including social justice and subaltern viewpoints in urban theory.

(Guin, 2018) examines the processes and dynamics that caused the rapid emergence of census towns in India. Using census data and other secondary sources, the author states that the reclassification of large villages into census towns shows a broader pattern of rural structural transformation. Guin's analysis shows that these new census towns denote various socio-economic characteristics, including rising non-agricultural employment, increased population density, etc. which are features typically associated with urbanisation. Despite having such urban characteristics, such settlements remain governed under rural local bodies, which results in ineffective planning and infrastructure development. The paper also focuses on rural-urban divide and shows inadequacies in such an administrative system.

(Chakrabarti S. , 2022) focuses on finding the causes of rapid growth of census towns in India during the decade 2001-2011. The thesis mainly focuses on city-specific, village-specific and transport related factors that affect the growth of census towns. Using census data and mainly focusing on West Bengal, the author observes that the growth of census towns during this period was mainly due to changes in urbanisation pattern- mainly, increase in non-farm activities, infrastructural developments, limited absorption capacity in large cities, etc.- rather than due to spillovers from metropolitan areas. It is observed that the study extends the Harris-Todaro model (which explains rural-urban migration in developing countries) to incorporate rural non-farm and urban informal sectors, indicating how restrictions in urban expansion and increase in wages in the formal sector increases non-farm employment, and thus, the number of census towns. By using empirical analysis methods such as logit regression, principal component analysis, and infrastructure proximity measures, the study points to several key causes for formation of census towns, including- higher formal sector income, transportation network development, population density, electricity, etc. The study also found that the growth pattern of census towns near Kolkata and adjacent areas is faster due to spillover effects from urban congestion, when compared to other areas.

Dr. N Sridharan and Chakrabarti adopts an agro-climatic zone-based analytical framework to analyse census towns in India. Using census 2011 data, over 15 agro-climatic zones, the authors have analysed census towns having population more than 20,000 integrating urbanisation rate into climatic region to understand spatial patterns of dispersed urban growth. The findings indicate that regions such as- Southern Plateau and Hills, West Coast Plains and Ghats, Eastern Himalayan, and Eastern Plateau and Hills- show a higher amount of census towns, despite the comparatively lesser urbanisation rates, denoting lesser city-centric expansions. Strong connection between census town growth and infrastructure has been noticed, with the evidence of many census towns emerging along national and state highways thus suggesting non-farm economic diversification. The paper highlights the link between agro-climatic conditions, cropping patterns, regional productivity, and urban transition processes, helping understand beyond administrative classifications.

Chakrabarti and Mukherjee(2020) explain the unexpected growth in census towns during the decade 2001-2011 via a formal economic and labour market framework. It is observed that the analysis was based mainly on urban economics and rural-urban migration theory and says that this growth of census towns was mainly due to the reclassification of towns and villages. The study considers both rural and urban formal and informal sectors to explain how changes in wages, cost of transportation, population density etc. affect the formation of census towns. Using the village and town level census data from West Bengal, the authors have used logit regression analysis to empirically test their set hypothesis. One of the major finding is that higher formal sector income in nearby urban centres, combined with lower urban sprawl increases the probability of formation of census towns. The study also puts light on the role of commuting-based labour mobility and the increase in rural non-farm employment in driving urbanisation.

K. C. Das (2017), uses census data from 1951-2011 to analyse the recent trends and structural shifts in urbanisation. The study highlights a phase of rapid urban growth in the 1950s to 1960s, followed by urban deceleration in 1980s to early 2000s, and further increase in urbanisation in the 2011 census. The 2011 census data is considered a turning point, as even though almost 69% of the total population was still residing in rural areas, the total increase in urban population exceeded that of rural population for the first time ever since independence. It is to be noted that by using size-class analysis, Gini concentration indices, and Lorenz curve, the paper shows a high concentration of urban population in larger cities, with around 70 per cent of the urban population in Class I towns, indicating inequalities in urban size distribution. The

study also shows rapid increase in the number of towns during the period 2001-2011, especially census towns, contributing to the overall urban growth. The paper also shows region-wise urbanisation projections, which indicate that the southern and western regions have higher urbanisation trajectories when compared to the eastern and central regions.

Chakrabarti and Mukherjee (2022) analyses the role of transport infrastructure in the formation of 526 new census towns in West Bengal between 2001 and 2011 census, where villages meeting criteria such as- population more than 5000, density more than 400/sq km, and with minimum 75% of male workforce in non-farm activities- were classified as census towns, making upto nearly 30% of national urbanisation. After using probit regression on 659 would be census towns, they found that having state/national highways increased the probability of conversion to census towns, but access to railways showed no effect. It is also observed that while local roads helped support highways across the state, they also promoted agglomorations in the bordering districts of Kolkata. The Golden Quadrilateral only had a very small impact and facilities like banks showed a positive effect in the conversion of census towns. Overall, the study shows that highways play a crucial role in spreading peri-urban growth, especially in regions where uneven development is present.

J Karmakar (2015) provides a detailed spatial and socio-economic analysis of the growth of census towns in West Bengal, rising from 252 in 2001 to 782 in 2011 and thus driving the state's urbanisation to 31.87% through the reclassification of villages based on census town criteria. The study describes the growth of census towns as a process of 'urbanisation by implosion,' meaning rural areas are turning urban due to falling agricultural jobs, rising work in trade and transport, and spillover effects from Kolkata. It is observed that most of the census towns are located in fertile Gangetic plains and the districts closer to Kolkata while areas such as lateric and coastal regions have fewer. The majority fall under Class V towns, indicating their small size, yet having noticeable socio-economic transition, invluding an overall work participation rate of 38%, higher literacy levels near Kolkata Metropolitan Area, growing household industries, etc.. Despite having these urban features, these settlements are still governed by rural local bodies, creating a mismatch that leads to poor planning and infrastructural deficits.

Ghosh and Khatun (2020) examines the differences between statutory towns and census towns through a statistical and indicator-based framework. By using micro-level data, the study shows that statutory towns show better performance in infrastructure, service provision, and socio-

economic indicators due to their formal municipal status and access to structured financial allocations. Even though census towns have urban demographic and occupational features, it often doesn't have proper roads, drainage, sanitation, etc.. The analysis shows that census towns, not having statutory recognition, have limited fiscal autonomy, planning capacity, and administrative authority, thus hindering development.

Mitra and Tripathi (2020) analyses the economic determinants behind the formation of new census towns in India during 2001-2011. By using data on 2328 census towns and employing hierarchical cluster analysis, the authors identifies the key causes of rural to urban transformation. The study associates the rise in census towns to expansion of non-farm activities, infrastructure availability, and spillover effects from large cities, rather than rural poverty or unemployment alone. The development patterns of such towns are affected by factors such as road connectivity, electricity, sanitation, presence of manufacturing industries and closeness to major cities. The analysis tells that many census towns benefit from agglomeration economies of nearby cities.

CHAPTER 3

OVERVIEW

3.1 Introduction

Urban areas in India are officially classified two categories by Census of India- Statutory Towns and Census Towns. Of these, statutory towns are given municipal status by the government and include all the places that are governed by urban local bodies, such as municipal corporation, municipalities (or municipal councils), nagar panchayats or town panchayats, or a notified town area committee. Statutory towns with a population more than 100000 are then categorized as cities, setting them apart from smaller settlements. Whereas, Census Towns are rural areas with urban features that need to meet certain standards established by the Central Government to be classified as such. The criteria, as defined by the Census of India includes the following:

i. A minimum population of 5000 persons
ii. Population density of at least 400 persons per sq. kilometer
iii. At least 75 per cent of the male main working population engaged in the non-agricultural pursuits.

Despite having certain urban features, the Census Towns lack a formal urban status and are governed by rural local bodies like Gram Panchayats, which leads to issues with service delivery, infrastructure development, and planning. These are transitional areas which are between rural areas and urban areas, and are identified during the population census conducted by the Office of the Registrar General and Census Commissioner, India.

3.2 Census Towns in India

Across the past decades, India has seen a noticeable increase in the number of Census Towns, shown by table 3.1 which says that there was a steady increase in Census Towns between 1981 and 1991, then a drop in 2001, suggesting either stricter application of the criteria or reclassification into statutory towns. However, the rapid increase in 2011, where Census Towns formed almost half (49.1%) of the total number of towns, shows the structural shift in India's urbanisation process. This underscores the growing importance of these in-between areas, pointing to a way urban areas grow outside existing city setups.

Table 3.1: Growth of census towns in India (1981-2011)

Census Years	No. of Census Towns	Share of Census Towns to Total Towns
1981	1271	31.5
1991	1702	36.3
2001	1361	26.0
2011	3894	49.1

Source: Adapted from Sahu,M., Das,K.C.,&Bhuyan,B. (2019), Role of census towns in rising urbanisation of India. Nagarlok, 1(Part-4), 1-14.

3.3 Urbanisation Trends

Table 3.2: Urbanisation in Kerala and India, 1961-2011

Census	Degree of Urbanisation- Kerala	Degree of Urbanisation- India
1961	15.11	17.97
1971	16.24	19.91
1981	18.78	23.34
1991	26.44	25.71
2001	25.96	27.8
2011	47.72	31.1

Source: Kuruvilla, K. (2014). Census towns in Kerala: Challenges of urban transformation. Research notebooks, School of Habitat Studies, 1-12.

The table 3.2 provides us with the level of urbanisation in Kerala relative to the one in India. As it can be seen, Kerala had a lower degree of urbanisation than India between 1961-1981, and it overtook the national level in 1991. Again it fell below the all-India level in 2001 and it rose far above the national level in 2011. Such a drastic rise indicates that there is structural change in the urbanisation pattern in Kerala, of which, the biggest feature is the huge number of Census Towns.

3.4 Census Towns in Kerala

Kerala is also experiencing a different pattern of urbanisation where the growth of Census Towns within the state has taken place and this grew primarily because of the development of rural areas with urban features without a statutory government and such areas have been governed by the rural local governments.

Table 3.3: Growth of Census Towns in Kerala

Census Year	Census Towns	Total Urban Areas	Percentage of Census Towns in Urban Areas
1961	65	93	69
1971	55	88	62
1981	60	111	54
1991	138	219	63
2001	101	194	52
2011	461	520	88

Source: Adapted from Kuruvilla, K. (2014). Census towns in Kerala: Challenges of urban transformation. Research notebooks, School of Habitat Studies, 1-12.

Table 3.3 represents the long-term growth trend of Census Towns in Kerala between 1961 and 2011. The percentage of census towns has a decreasing tendency since 1961-1981, but the number of Census Towns and total urban area were rather varying. The proportion of Census Towns rose in 1991 with the Census Towns and the total urban areas and the figure went down in 2001. The year 2011 recorded a very high increase in the number of census towns (461) that was more than a fourfold increase compared to that of the last census year. During the same year, the total urban areas have been 520, a record high, indicating overall urban transformation in Kerala. The share of census towns in urban areas also increased steeply to 88 percent in the same year. This structural shift in Kerala's urbanisation was primarily by identification or re-identification of new census towns, and not by establishment of statutory municipalities. The high levels of census towns affect governance and financial management and thus, an analysis on allocation and expenditure pattern among regions in the state is needed.

3.5 District-Wise Distribution of Census Towns in Kerala

According to Census 2011, there are a total of 461 census towns in Kerala and as explained in methodology, the spatial distribution of the census towns varies significantly, as presented in table 3.4.

Table 3.4: District-Wise Distribution of Census Towns in Kerala

Sl. No.	District	Number of Census Towns	Percentage share of total Census Towns (in%)
1	Kasaragod	25	5.42
2	Kannur	60	13.02
3	Wayanad	0	0.00
4	Kozhikode	48	10.41
5	Malappuram	39	8.46
6	Palakkad	17	3.69
7	Thrissur	128	27.77
8	Ernakulam	47	10.20
9	Idukki	0	0.00
10	Kottayam	13	2.82
11	Alappuzha	33	7.16
12	Pathanamthitta	1	0.22
13	Kollam	24	5.21
14	Thiruvananthapuram	26	5.64

Source: Census of India, Provisional population totals, Paper 2, Volume 1 of 2011, Kerala Series 33, adapted and compiled by author.

Based on table 3.4, it can be seen that Thrissur alone accounts for 27.77 percent of the total census towns in the state, followed by Kannur (13.02 percent) and Kozhikode (10.41 percent). On the other hand, the number of census towns in districts such as Wayanad and Idukki is zero, and Pathanamthitta only has 0.22 per cent of census towns. The distribution of census towns in such districts exhibit regional variation in the pattern of urbanisation in Kerala.

3.6 Conclusion

This chapter discussed the growth and spatial distribution of Census Towns in India and Kerala. The analysis has shown that the growth of urban areas in Kerala has been especially contributed by the large increase in Census Towns, parrticularly in 2011. The district-wise analysis further showed a highly uneven spatial concentration in the state. While some districts such as Thrissur, Kannur, and Kozhikode account for a significant share, some other districts like Wayanad, and Idukki report no Census Towns. Such unequal distribution pattern shows that the urban structure of Kerala is very much diverse.

With such a spatial imbalance and the consequent gaps in governance, the following chapters thus examine regional disparities in allocation and expenditure in Census Towns in Kerala in the period covered by the study 2016-17 to 2025-26.

CHAPTER 4

ANALYSIS OF DATA

4. Analysis of Data

This chapter analyses the allocation and expenditure by the selected Census Towns in Kerala between 2016-17 and 2025-26 focusing on the regional and sectoral aspects. The analysis is conducted within a regional framework by classifying the Census Towns in the state, Kerala, into three regions, mainly- North, Central, and South- on the basis of districts to study the inter-regional differences in allocation and expenditure. The data on allocation and expenditure were also analysed to study the temporal trends across major sector types and sectors. The major three sector types are- production (ഉല്പാദനം), infrastructure (പശ്ചാത്തലം), and services (സേവനം). Visualisation through graphs created using Power BI are used to show patterns and comparisons. Also, paired sample t-test was used to establish the statistical significance of regional variations.

The chapter has been divided into different sections, including:

4.1 Regional Analysis: It examines the inter-regional differences in sectoral allocation and expenditure

4.2 Sectoral Analysis: It explores the sectoral differences in allocation and expenditure of funds.

4.3 Empirical Testing: It uses paired sample t-test to analyse the statistical significance of the regional differences.

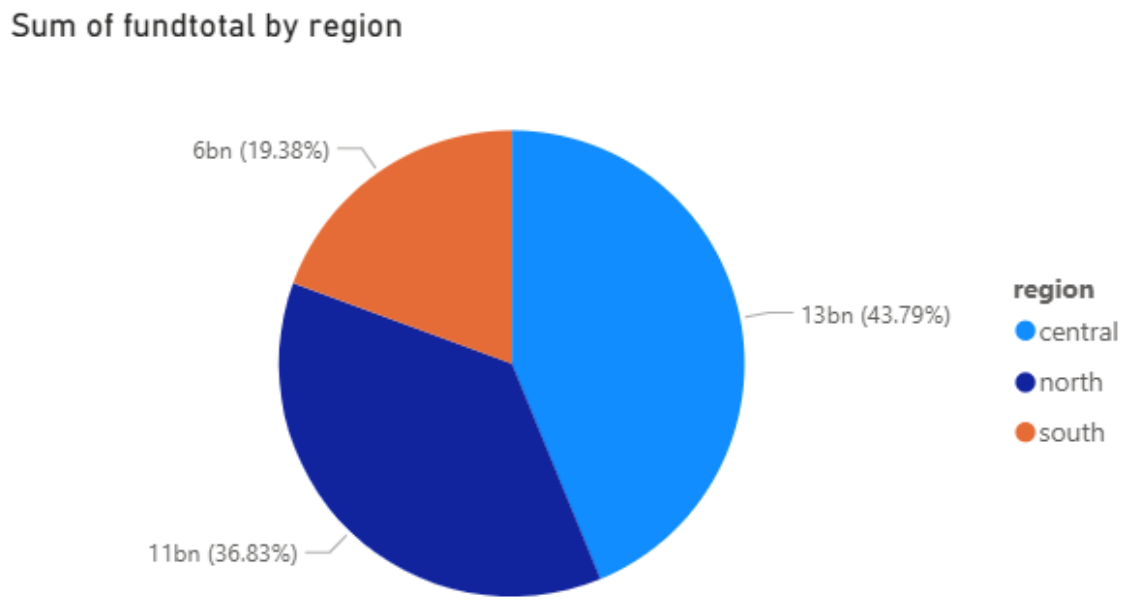
4.1 Regional Analysis

This section analyses regional differences in allocation and expenditure across the selected Census Towns in Kerala during the period 2016-17 and 2025-26. For the purpose of analysis, the state has been divided into three regions- North, Central, and South to help in comparison of the regional differences. Observing both aggregate and sector-specific patterns, this section evaluates the allocation patterns within the regions and also explores the level of inequalities across the regions in terms of fund expenditure. This analysis forms the base of further empirical testing using hypothesis.

4.1.1 Regional Allocation of Funds

Figure 4.1

Sum of Fund Total by Region



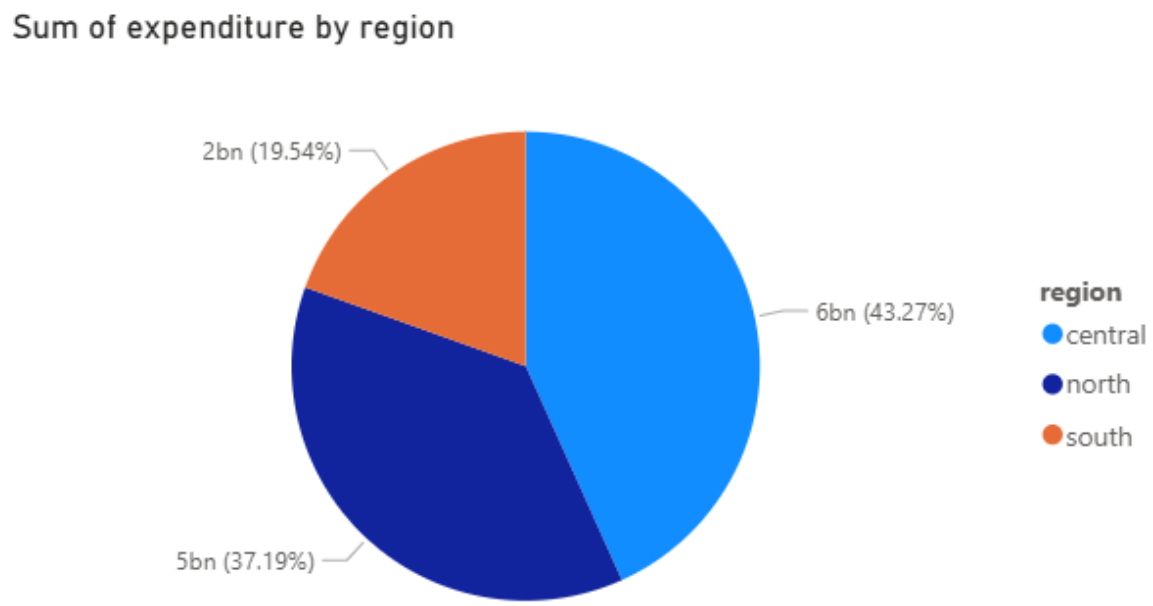
Source: Primary Data

The pie chart in figure 4.1 shows that the percentage of total funds allocated in the Central region is the highest, receiving 13 billion (43.79%) of the total distribution, which is followed by the Northern region having 11 billion, accounting for 36.83% of the total allocation. The Southern region receives the lowest, 6 billion (19.38%). The pie diagram shows a significant level of concentration of funds in the Central region, while the Southern region has received less than one-fifth of the total allocation and less than half of the amount allocated to the Central region. This difference shows an uneven pattern in regional fund distribution. Such disparities in allocation denote disproportionality in the allocation of funds to different regions and implies that there are regional differences in terms of allocation of funds.

4.1.2 Regional Expenditure of Funds

Figure 4.2

Sum of expenditure by region



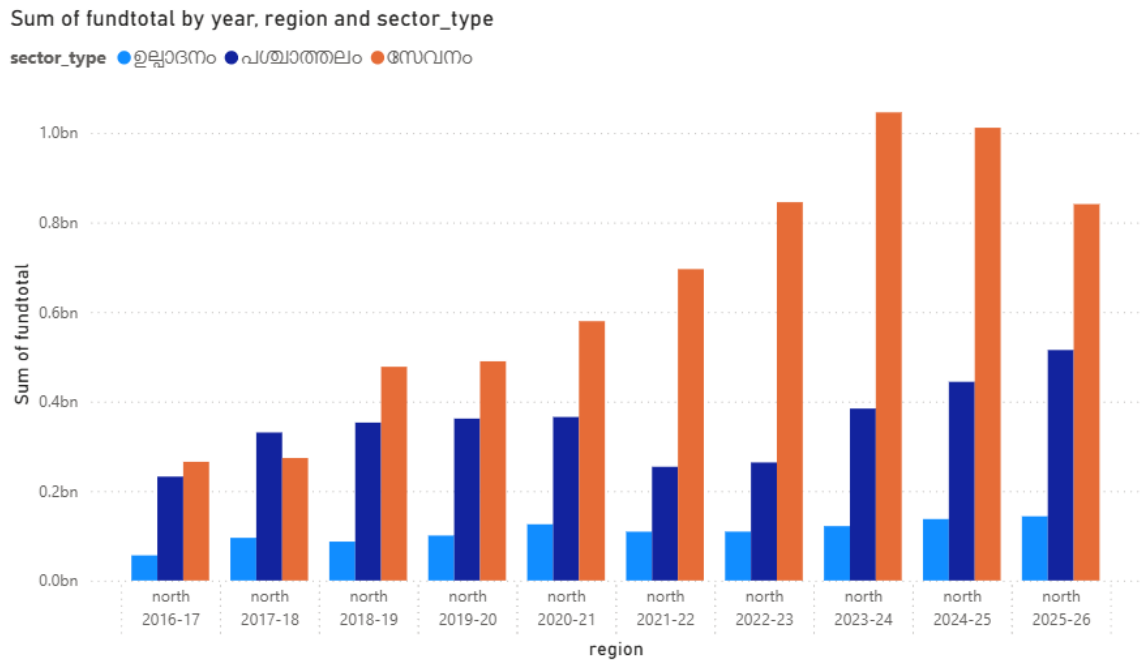
Source: Primary Data

The pie chart in figure 4.2 shows that the Central region has the highest expenditure (6 billion), accounting for 43.27% of the total expenditure, which shows that nearly half of the expenditure occurred in this region. The North region is the region with second-largest share in expenditure with 5 billion, constituting 37.19% of the total expenditure. On the other hand, the Southern region spends the least with 2 billion, amounting upto 19.54% of the total amount, that is, it spends almost one-fifth of the total. The difference shows a regional difference in terms of regional fund expenditure, indicating that the majority of the expenditure was undertaken by the Central and Northern regions, while the Southern region accounts for a significantly smaller proportion.

4.1.3 Sectoral Fund Allocation Trend in Northern Region

Figure 4.3

Sum of fund total by year and sector-type in Northern region



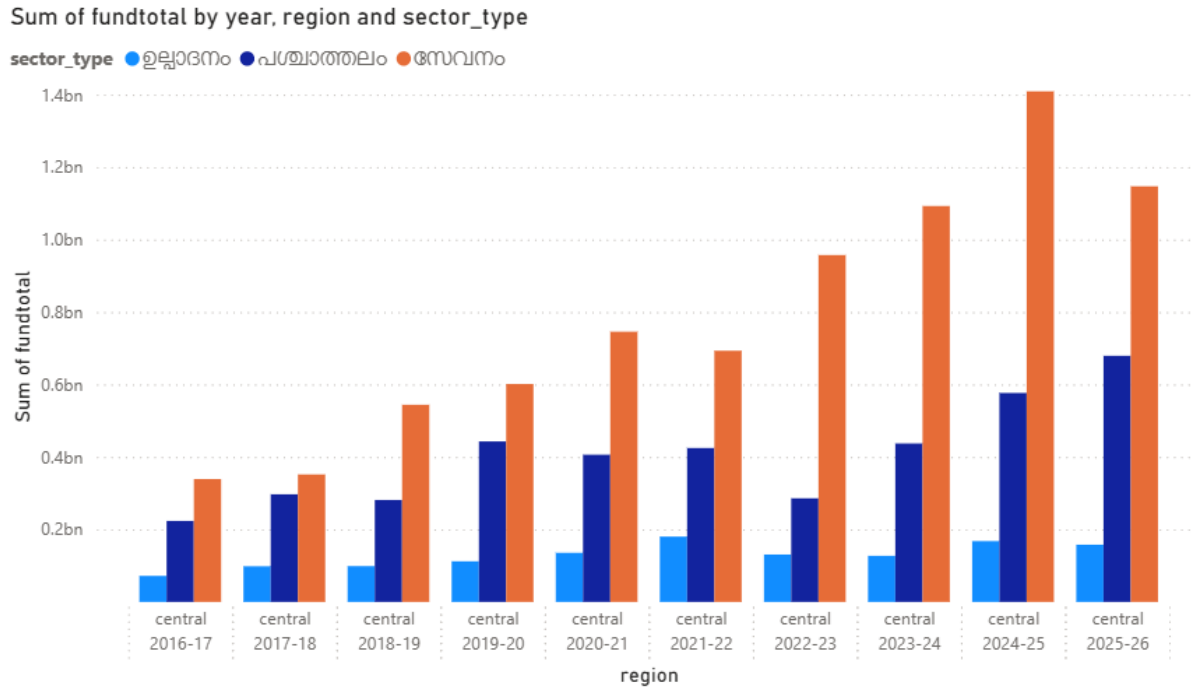
Source: Primary Data

In fig. 4.3, the bar chart shows the total fund allocation over the years (2016-17 to 2025-26) for the Northern region, categorised by three sector types- production, infrastructure, and services. Overall, there is a clear increase in funding that is evident in most years, especially in service sector, which consistently received the highest fund allocation, except for the year 2017-18, where infrastructure received the highest, around 0.3 billion. The service sector shows an almost consistent growth from 2016-17 (more than 0.2billion) and rises sharply after 2020-21 (nearly 0.6 billion), reaching a peak in 2023-24 (more than 1billion) and maintaining a high level through 2025-26 (more than 0.8 billion) even though there was a slight decline in the same year. The infrastructure sector gets the second largest share of funds in the North. It shows a slow rise in the early years (more than 0.2billion), a slight decline in 2021-22 and 2022-23 (but still remaining more than 0.2 billion) and a sharp rise in 2023-24 (around 0.4billion), and peaks in 2025-26 (around 0.5 billion). The production sector, despite having the least fund allocation, shows a steady increase in funding over the years, but consistently remaining below 0.2 billion.

4.1.4 Sectoral Fund Allocation Trend in Central Region

Figure 4.4

Sum of fund total by year and sector-type in Central region



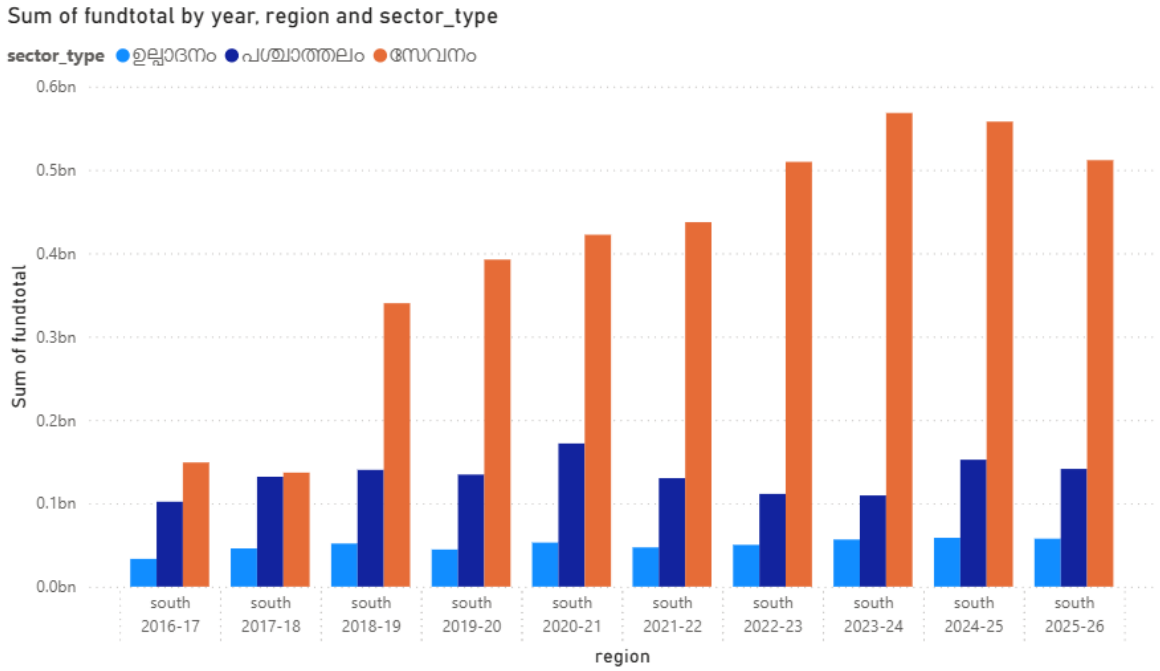
Source: Primary Data

The bar chart in figure 4.4 shows the total fund allocated to the Central region from 2016-17 upto 2025-26, which has been classified according to the three sector types- production, infrastructure, and services- among which, the service sector receives the highest funds among the three. The service sector rises consistently from the early years (more than 0.2 billion) till 2020-21 (more than 0.7billion), with a slight dip in 2021-22 (above 0.6 billion) and afterwards, rising sharply and reaching its peak in 2024-25 (around 1.4billion) but slightly declining in 2025-26 (more than one billion), while still maintaining its highest position. The infrastructure sector receives the second-highest funding and also shows a general increase over the years, with above 0.2 billion in the early years, reaching above 0.4billion in 2019-20. Although there are minor variations and a slight decline in 2022-23 (above 0.2billion), it further rises and reaches its highest level in 2025-26 (above 0.6 billion). On the other hand, the production sector received the lowest share of funds, showing small but consistent growth over the years with small dips in the years 2022-23 and 2023-24, but always remaining below 0.2 billion.

4.1.5 Sectoral Fund Allocation Trend in Southern Region

Figure 4.5

Sum of fund total by year and sector-type in Southern region



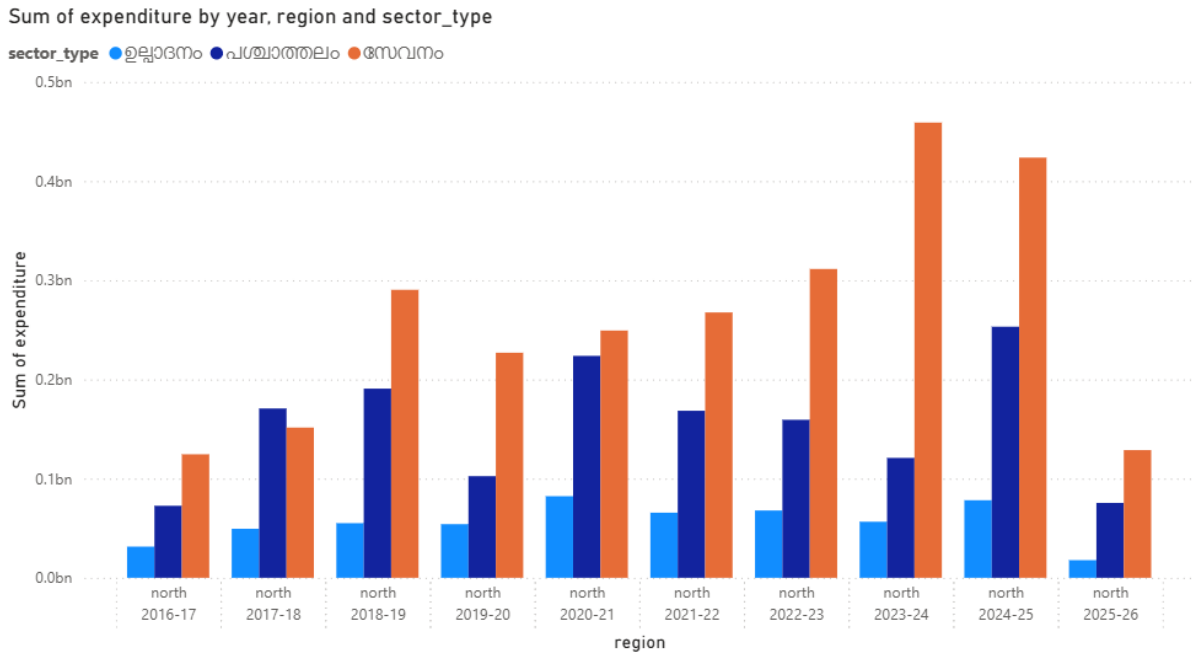
Source: Primary Data

The bar chart in figure 4.5 shows the total fund allocated to the Southern region from 2016-17 till 2025-26, which has been classified according to the three sector types- production, infrastructure, and services. Overall, the service sector has received the highest funding and shows a strong upward trend. Starting from a relatively smaller amount (more than 0.1billion) in 2016-17 it rises sharply over the years, with a steep rise in 2018-19 (more than 0.3billion), reaching its peak in 2023-24 (more than 0.5 billion), which is followed by a declining trend in the following years (but still more than 0.5 billion), even though the service sector still remains as the dominant one. Infrastructure sector records the second largest share of funds, also having a relatively fluctuating pattern than the other two sector types. It shows rise in the years from 2016-17 (around 0.1billion) and reaching its peak in 2020-21 (more than 0.1billion), then further declining from 2021-22 and remaining around 0.1billion, up until 2024-25 where it rose and then slightly declined in 2025-26 but remains above 0.1billion. Whereas the production sector shows an almost consistent growth over the years, even though it receives the smallest portion of funding, and always remains below 0.1billion.

4.1.6 Sectoral Fund Expenditure Trend in Northern Region

Figure 4.6

Sum of expenditure by year and sector-type in Northern region



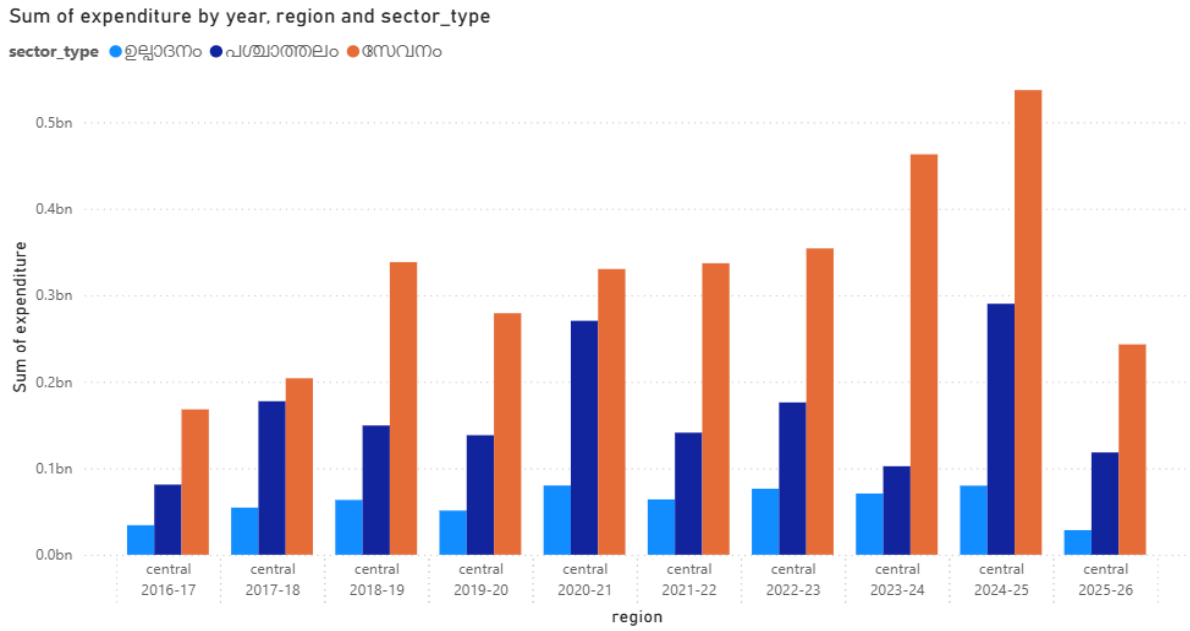
Source: Primary Data

The bar chart in figure 4.6 shows the total fund expenditure in the Northern region from 2016-17 to 2025-26 over the three sector types. The service sector shows the highest expenditure level throughout the period but shows comparatively a low level in 2016-17 (above 0.1billion) and falls lower than the infrastructure sector in 2017-18, and then rises notably in 2018-19 (around 0.3billion), slightly declines in the next year and reaches its highest in the period in 2023-24 (above 0.4billion). It then shows a decline in 2024-25 but remains above 0.4billion which is followed by a steep decline in 2025-26, reaching above 0.1billion, even though it still remains as the sector type with the highest expenditure. The infrastructure sector shows the second-highest spending and shows a fluctuating pattern. It increases in the initial years (from less than 0.1billion in 2016-17 to more than it in 2018-19), drops around 2019-20 (around 0.1 billion), rises again in 2020-21 (above 0.2billion) and drops further in the following years to reach above 0.1billion in 2023-24and reaches its peak in 2024-25 (above 0.2billion), which again declines in 2025-26 (less than 0.1billion). On the other hand, the production sector has the lowest expenditure in all the years, with minor fluctuations, reaching its peak in 2020-21 and its lowest in 2025-26, but always remaining below 0.1billion.

4.1.7 Sectoral Fund Expenditure Trend in Central Region

Figure 4.7

Sum of expenditure by year and sector-type in Central region



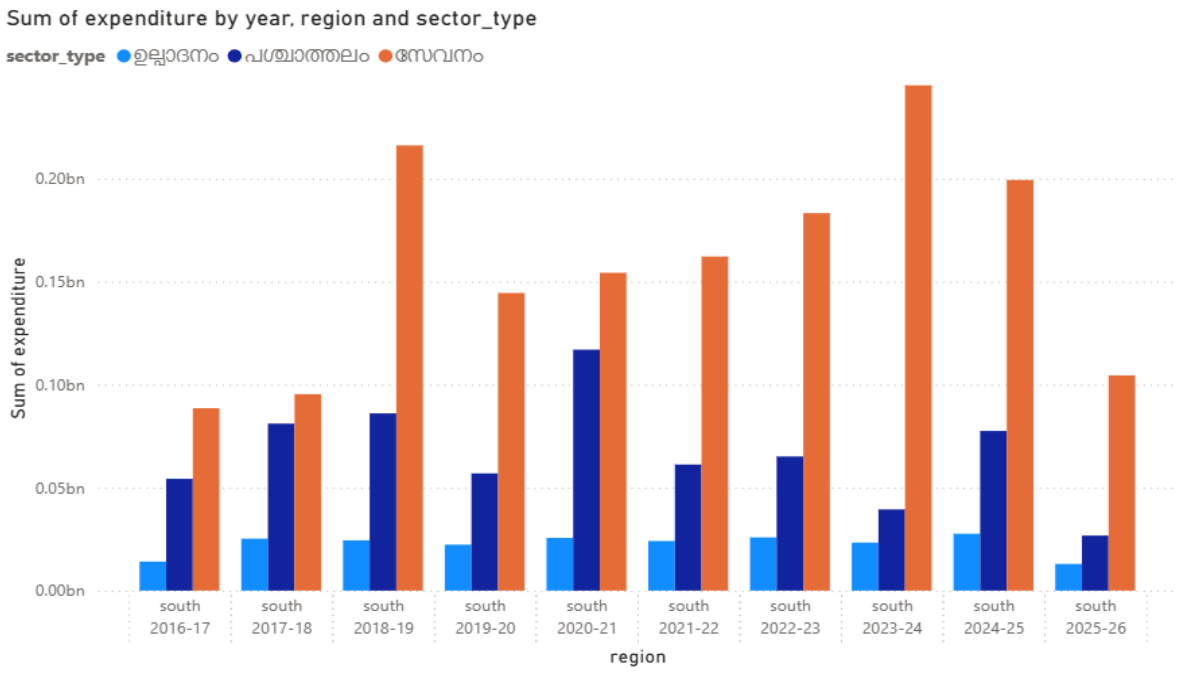
Source: Primary Data

The bar chart in figure 4.7 shows the total expenditure in the Central region from 2016-17 to 2025-26, which has been classified into three major sector types- production, infrastructure, and services. The service sector shows the highest expenditure with the spending in this sector rising steadily from 2016-17 (above 0.1billion), a notable increase in 2018-19 (above 0.3billion), a slight decline in 2019-20 (below 0.3billion), which is then followed by steady growth from 2020-21 (above 0.3billion) until it sharply rises in 2023-24 (above 0.4billion), which further rises in 2024-25 (more than 0.5billion). It then steeply falls in 2025-26 (less than 0.3billion), even though it remains as the sector with highest expenditure throughout the period. The second-highest expenditure is made by the infrastructure sector which increases in the earlier years (below 0.1billion in 2016-17, further increases), dips around 2018-19 and 2019-20 but remaining above 0.1billion, then rises sharply in 2020-21 (above 0.2billion), which is then followed by a steep fall in 2021-22 (above 0.1billion), after that, the expenditure pattern in this region faces some fluctuations before reaching another peak in 2024-25, reaching nearly 0.3billion, which is followed by a decline in 2025-26 (above 0.1billion). Whereas, the production sector shows the least expenditure (below 0.1billion) throughout the years, and shows gradual and steady increase across most of the years, with only minor fluctuations.

4.1.8 Sectoral Fund Expenditure Trend in Central Region

Figure 4.8

Sum of expenditure by year and sector-type in Southern region



Source: Primary Data

In the bar chart in figure 4.8, we can see the total expenditure by year and sector type in the Southern region which has been classified into the three sector types. We can see that the service sector has the highest spending over the years. It shows a consistent growth in the early years (above 0.05billion) and sharply increases in 2018-19 (above 0.2 billion) and declines in 2019-20 (below 0.15billion), then it grows steadily until it reaches its peak in 2023-24 (more than 0.2billion) and then further declines in the following years, reaching just above 0.1billion in 2025-26, but still remaining as the sector having the highest expenditure. The infrastructure sector shows the second-largest share of expenditure and shows noticeable fluctuations. In the initial years, it grows consistently, but declines slightly in 2019-20 but always remaining above 0.05billion, and reaches its highest in 2020-21 (above 0.1billion) and further declines until 2024-25 (above 0.05billion), where it again rises slightly and further declines in the year 2025-26 (below 0.05billion). The production sector accounts for the lowest expenditure throughout the years, but shows a slow but steady increase across most of the years, with only a slight decline in the year 2025-26 but always remaining below 0.05billion.

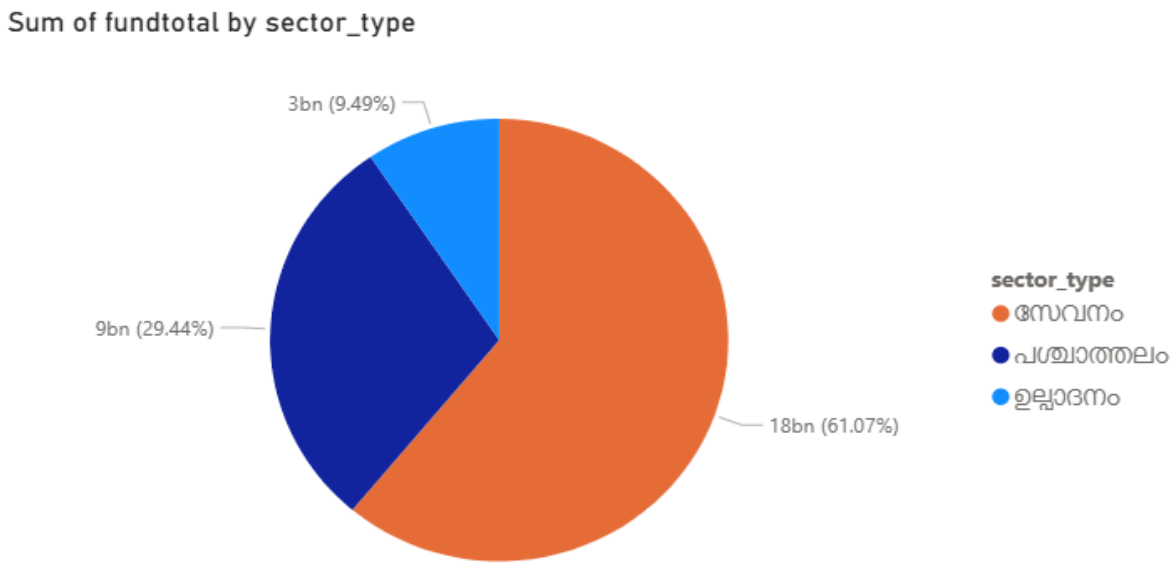
4.2 Sectoral Analysis

This section analyses the allocation and expenditure in the key sectoral categories in the selected Census Towns in Kerala during the period from 2016-17 to 2025-26. The sectors coming under major sector types were also taken into consideration to enable systematic comparison and to be able to read the funding priorities with better understanding. The analysis looks at the relative share of each sector type in total allocation and expenditure, as well as changes across time. This section aims to find out the sectoral imbalances and priority areas and the financial allocation and expenditure trends in the Census Towns.

4.2.1 Sectoral Allocation of Funds

Figure 4.9

Sum of fund total by sector type



Source: Primary Data

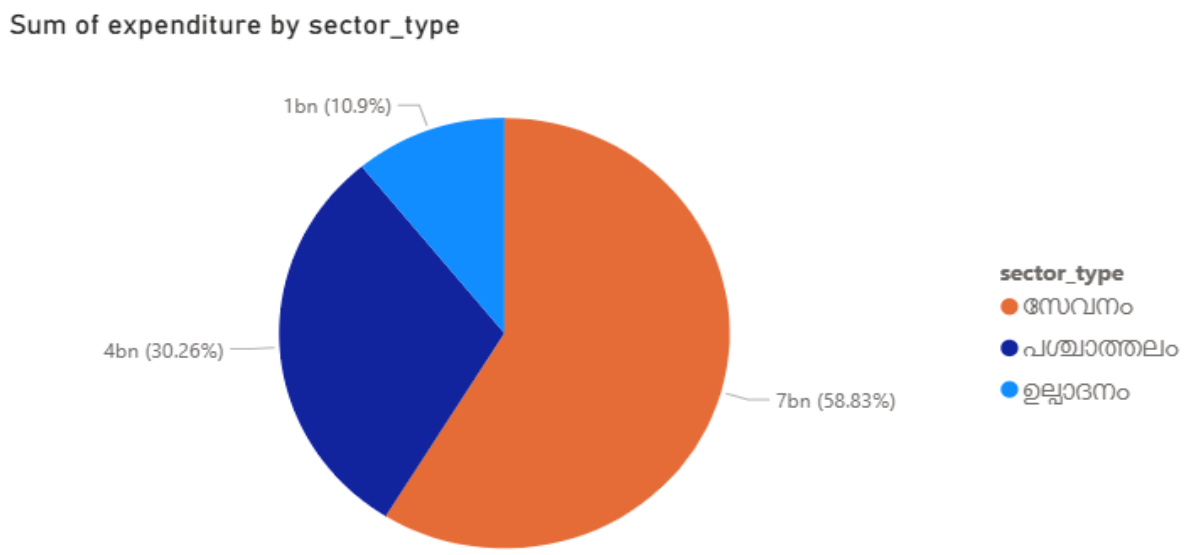
The pie chart in figure 4.9 shows the sectoral allocation of total funds across census towns in Kerala from 2016-17 to 2025-26. From which, we can see that the major share of allocation is taken over by the service sector, receiving 18 billion which occupies 61.07% of the total funds. The infrastructure sector is the second with 9billion (29.44%) and followed by the production sector, with 3billion, which accounts for only around 9.49% of the total funds allocated. This

shows that more than half of the funds allocated goes to the service sector, which is followed by the infrastructure sector, which indicates that the most priority is given to the welfare services and infrastructure development and maintenance, rather than production activities, which has long term effects of sustainability and capacity of urban development in Census Towns.

4.2.2 Sectoral Expenditure of Funds

Figure 4.10

Sum of expenditure by sector type



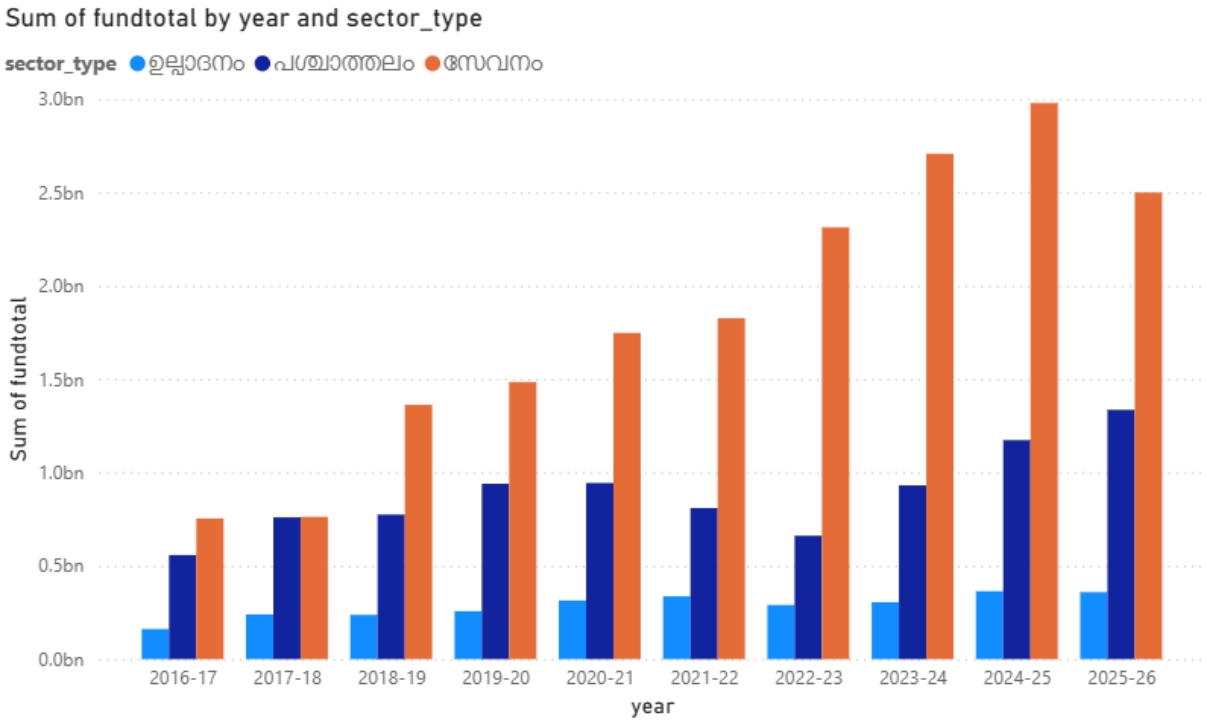
Source: Primary Data

The pie chart in figure 4.10 shows the sectoral expenditure of total funds across Census Towns in Kerala from 2016-17 to 2025-26. The service sector has the largest share in expenditure, with 7 billion, accounting for 58.83% of the total expenditure. Infrastructure sector comes next with 4 billion (30.26%) which is followed by the production sector with 1 billion, accounting for 10.9% of the total expenditure. The expenditure pattern is similar that of allocation with the service sector having the highest expenditure, followed by infrastructure, and the production sector. This indicates that major spending has occurred in the service sector, even though it is lesser than its allocation. The infrastructure sector also receives much attention when considering its spending. Whereas, the production sector raises concerns with the long-term impact of its least spending, impacting economic development.

4.2.3 Sectoral Fund Allocation Trend

Figure 4.11

Sum of fundtotal by year and sector type



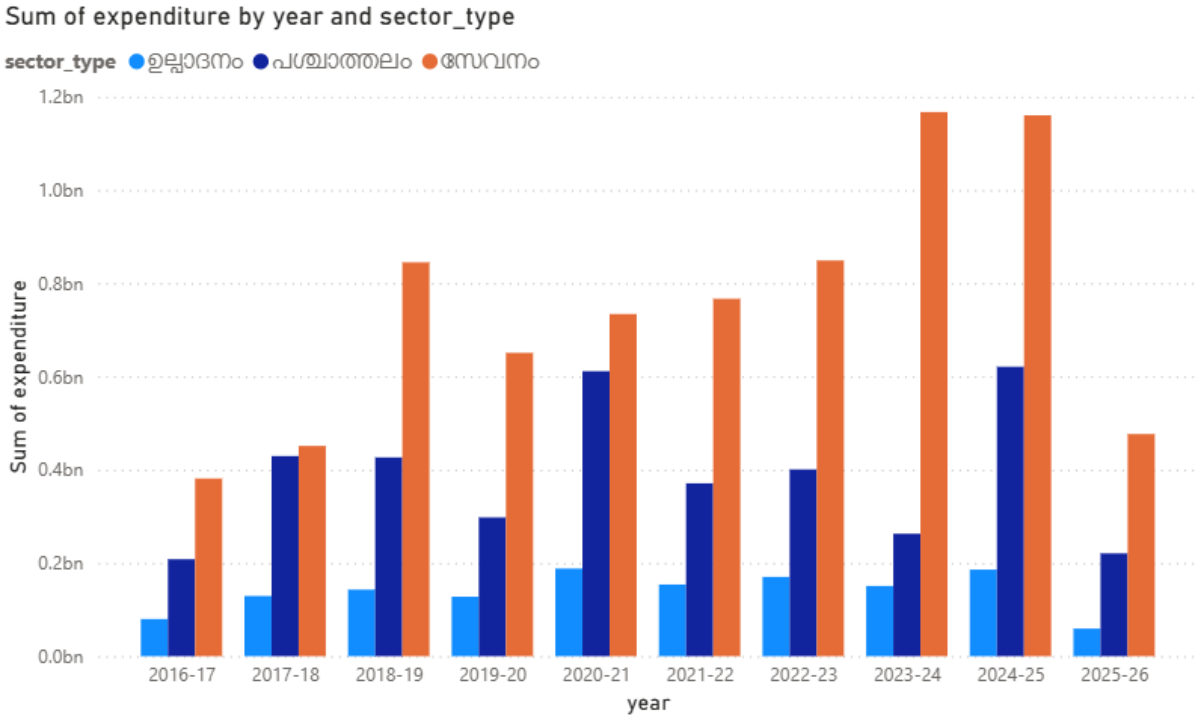
Source: Primary Data

The bar chart in figure 4.11 shows the sectoral allocation of funds in Census Towns in Kerala from 2016-17 to 2025-26. The overall allocation shows an upward trend in all three sector types. The highest allocation has occurred in service sector which grows steadily with more than 0.5 billion in 2016-17 to nearly 3 billion in 2024-25, followed by a slight decline (nearly 2.5 billion) in 2025-26. The infrastructure sector shows a slow increase with slight fluctuations, with around 0.5 billion in 2016-17 to nearly 1 billion in 2020-21, which slightly declines in the following years and dropping upto just above 0.5 billion in 2022-23. It further increases in the following years, reaching beyond 1 billion in 2024-25, rising further in 2025-26, but still remaining below 1.5 billion. On the other hand, the production sector has the lowest fund allocated to over the years, and shows a small but consistent growth over the years, but the allocation remains always below 0.5 billion and hasn't rised beyond that.

4.2.4 Sectoral Fund Expenditure Trend

Figure 4.12

Sum of expenditure by year and sector type



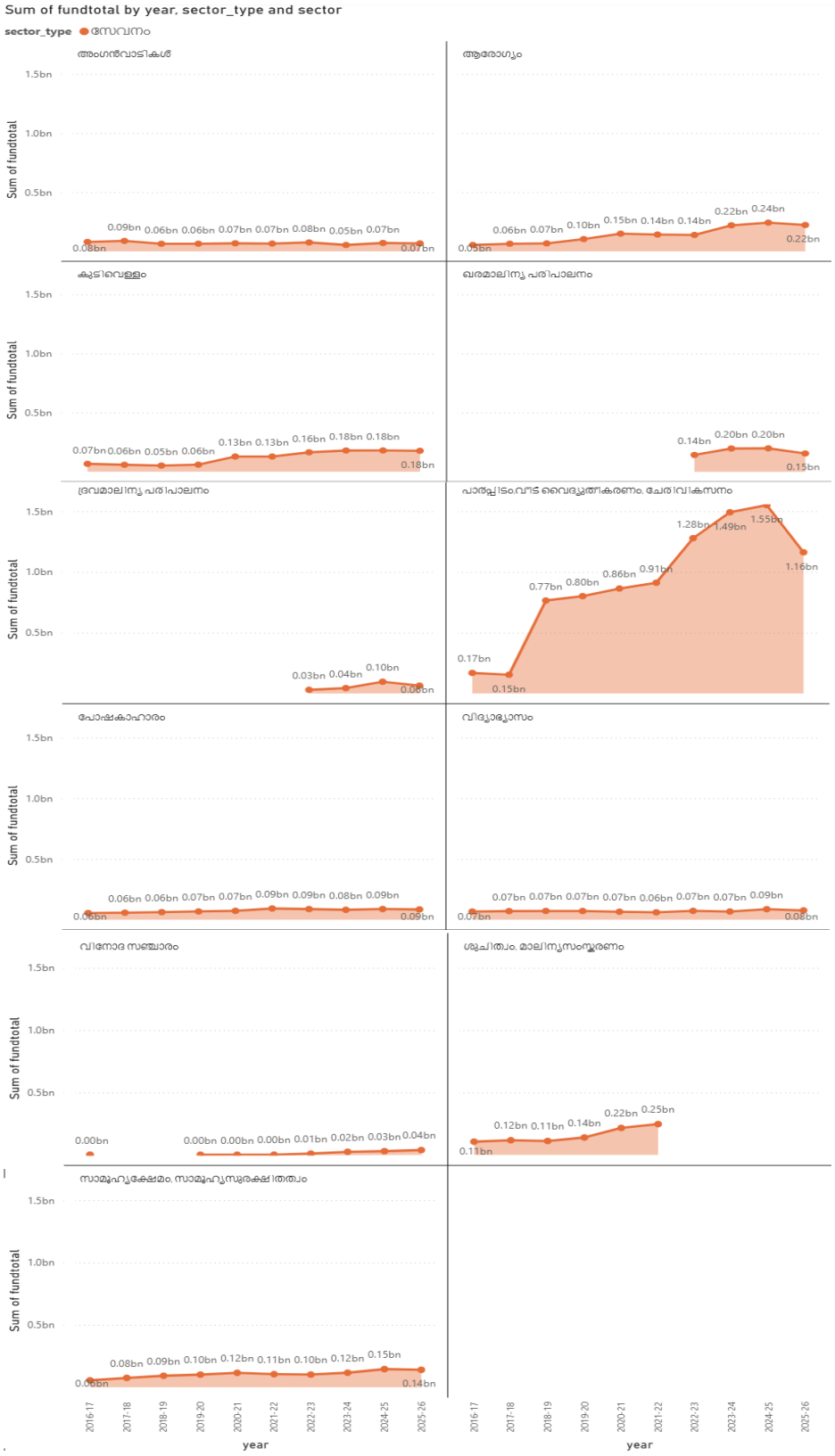
Source: Primary Data

The bar chart in figure 4.12 shows the sectoral fund expenditure in Census Towns in Kerala from 2016-17 to 2025-26. Overall, the service sector shows the highest expenditure, by steadily increasing from nearly 0.4 billion in 2016-17 to a massive increase in 2018-19 (more than 0.8 billion), followed by a slight decline in 2019-20 (above 0.6 billion) and a constantly increasing trend in the following years, with reaching its peak, almost 1.2 billion in the years 2023-24 and 2024-25, and steeply declining to below 0.6 billion in 2025-26. The infrastructure sector shows fluctuations with nearly 0.2 billion in 2016-17 and and slight increase upto 0.4 billion in the next two years, followed by a slight decline in 2019-20 (below 0.4 billion). It increases further in 2020-21, reaching slightly beyond 0.6 billion which further declines in the next year, followed by some fluctuations and reaches beyond 0.6 billion again in 2024-25 and further falls to just above 0.2 billion in 2025-26. The lowest expenditure has occurred in the production sector over the years, and shows gradual improvement upto the year 2024-25 and declines in 2025-26, but always remains below 0.2 billion.

4.2.5 Fund Allocation Within the Service Sector

Figure 4.13

Sum of Fund total by year and sector within the service sector



Source: Primary Data

From the line chart in figure 4.13, we can see that the allocation for Anganwadis slightly declined from 0.08 billion in 2016-17 to 0.07 billion in 2025-26, indicating a slight reduction throughout the study period. The fund allocated to Anganwadis was in 2017-18, at 0.09 billion, and the lowest was in 2023-24 at 0.05 billion. The trend shows moderate fluctuations with no strong long-term increase.

The allocation in health sector rose noticeably from 0.05 billion in 2016-17 to a steep rise since 2019-20 (0.1 billion) and reaching its highest allocation in 2024-25 with 0.24 billion and declined to 0.22 billion in 2025-26; which shows a clear, robust growth over the years. There was a huge increase in the allocation of funds for drinking water over the years, from 0.07 billion in 2016-17 to 0.18 billion in 2025-26 with the highest allocation being in the years 2024-25 and 2025-16, 0.18 billion.

Fund allocation for solid waste management rises from 0.14 billion in 2022-23 to 0.2 billion in 2023-24 and 2024-25, and declines to 0.15billion in 2025-26. On the other hand, the liquid waste management rose from 0.03 billion in 2022-23 0.10 billion in 2024-25, and further declined to 0.06 billion in 2025-26. The housing, home electrification and slum development sector shows the highest allocation out of all the sectors. It shows a quick rise in allocation from 0.17 billion in 2016-17 to 0.77 billion in 2018-19, and further increases to reach its peak 1.55 billion in 2024-25, to further decline in the year 2025-26 to reach 1.16 billion.

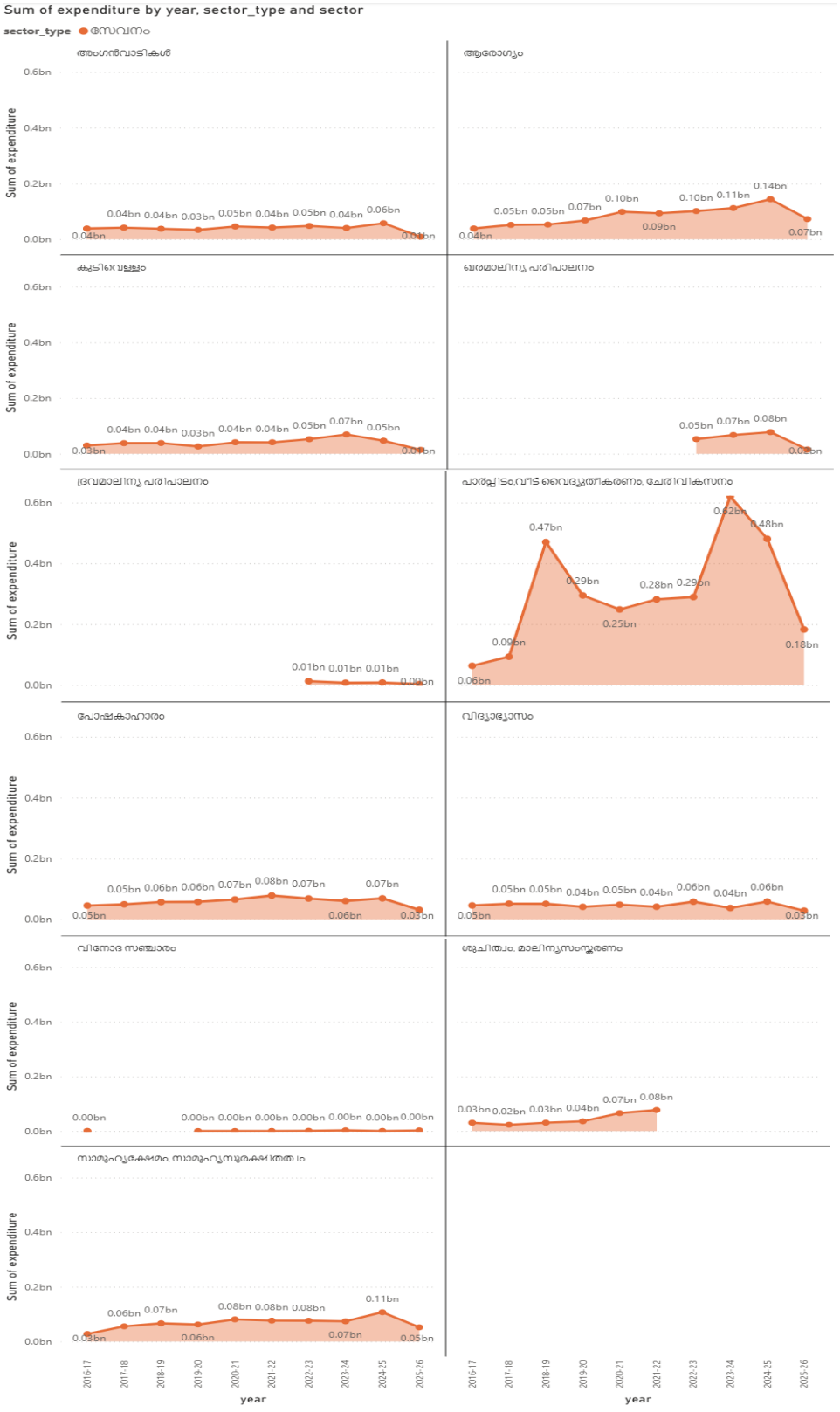
The allocation for nutrition was 0.06 billion in 2016-17 and reaches 0.09 billion in 2025-26. It reaches its highest 0.09 billion in 2021-22, and shows a consistent growth throughout the study period. The funding in education sector shows not much growth as it had 0.07 billion in 2016-17 and rose only to 0.08 billion in 2025-26. The highest allocation in this sector occurred in 2024-25 with 0.09 billion.

The fund allocation for the tourism sector rose from 0.0003 billion in 2016-17 to 0.04 billion in 2025-26, with the year 2025-26 showing the highest allocation. The fund allocation for Sanitation and waste management shows an increasing trend as it rose from 0.11billion in 2016-17 to 0.25 billion in 2021-22, after which, it was further divided into solid and liquid waste management sectors. For the social welfare and social security sector, the allocation rose from 0.06 billion in 2016-17 to 0.14 billion in 2025-26, with the highest allocation being 0.15 billion in 2024-25.

4.2.6 Fund Expenditure Within the Service Sector

Figure 4.14

Sum of Fund expenditure by year and sector within the service sector



Source: Primary Data

From the line chart in figure 4.14, we can see that the expenditure of Anganwadis rose from 0.04 billion in 2016-17 to 0.06 billion in 2024-25 and then sharply declined to 0.01 billion in 2025-26. The maximum amount of spending was in 2024-25, 0.06 billion. The decline in the kast year might be caused by under reporting or less expenditure.

The spending in the health sector was 0.04 billion in 2016-17 and rose consistently to reach its peak 0.14 billion in 2024-25, but declined in 2025-26 to reach 0.07 billion. The expenditure on drinking water has grown from 0.03 billion in 2016-17 to 0.07 billion in 2023-24, its highest, and declines further in the following years to reach 0.01 billion in 2025-26.

The expenditure on solid waste management rose from 0.05 billion in 2022-23 to 0.08 billion in 2024-25, only to decline to 0.02 billion in 2025-26. The expenditure on liquid waste management declines from 0.01 billion in 2022-23 to 0.003 billion in 2025-26.

Housing, home electrification and slum development shows the highest expenditure when compared to other sectors. Its expenditure rose from 0.06 billion in 2016-17 to reach 0.47 billion in 2018-19, further declines in the following years until it sharply reaches its peak, 0.62 billion in 2023-24 and again, declines in the following years to reach 0.18 billion in 2025-26.

The expenditure in the nutrition sector rose from 0.05 billion in 2016-17 to reach the highest level of 0.08 billion in 2021-22 and further declines in the following years to reach 0.03 billion in 2025-26. The education expenditure rose from 0.05 billion in 2016-17 to 0.06 billion in 2024-25, and further declines in year 2025-26 to reach 0.03 billion.

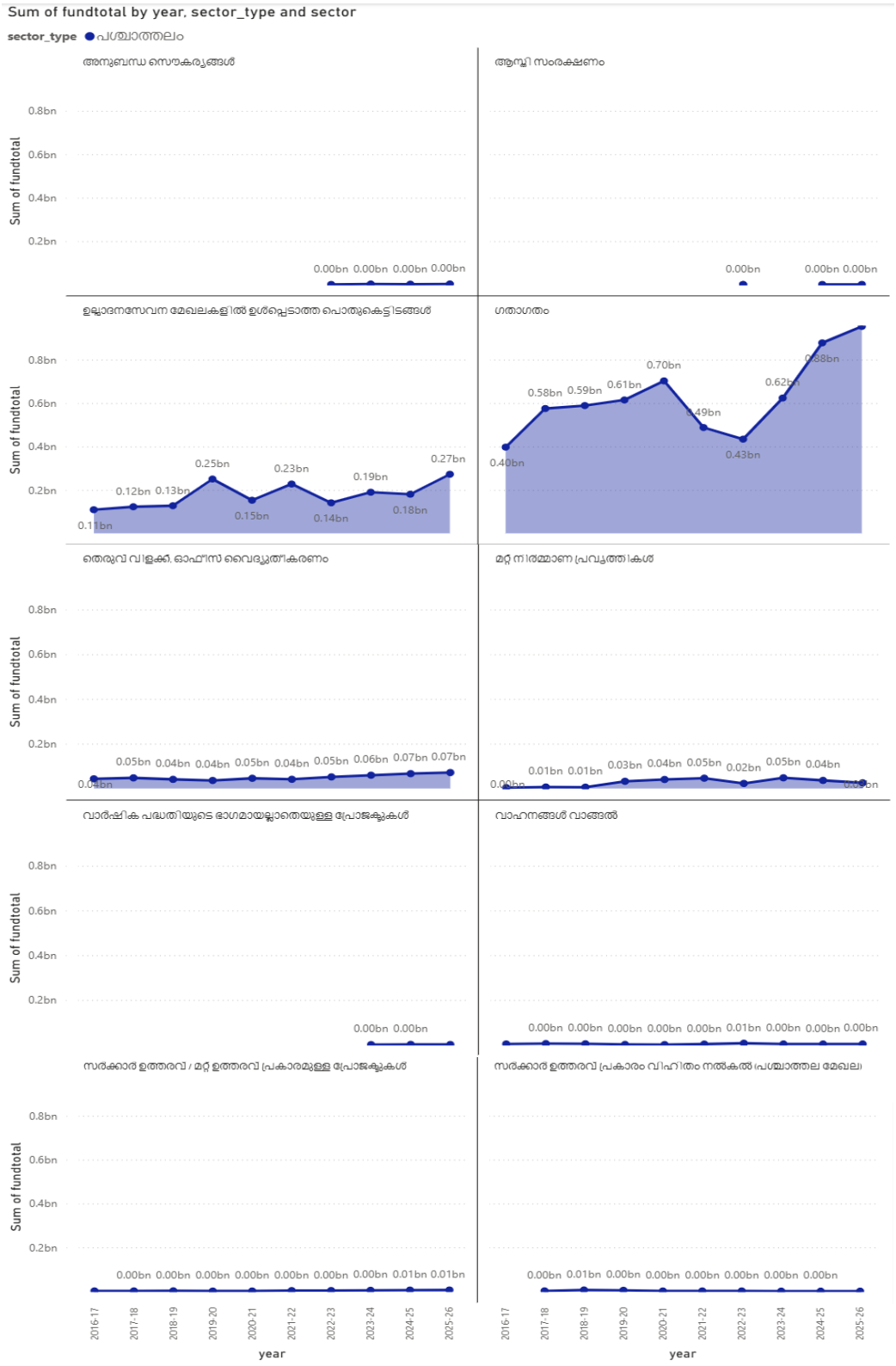
The expenditure in the tourism sector was significantly low during this period. It rose from 0.0002 billion in 2016-17 to 0.003 billion in 2025-26. The maximum allocation, 0.003 billion occurred in 2023-24. The expenditure in sanitation and waste management during the years 2016-17 and 2021-22, and expenditure rose from 0.03 billion and 0.08 billion, respectively.

The expenditure in social welfare and social security sector rose from 0.03 billion in 2016-17 to 0.11 billion in 2024-25 and then went down to 0.05 billion in 2025-26. The consistent growth shows growth of welfare and social protection programs.

4.2.7 Fund Allocation Within the Infrastructure Sector

Figure 4.15

Sum of Fund allocation by year and sector within the infrastructure sector



Source: Primary Data

The figure 4.15 shows fund allocation within the infrastructure sector. From the line graph in figure 4.15, we can see that the related facilities sector grows from 0.00065 billion in 2022-23 to 0.003 billion 2025-26.

The asset protection sector allocation rises from 0.0003 billion in 2022-23 to 0.0008 billion in 2025-26. And the sector, public buildings not included in production and service sector, shows a rise in fund allocation from 0.1 billion in 2016-17 to 0.25 billion in 2019-20, which, after several fluctuations in the following years, reaches 0.27 billion in the year 2025-26.

The transportation sector allocation grows from 0.4 billion in 2016-17 until 2020-21 where it reaches 0.7 billion and declines further in the following years until it reaches 0.43 billion in 2022-23, after which it increases in the following years to reach its peak 0.95 billion in 2025-26.

The street lighting, office electrification sector shows a small but consistent growth in fund allocation over the years by increasing from 0.04 billion in 2016-17 to 0.07 billion in the years 2024-25 and 2025-26.

Other construction works show some very small fluctuations in fund allocation, with rising from 0.0035 billion in 2016-17 to 0.05 billion in 2021-22, declining in the next year to reach 0.02 billion and further increasing to reach 0.05 billion in 2023-24 and declining in the following years to reach 0.03 billion in 2025-26.

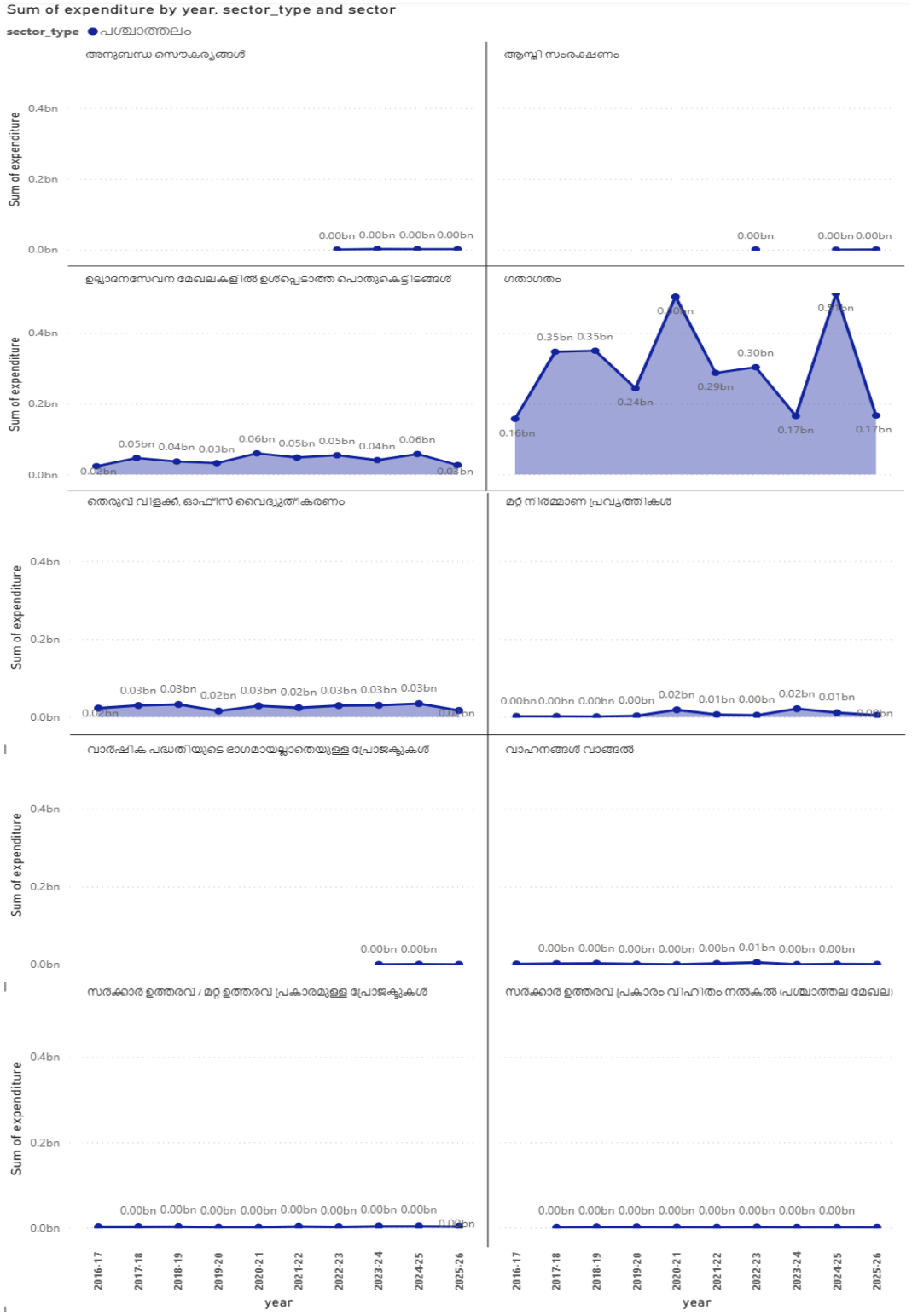
Fund allocation for projects not coming under the annual plan shows a rise in allocation from 0.0001 billion in 2023-24 to 0.0005 billion in 2025-26, showing only a slight increase. The vehicle purchase sector shows an almost consistent growth over the years, from 0.003 billion in 2016-17 to 0.003 billion in 2025-26, with the highest being 2022-23 with 0.01 billion.

Projects under government order and other orders show an increasing trend in allocation over the years, from 0.001 billion in 2016-17 to 0.01 billion in the years 2024-25 and 2025-26. Whereas, the provision of allocation in lieu of government order shows an increase in allocation from 0.001 billion in 2017-18 to 0.01 billion in 2018-19 which further declines in the following years to reach 0.0004 billion in the year 2025-26.

4.2.8 Fund Expenditure Within the Infrastructure Sector

Figure 4.16

Sum of Fund expenditure by year and sector within the infrastructure sector



Source: Primary Data

The figure 4.16 shows fund expenditure within the infrastructure sector. From the line graph in figure 4.16, we can see that the expenditure in related facilities sector grows from 0.0003 billion in 2022-23 to 0.001 billion 2025-26. The expenditure in asset protection sector shows a slight increase from 0.0002 billion in 2022-23 to 0.0005 billion in 2025-26. And the sector, public buildings not included in production and service sector, shows significant fluctuations in expenditure, rising from 0.02 billion in 0.02 billion in 2016-17 to 0.05 billion in 0.05 billion in 2017-18, then declining in the next two years, to reach 0.003 billion in 2019-20 and further increases in 2020-21 upto 0.06 billion, with moderate fluctuations in the next few years, it again reaches 0.06 billion in 2024-25, then declines in 2025-26, reaching 0.03 billion.

The transportation sector expenditure rises sharply from 0.16 billion in 2016-17 to 0.35 billion in 2017-18 and maintains it it 2018-19, then drops to 0.24 billion in 2019-20, then rises sharply to 0.50 billion in 2020-21 then drops steeply to 0.29 billion in 2021-22, only to further decline in the following years to reach 0.17 billion in 2023-24, rises rapidly again to 0.51 billion, its highest in 2024-25, then drops again in 2025-26 to 0.17 billion.

The street lighting, office electrification sector shows a small increase in expenditure in the initial years, from 0.02 billion in 2016-17 to 0.03 billion in the following years, until it drops in 2019-20 to 0.02 billion. With some minor fluctuations in the following years, it reaches 0.03 billion in 2024-25 then drops to 0.02 billion in the year 2025-26. Other construction works show some very small fluctuations in fund expenditure, rising from 0.001 billion in 2016-17 to 0.02 billion in 2020-21 which further declines in the following years and again reaches 0.02 billion in 2023-24 and declines further in the following years to reach 0.004 billion in 2025-26.

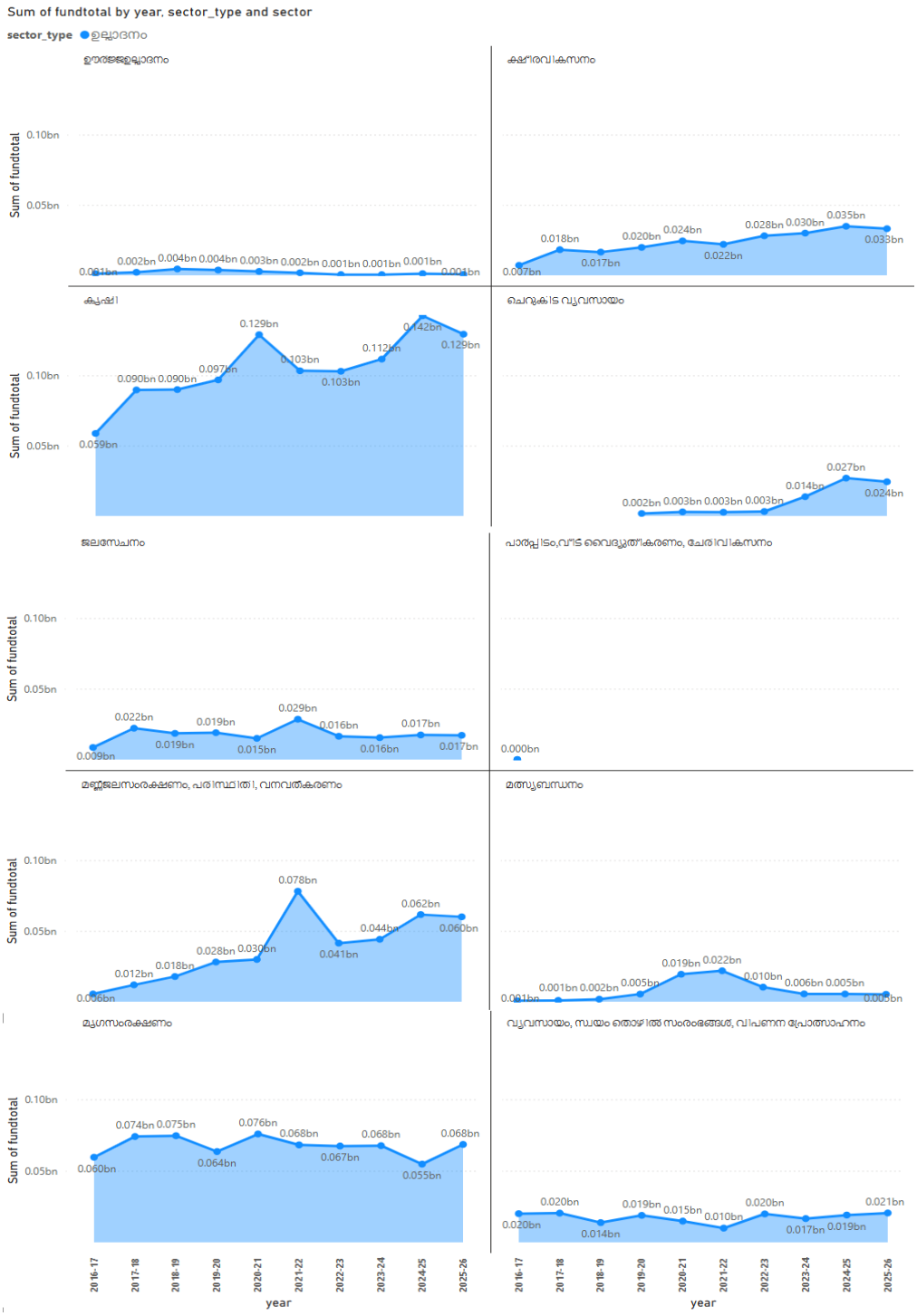
Fund expenditure for projects not coming under the annual plan shows 0.0004 billion in 2024-25 which declined to 0.0001 billion in 2025-26. The vehicle purchase sector shows an almost consistent growth of expenditure over the years, rising from 0.0009 billion in 2016-17 to reach its highest 0.01 billion, in 2022-23, declining further in the following years, reaching upto 0.0002 billion in 2025-26.

Projects under government order and other orders show an almost consistent trend over the years in expenditure, rising from 0.001 billion in 2016-17 to 0.002 billion in 2025-26, with no notably huge fluctuations. The provision of allocation in lieu of government order shows a similar pattern, with 0.0001 billion in 2017-18 and rising only upto 0.0002 billion in 2025-26.

4.2.9 Fund Allocation Within the Production Sector

Figure 4.17

Sum of Fund allocation by year and sector within the production sector



Source: Primary Data

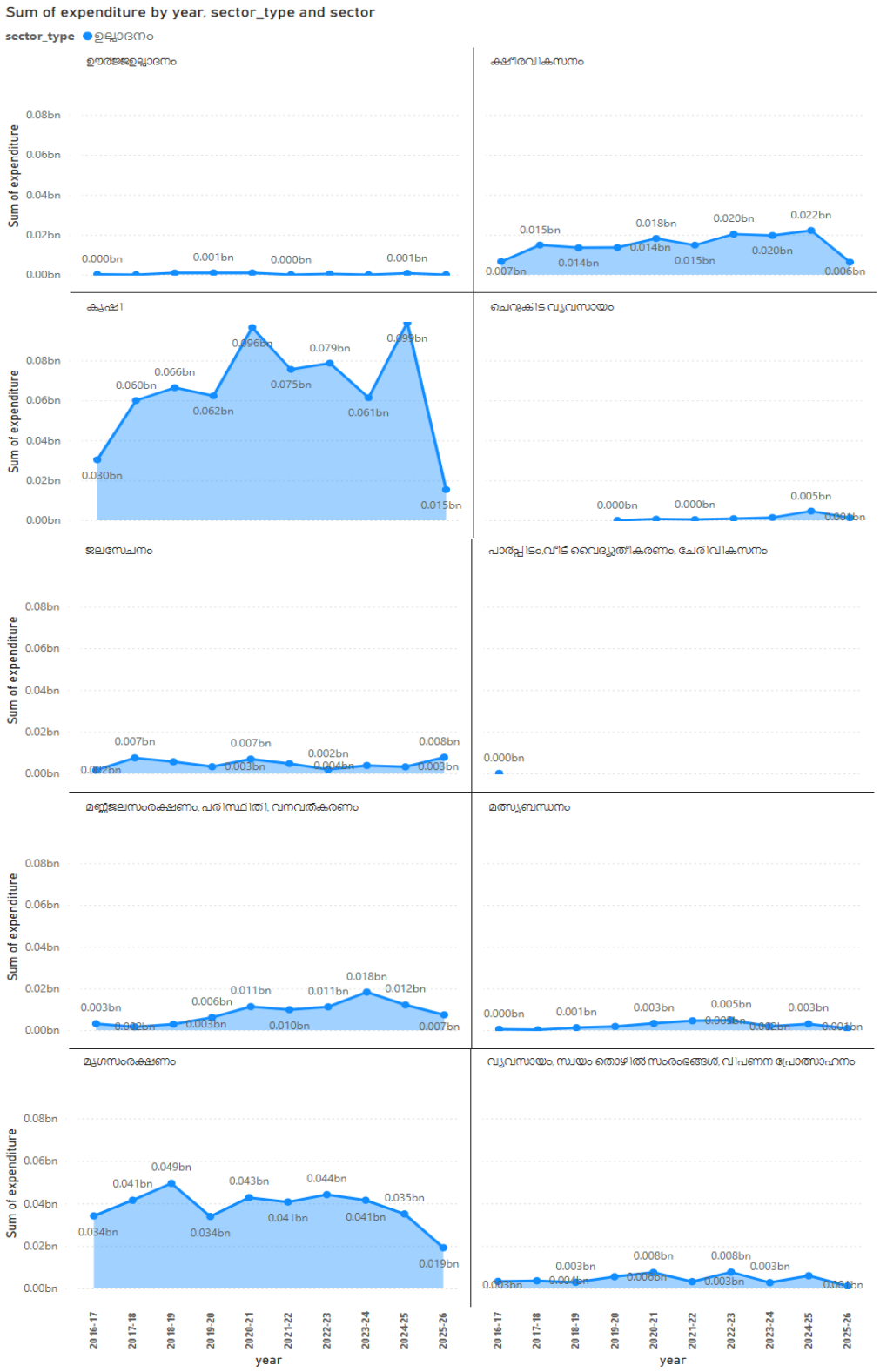
The figure 4.17 shows line graph indicating fund allocation trend within the production sector over the study period, 2016-17 upto 2025-26. We can see that the energy production sector remains almost consistent over the years, with allocating 0.001 billion in 2016-17, rising upto 0.004 billion in 2018-19, then declining in the following years to reach upto 0.001 billion in 2025-26. The dairy development sector shows an overall increasing trend in allocation, with 0.007 billion in 2016-17, then increasing consistently to reach upto 0.035 billion, its highest, in the year 2024-25, then declining slightly to 0.033 billion in the year 2025-26. The agriculture sector shows somewhat fluctuating trend in fund allocation, with 0.059 billion in 2016-17, increasing in the following years to reach upto 0.129 billion in 2020-21, then slightly declining in the next year 2021-22 (0.103 billion), then gradually increasing to reach its highest (0.142 billion) in 2024-25, then further declining in 2025-26 to reach 0.129 billion. The allocation in micro enterprises sector rises from 0.002 billion in 2019-20, rises to 0.003 billion in 2020-21, and remains constant until 2023-24, where it rises to 0.014 billion, and reaches its highest (0.027 billion) in 2024-25 and further declines in 2025-26 to 0.024 billion. The irrigation sector shows a very minutely fluctuating allocation, with rising from 0.009 billion in 2016-17 to reach upto 0.029 billion in 2021-22, then further declining in the following years to reach at 0.017 billion in 2025-26. Whereas, the housing, house electrification and slum development sector only shows 0.00002 billion allocated in the year 2016-17.

Soil and water conservation, environment, and afforestation sector shows an overall increase in allocation with minor fluctuations. It rises from 0.006 billion in 2016-17 and reaches 0.030 billion in 2020-21, sharply increases in 2021-22 to reach 0.078 billion, then steeply declines to 0.044 billion in 2022-23, then gradually rises to reach 0.062 billion in 2024-25 and then slightly declines to reach 0.060 billion in 2025-26. The allocation in fisheries sector gradually increases from 0.001 billion in 2016-17 to reach its highest, 0.022 billion in 2021-22, then further declines in the following years, reaching upto 0.005 billion in 2025-26.The allocation in animal protection sector rises from 0.060 billion in 2016-17 to 0.075 billion in 2018-19, then further declines to 0.064 billion in 2019-20, then increases further to 0.076 billion in 2020-21, then declining in the following years, reaching upto 0.055 billion in 2024-25, then further increasing to reach 0.068 billion in 2025-26. The industry, self-employment and marketing promotion sector shows a rather fluctuating allocation trend, being constant in the early years (0.020 billion), it slightly declines to 0.014 billion in 2018-19, then further increases in 2019-20 (0.019 billion), thereafter showing a declining trend, until it rises to 0.020 billion in 2022-23, and after some fluctuations, reaches 0.021 billion in 2025-26.

4.2.10 Fund Expenditure Within the Production Sector

Figure 4.18

Sum of Fund expenditure by year and sector within the production sector



Source: Primary Data

The figure 4.17 shows line graph indicating fund allocation trend within the production sector over the study period. We can see that the expenditure in the energy production sector remains almost consistent over the years, starting from 0.0002 billion in 2016-17, and reaches upto 0.001 billion in 2019-20, then further declines in the following years, and again reaches 0.001 billion in 2024-25. The dairy development sector shows a slightly fluctuating trend, starting from 0.007 billion in 2016-17 and reaches 0.015 billion in 2017-18, and grows almost consistently to reach 0.018 billion in 2020-21, and with some minor fluctuations, reaches 0.022 billion in 2024-25 and declines in 2025-26 to reach 0.006 billion. The expenditure in agriculture sector shows huge fluctuations, rising from 0.030 billion in 2016-17 to 0.062 billion in 2019-20, and rises to 0.096 billion in 2020-21, then declines in the following years, reaching upto 0.061 billion in 2023-24, then reaches its peak 0.099 billion in 2024-25 and then declines in 2025-26 and reaches 0.015 billion. The micro enterprise sector gradually rises from 0.0006 billion in 2020-21 to 0.005 billion in 2024-25 and declines to 0.001 billion in 2025-26.

The irrigation sector expenditure rises from 0.002 billion in 2016-17 and reaches 0.007 billion in two years 2017-18 and 2020-21 with some minor fluctuations in the years in between, then it further declines and then rises until it reaches its peak (0.008 billion) in 2025-26. The housing, house electrification and slum development sector records only 0.00002 billion in 2016-17. Soil and water conservation, environment, and afforestation sector shows an expenditure pattern rising gradually from 0.003 billion in 2016-17, and reaches 0.011 billion in 2020-21, then with minor fluctuations, it gradually rises to 0.018 billion in 2023-24 and declines in the following years, reaching upto 0.007 billion in 2025-26.

The fisheries sector shows a gradual increase in expenditure from 0.0004 billion to 0.005 billion in 2022-23, then with minor fluctuations in the following years, it declines upto 0.001 billion in 2025-26. The expenditure in animal protection sector shows a rather declining trend, rising from 0.034 billion in 2016-17, it reaches its peak (0.049 billion) in 2018-19 then declines to 0.034 billion in 2019-20, then rises to 0.043 billion in 2020-21, then shows a declining trend until 2025-26, where it shows its lowest expenditure, 0.019 billion.

The industry, self-employment and marketing promotion sector shows a rather fluctuating expenditure trend, rising from 0.003 billion in 2016-17 to 0.008 billion in 2020-21, then declining to 0.003 billion in 2021-22, then rising to 0.008 billion in 2022-23, then further declines with some minor fluctuations, reaching upto 0.001 billion in 2025-26.

4.3 Empirical Testing

This section presents the statistical analysis of regional and sectoral disparities within the Census Towns in Kerala during the period 2016-17 to 2025-26. The previous sections show the graphical representation of analysis of regional and sectoral trends, analysed using Power BI, and in this section, empirical testing is done to confirm that the observed differences are statistically significant.

The whole population of 461 Census Towns was classified into three regional stratas- North, Central, and South- based on the districts. Then, according to the number of Census Towns in each region, a total of 20 Census Towns from all three regions were selected using systematic random sampling. The number of samples from each region were determined using:

Number of Census Towns in particular region/ 461*20

Where 461 is the total number of Census Towns, and 20 is the total number of samples required.

The systematic random sampling was enabled by generating random numbers using the formula '=Randbetween' in the Microsoft Excel.

The analysis is undertaken in two aspects- first, analysing regional disparities among the three regions by comparing their allocation and expenditure. Next, sectoral disparities are examined by comparing allocation and expenditure data across production, infrastructure, and service sectors. The statistical significance was tested using Paired two sample t-test in the Microsoft Excel using a significance level of 5 percent, $\alpha = 0.05$. this test is appropriate as the data shows year-wise matched observations for each region over the study period, with a total of 30 observations. Such empirical method supports the analytical framework of the study since it goes beyond the descriptive interpretation and gives statistics to prove the findings based on the given information.

4.3.1 Inter-regional Analysis of fund allocation

To understand whether there are statistically significant inter-regional disparities in fund allocation among Census Towns in Kerala, paired two sample t-test using Microsoft Excel was conducted across the three regions: North, South, and Central using the data on fund allocation during the study period from 2016-17 to 2025-26. The test compares the mean differences between allocated funds across the three regions to examine the statistical significance of the differences.

Hypothesis Formulation

For understanding the regional disparity in fund allocation, the hypotheses formed are:

Null Hypothesis (H_0): There exists no significant difference in the mean fund allocation between the two regions.

Alternative Hypothesis (H_1): There exists significant difference in the mean fund allocation between the two regions.

Table 4.1: Paired two sample t-test for means, fund allocation- Central vs North

	Central	*North*
Mean	440477983.2	370441887.3
Variance	1.21415E+17	7.84091E+16
Observations	30	30
Pearson Correlation	0.975589717	
Hypothesized Mean Difference	0	
df	29	
t Stat	3.94688137	
P(T<=t) one-tail	0.000231026	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	0.000462052	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The result of the paired t-test in table 4.1 proves that the mean fund allocation of the Central region is greater than it is in the North region. The t-value of 3.947 is greater than 2.045, the

critical value at 5 percent level of significance. Moreover, the p-value (0.000462) is not greater than 0.05. the null hypothesis is therefore rejected. This means that the difference in fund allocation in the Central region and the Northern region is statistically significant. Results indicate that there is regional inequality in allocation among the two regions tested, Central and North.

Table 4.2: Paired two sample t-test for means, fund allocation- North vs South

	North	*South*
Mean	370441887.3	194920384.1
Variance	7.84091E+16	3.10449E+16
Observations	30	30
Pearson Correlation	0.951898331	
Hypothesized Mean Difference	0	
df	29	
t Stat	7.71565349	
P(T<=t) one-tail	8.26834E-09	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	1.65367E-08	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The results of the paired t-test in table 4.2 indicates that that the average amount of funds in the Northern region is significantly greater than that of the Southern region. The t-value that is calculated (7.716) is significantly more than the critical value (2.045) when considering the level of significance of five percent. Moreover, the p-value (1.65367E-08) is very small, and it is not equal to or less than 0.05. the null hypothesis is therefore rejected. This means that the difference in funds distributed in the Northern and the Southern regions was statistically significant during the study period. The size of the t-value implies that there is a strong regional difference in allocation patterns among Census Towns in these regions.

Table 4.3: Paired two sample t-test for means, fund allocation- Central vs South

	Central	*South*
Mean	440477983.2	194920384.1
Variance	1.21415E+17	3.10449E+16
Observations	30	30
Pearson Correlation	0.93087918	
Hypothesized Mean Difference	0	
df	29	
t Stat	6.885293468	
P(T<=t) one-tail	7.25644E-08	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	1.45129E-07	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The test outcomes of the paired t-test in table 4.3 indicates that mean fund allocation in the Central region is significant when compared to the Southern region. The t-value obtained (6.885) is higher than critical value (2.045) at 5 percent level of significance. In addition, the p-value(two-tail) (1.45129E-07) is significantly lower than 0,05. Thus, the null hypothesis has been rejected. This denotes that the amount of funds allocated in the Central and Southern regions during the period of study is statistically different, which shows a significant inter-regional imbalance in the patterns of allocation of Census Towns in Kerala.

Overall, the empirical findings indicate that there are statistically significant differences in fund allocation in all the three regions. The Central region has the highest mean allocation, followed by the northern region, while the Southern region shows comparatively lower allocation levels. The findings indicate that there is strong inter-regional disparity in fund allocation among the Census Towns in Kerala, during the study period.

4.3.2 Inter-regional Analysis of fund expenditure

To understand whether there are statistically significant inter-regional disparities in fund expenditure among the Census Towns in Kerala, paired two sample t-test using Microsoft Excel was conducted across the three regions: North, South, and Central using the data on fund expenditure during the study period from 2016-17 to 2025-26. The test compares the mean differences between expenditure of funds across the three regions to examine the statistical significance of the differences.

Hypothesis Formulation

For understanding the regional disparity in fund expenditure, the hypotheses formed are:

Null Hypothesis (H_0): There exists no significant difference in the mean fund expenditure between the two regions.

Alternative Hypothesis (H_1): There exists significant difference in the mean fund expenditure between the two regions.

Table 4.4: Paired two sample t-test for means, fund expenditure- Central vs North

	central	*north*
Mean	183385054.6	157637456.5
Variance	1.77529E+16	1.27782E+16
Observations	30	30
Pearson Correlation	0.968534477	
Hypothesized Mean Difference	0	
df	29	
t Stat	3.829939928	
P(T<=t) one-tail	0.000316786	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	0.000633573	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The paired t-test results in table 4.4 show that the mean amount of money spent on the fund expenditure in the Central region is more than the mean amount of money spent in the Northern region. The t-value (3.830) is more than the critical value (2.045) at 5 percentage level of significance. This implies that there is a statistically significant difference between expenditure on funds in the Central and Northern regions during the study period.

Table 4.5: Paired two sample t-test for means, fund expenditure- North vs South

	north	*south*
Mean	157637456.5	82817266.1
Variance	1.27782E+16	4.44085E+15
Observations	30	30
Pearson Correlation	0.941065063	
Hypothesized Mean Difference	0	
df	29	
t Stat	7.431464348	
P(T<=t) one-tail	1.72299E-08	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	3.44598E-08	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The results of the paired t-test from table 4.5 indicates that mean fund expenditure in the North is more than the mean fund expenditure in the South. The t-value of 7.431 is much larger than the critical value of 2.045 at 5 percent level of significance. Also, the t-test p-value (3.44598E-08) is way lesser than 0.05. Thus, the null hypothesis has been disproved. This indicates that the difference in the amount of funds spent in the North and the South region is is statistically significant, which indicates a strong inter-regional variation in the level of expenditure across Census Towns in Kerala.

Table 4.6: Paired two sample t-test for means, fund expenditure- Central vs South

	central	*south*
Mean	183385054.6	82817266.1
Variance	1.77529E+16	4.44085E+15
Observations	30	30
Pearson Correlation	0.947897516	
Hypothesized Mean Difference	0	
df	29	
t Stat	7.523220445	
P(T<=t) one-tail	1.35789E-08	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	2.71577E-08	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

According to the results of paired t-test in table 4.6, the mean fund expenditure in the Central region is significantly larger than in the South region. The t-value (7.523) is larger than than the critical value (2.045) with 5 percent level of significance. Also, the two-tailed p-value (2.71577E-08) is much lesser than 0.05, and as a result of all this, the null hypothesis will be rejected. This shows that there is a statistically significant difference between the amount of funds spent in the Central and South regions during the period of the study.

The empirical testing indicates that there is a statistically significant difference in the fund allocation and expenditure in all regional pairs. The Central region has the highest mean allocation and expenditure, when compared to the other two regions. The findings clearly indicate that there are high inter-regional variations in terms of financial allocation and expenditure in the Census Towns in Kerala during the study period from 2016-17 to 2025-26.

4.3.3 Inter-sectoral Analysis of fund allocation

To understand whether there are statistically significant inter-sectoral disparities in fund allocation among the Census Towns in Kerala, paired two sample t-test using Microsoft Excel was conducted across the three sectors: Production, Infrastructure and Services using the data on fund allocation during the study period from 2016-17 to 2025-26. The test compares the mean differences between allocation of funds across the three sector types to examine the statistical significance of the differences.

Hypotheses formulation:

Null hypothesis: There is no significant difference in mean fund allocation in the selected sectors.

Alternative hypothesis: There exists significant difference in mean fund allocation in the selected sectors.

Table 4.7: Paired two sample t-test for means, fund allocation- Production vs Infrastructure

	production	*infrastructure*
Mean	95453930.87	296070575.4
Variance	1.72438E+15	2.31295E+16
Observations	30	30
Pearson Correlation	0.903587423	
Hypothesized Mean Difference	0	
df	29	
t Stat	-9.477941815	
P(T<=t) one-tail	1.09792E-10	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	2.19584E-10	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The paired t-test results from table 4.7 indicates that the difference in the mean fund allocation between the production and infrastructure sectors is significant throughout the study period. Infrastructure sector has a much higher mean allocation when compared to that of the

production sector. The absolute t-value (9.478) is much higher than the critical value (2.045) at 5 percent level of significance. Also, the two-tailed p-value (2.19584E-10) is much less than 0.05. Thus, the null hypothesis is rejected. This proves that there exists statistically significant inter-sectoral inequality in case of fund allocation, with respect to production and infrastructure sectors.

Table 4.8: Paired two sample t-test for means, fund allocation- Infrastructure vs Services

	infrastructure	*services*
Mean	296070575.4	614315748.3
Variance	2.31295E+16	9.74867E+16
Observations	30	30
Pearson Correlation	0.736757193	
Hypothesized Mean Difference	0	
df	29	
t Stat	-7.7454681	
P(T<=t) one-tail	7.65978E-09	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	1.53196E-08	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The results of the paired t-test in table 4.8 show that the allocation of funds in the sectors of infrastructure and services sector is statistically significant. Service sector is much higher in mean allocation than the infrastructure sector. At the 5 percent level of significance, the absolute t-value (7.745) is much greater than the critical value 2.045. Moreover, the two-tailed p-value (1.53196E-08) is much lesser than 0.05. Therefore, the null hypothesis is rejected. And thus, there exists statistically significant inter-sectoral disparity in allocation with respect to infrastructure and service sector.

Table 4.9: Paired two sample t-test for means, fund allocation- Production vs Services

	production	*services*
Mean	95453930.87	614315748.3
Variance	1.72438E+15	9.74867E+16
Observations	30	30
Pearson Correlation	0.788879779	
Hypothesized Mean Difference	0	
df	29	
t Stat	-10.1268437	
P(T<=t) one-tail	2.47728E-11	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	4.95456E-11	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The paired t-test values in table 4.9 indicates that there exists a statistically significant difference in mean fund allocation in production and service sectors. The mean allocation of service sector is much greater than that of the production sector. The absolute value of the t-value (-10.127) is much greater than that of the critical value (2.045) at 5 percent level of significance. Also, the two-tailed p-value (4.95456E-11) is significantly lesser than 0.05. thus, the null hypothesis is rejected. This indicates the existence of statistically significant inter-sectoral disparity in allocation with respect to production and service sector.

The results of the conducted empirical testing indicate that there exists statistically significant variations in fund allocation among the major three sector types- production, infrastructure, and services. The Services sector has the highest allocation during the study period, which is followed by the infrastructure sector, and lastly, the production sector. The findings indicate that there is a trend of sectoral priorities in case of fund allocation in the Census Towns during the study period.

4.3.4 Inter-sectoral Analysis of fund expenditure

To understand whether there are statistically significant inter-sectoral disparities in fund expenditure among the Census Towns in Kerala, paired two sample t-test using Microsoft Excel was conducted across the three sectors: Production, Infrastructure and Services using the data on fund expenditure during the study period from 2016-17 to 2025-26. The test compares the mean differences between expenditure of funds across the three sector types to analyse the statistical significance of the differences.

Hypotheses formulation:

Null hypothesis: There is no significant difference in mean fund expenditure in the selected sectors.

Alternative hypothesis: There exists significant difference in mean fund expenditure in the selected sectors

Table 4.10: Paired two sample t-test for means, fund expenditure- Production vs Infrastructure

	production	*infrastructure*
Mean	46218533.1	128260431.5
Variance	5.25184E+14	4.77316E+15
Observations	30	30
Pearson Correlation	0.867556975	
Hypothesized Mean Difference	0	
df	29	
t Stat	-8.89666106	
P(T<=t) one-tail	4.36625E-10	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	8.73251E-10	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The results of the paired sample t-test indicates that there is a statistically significant difference in mean fund expenditure between production and infrastructure sectors. The mean expenditure

on the infrastructure sector is significantly higher than that of the production setor. The t-value in absolute terms, 8.897 is much higher than the critical value, 2.045 at 5 percent level of significance. In addition, the two-tailed p-value (8.73251E-10) is much lesser than 0.05. Thus, the null hypothesis is rejected. Thus, there exists inter-sectoral disparity among the production and infrastructure sectors in terms of expenditure.

Table 4.11: Paired two sample t-test for means, fund expenditure- Infrastructure vs Services

	infrastructure	*services*
Mean	128260431.5	249360812.6
Variance	4.77316E+15	1.37121E+16
Observations	30	30
Pearson Correlation	0.658350621	
Hypothesized Mean Difference	0	
df	29	
t Stat	-7.49448148	
P(T<=t) one-tail	1.46288E-08	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	2.92576E-08	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

In the table 4.10, the result of the paired two sample t-test shows that the difference in the mean expenditure of funds within the infrastructure and service sectors are statistically significant. The service sector has a significantly higher mean expenditure than the infrastructure sector. The absolute t-value (7.494) is greater than the critical value (2.045) in absolute values, at a 5 percent level of significance. Also, the two-tailed p-value (2.92576E-08) is much lower than 0.05. Thus the null hypothesis is rejected. Thus, there exists inter-sectoral disparity among the infrastructure and the service sectors in terms of expenditure.

Table 4.12: Paired two sample t-test for means, fund expenditure- Production vs Services

	production	*services*
Mean	46218533.1	249360812.6
Variance	5.25184E+14	1.37121E+16
Observations	30	30
Pearson Correlation	0.79730516	
Hypothesized Mean Difference	0	
df	29	
t Stat	-11.1499304	
P(T<=t) one-tail	2.64139E-12	
t Critical one-tail	1.699127027	
P(T<=t) two-tail	5.28279E-12	
t Critical two-tail	2.045229642	

Note: Paired two Sample t-test for Means, computed using Microsoft excel

The paired t-test findings in table 4.12 indicate a statistically significant difference in the mean values fund expenditure in the production and service sector. Mean expenditure is much greater in service sector than in the production sector. The absolute t-value (11.150) is less than the critical value (2.045) obtained in absolute terms at 5 percent level of significance. Also, the two-tailed p-value (5.28279E-12) is way lesser than 0.05. Thus, the null hypothesis is not accepted.

The empirical test results indicate that there exists statistically significant disparities in expenditure among all the three major sector types- production, infrastructure, and services. Among which, the service sector takes the first place in terms of average expenditure every year. Which is followed by the infrastructure sector, whereas the production sector has the lowest rates of fund expenditure. The expenditure pattern is somewhat similar to the allocation pattern, suggesting that the Census Towns clearly have sectoral prioritisation in terms of allocation and expenditure during the study period.

CHAPTER 5

FINDINGS, CONCLUSION AND POLICY IMPLICATIONS

5.1 Major findings of the study

This study has analysed regional and sectoral disparities in fund allocation and expenditure across selected Census Towns in Kerala during the period 2016-17 to 2025-26. Based on pie chart, bar chart, and line graphs created using Power BI visualisation tools and empirical testing using paired two sample t-test for means, by Microsoft Excel, the following findings have been derived.

5.1.1 Regional disparities in fund allocation and expenditure

The findings of the empirical tests prove that there exists statistically significant inter-regional differences in fund allocation between the regions in Kerala, mainly- North, Central, and South. We can see from the test results, also from the bar charts that the Central region always has the highest allocation, followed by the North, and then the South region having the relatively lower allocations. The t-test results of all inter-regional comparisons were statistically significant at the the 5 percent level of significance. This implies that the allocation of funds among the Census Towns in Kerala is uneven among the regions.

Similar to the pattern of allocation, the expenditure pattern also shows statistically significant regional inequalities. The Central region has the highest mean expenditure, which is followed by the Northern region, then the Southern region which has the least expenditure. These differences are statistically significant, which confirms the existence of disparities amongst the region in terms of allocation as well as expenditure. Which also is indicative of the relation between allocation and expenditure that an increase in allocation also shows an increase in expenditure.

5.1.2 Sectoral disparities in fund allocation and expenditure

The sectoral analysis shows that there exists clear sectoral priorities for allocation among the production, infrastructure, and service sectors. In this case, the service sector has received the highest allocations during the study period. Which is followed by the infrastructure sector, then the production sector, which has the lowest allocation of funds. The statistical significance of all the paired t-test results among the sectors were above the 5 percent level of significance.

This shows that the Census Towns fund allocation is mainly service-oriented, but with a relatively less focus on activities related to production.

The structure of fund allocation in Census Towns is also reflected in its expenditure pattern. The highest mean expenditure occurred in Service sector, followed by the infrastructure sector, and lastly, the service sector. The comparative analysis of all sectoral expenditure in terms of its statistical significance supports the existence of strong inter-sectoral differences in fund expenditure. It indicates that there is an increased focus on development in the chosen sectors.

5.2 Conclusion

The study aimed to investigate the presence of major regional and sectoral disparities in fund allocation and expenditure within the Census Towns of Kerala during the study period, from 2016-17 to 2025-26. The empirical tests clearly proves the inter-regional and inter-sectoral disparities in fund allocation and expenditure.

At the regional level, the Central region is relatively higher in both allocation and expenditure, when compared to the Southern region which has the lowest values, which indicates spatial inequality in fund allocation and expenditure.

At the sectoral level, service sector has the highest allocation and expenditure, followed by the infrastructure, then the production sector which has the lowest. This indicates that the fund allocation and expenditure patterns are more focused on service provision and infrastructure development, when compared to the production sector.

The financial situation od Census Towns in Kerala during the study period indicates imbalances that need to be tackled so that more effective and balanced regional development in emerging urban spaces is achieved.

5.3 Policy Implications

The findings have the following implications on policy:

- Increased balance of inter-regional fiscal allocation is needed in order to reduce spatial inequalities among the Census Towns in Kerala.
- The production sector needs to be given much more priority to facilitate a sustainable economic growth and employment generation.
- The method through which funds are allocated should be periodically evaluated so that funds are equitably allocated.

BIBLIOGRAPHY

1. Samanta, G. (2014). The politics of classification and the complexity of governance in census towns. *Economic and Political Weekly*, 55-62.
2. Nijman, J., Van Duijne, R. J., & Choithani, C. (2025). Urbanization and social change in rural India. *Urban Studies*, 00420980251364677.
3. Rawat, S. (2025). Does Urban Local Governance Matter? Evidence from India. *arXiv preprint arXiv:2511.06562*.
4. Mitra, A., & Kumar, R. (2015). New patterns in Indian urbanization: Emergence of census towns. *Environment and Urbanization ASIA*, *6*(1), 18-27.
5. Sahu, M. A. N. O. J., Das, K. C., & Bhuyan, B. I. B. H. I. S. H. A. N. A. (2019). Role of census towns in rising urbanisation of India. *Nagarlok*, *1*(Part-4), 1-14.
6. Pradhan, K. C. (2017). Unacknowledged urbanisation: The new census towns in India. In *Subaltern urbanisation in India: An introduction to the dynamics of ordinary towns* (pp. 39-66). New Delhi: Springer India.
7. Kanhu Charan, P., & Kanhu, P. (2013). Unacknowledged Urbanisation: The New Census Towns of India. *MPRA Paper*.
8. Roy, S. N., & Pradhan, K. C. (2018). Census Towns in India. *Delhi, India: Centre for Policy Research*.
9. Kuruvilla, K. (2014). Census towns in Kerala: Challenges of urban transformation. *Research notebooks, School of Habitat Studies*, 1-12.
10. Chakraborty, S. (2024). Decoding India's Mysterious Urbanisation. *Economic and Political Weekly*, *59*, 13-16.
11. Sircar, S. (2017). 'Census Towns' in India and what it means to be 'urban': Competing epistemologies and potential new approaches. *Singapore Journal of Tropical Geography*, *38*(2), 229-244.
12. Sircar, S. (2018). "You can call it a Mufassil Town, but nothing less": Worlding the new census towns of India. *Geoforum*, *91*, 216-226.
13. Guin, D. (2018). From large villages to small towns: A study of rural transformation in new census towns, India. *International Journal of Rural Management*, *14*(2), 87-109.
14. Chakrabarti, S. (2022). Growth of census towns in India: an economic analysis.
15. Sridharan, N., & Chakrabarti, A. GROWTH OF CENSUS TOWNS IN AGRO-CLIMATIC ZONES IN INDIA.
16. Chakrabarti, S., & Mukherjee, V. (2020). Birth of census towns in India: an economic analysis. *South Asian Journal of Macroeconomics and Public Finance*, *9*(2), 139-166.
17. Das, K. C. (2017). The growing number and size of towns/cities in India: Emerging issues from 2011 census data. *International Union for the Scientific Study of Population, viewed on*, *31*.
18. Chakrabarti, S., & Mukherjee, V. (2022). Role of transport infrastructure in birth of census towns in West Bengal. *Asia-Pacific Journal of Regional Science*, *6*(2), 593-616.
19. Karmakar, J. (2015). Emergence of census towns and its socio-economic condition: Case of West Bengal. *Growth*, *6*(7.02), 21-03.
20. Ghosh, Pijus Kanti, and Sahina Khatun. "Statutory vs census towns: modeling the differences of urban development using statistical approach in India: a micro level case analysis." *Modeling Earth Systems and Environment* 8, no. 1 (2022): 435-448.
21. Mitra, A., & Tripathi, S. (2021). Rural non-farm sector: revisiting the census towns. *Environment and Urbanization ASIA*, *12*(1), 148-155.

22. https://spb.kerala.gov.in/economic-review/ER2017/web_e/ch11.php?id=1&ch=11
23. https://keralaeconomy.com/admin/pdfs/Population%20in%20Kerala111.pdf