

## SPATIAL TEMPORAL PATTERN OF URBANIZATION IN FAR- WEST PROVINCE OF NEPAL

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### ABSTRACT

*This study, titled Spatial Temporal Pattern of Urbanization in Far-West Province of Nepal aims to analyze the spatial and temporal trends of urbanization in the region, focusing on changes in urban population distribution and the factors driving these changes. Utilizing secondary data from the Central Bureau of Statistics of Nepal, covering the period from 1981 to 2021, the study employs tables, line graphs, and maps to illustrate urban growth patterns. The findings reveal a significant increase in the urban population from 71,108 in 1981 to 1,682,578 in 2021, with the number of urban centers rising from 2 to 34. The Terai region, particularly the districts of Kailali and Kanchanpur, shows the highest urbanization rates, while the Mountain and Hill regions have lower rates. The study concludes that rapid and uneven urbanization in the Far-west Province is driven by governmental policies and rural-to-urban migration, highlighting the need for effective urban planning and resource allocation to manage the associated challenges and opportunities.*

**Key Words:** *Urbanization, Spatial, Temporal, Pattern, Far-west*

### INTRODUCTION

Urbanization is a complex process that involves the growth and expansion of urban areas over time. From a spatial-temporal perspective, urbanization trends can be analyzed by examining the changes in the spatial distribution of urban areas and the temporal patterns of urban growth. This approach helps in understanding how cities evolve, the factors driving their expansion, and the implications for development. Spatial-

temporal analysis of urbanization involves studying the spatial patterns of urban growth and how these patterns change over time. This includes the examination of land use changes, the expansion of built-up areas, and the transformation of rural areas into urban spaces. By using various quantitative methods, such as remote sensing and geographic information systems (GIS), researchers can map and analyze these changes to identify trends and patterns (Shreshtha et al., 2024). For instance, the growth of urban areas can be mapped to show how cities expand outward from their centers, often forming sprawling suburbs and exurbs.

Urbanization has dramatically reshaped the global landscape over the past few decades. The global urban population has surged from 0.75 billion in 1950 to over 4 billion today, with projections indicating that more than two-thirds of the world's population will reside in urban areas by 2050. Historically, urbanization was concentrated in Europe and North America, but the epicenter has shifted to Asia and Africa, where cities are expanding at unprecedented rates. This rapid urban growth presents significant challenges, including food security, poverty, and access to housing and basic amenities. Additionally, climate change and the need for sustainable development are critical issues that urban policies must address. The spatial pattern of urbanization now shows a concentration of mega and large cities in Asia and Africa, while some cities in North America and Europe are experiencing population declines. Looking ahead, small- and medium-sized cities in Asia and Africa are expected to see significant growth, further emphasizing the dynamic nature of urbanization and the need for effective urban planning and policies to manage these changes.

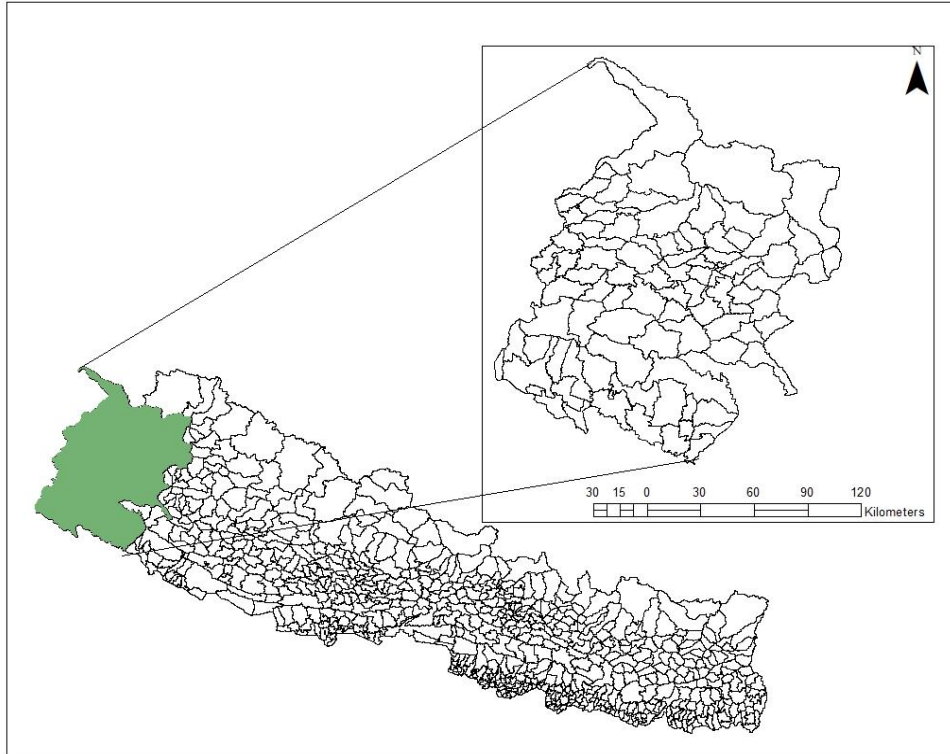
Urbanization in Nepal has been marked by significant spatial and temporal changes, particularly in the Kathmandu Valley. Over the past few decades, Nepal has transitioned from a predominantly rural society to an increasingly urban one. The urban population growth rate nearly doubled from 3.6% in 1991 to 6.5% in 2001, and the number of urban centers increased from 58 in 2013 to 293 in 2017 (Timsina et al., 2020). This rapid urbanization is driven by governmental decisions to merge rural administrative units into municipalities and by rural-to-urban migration (Timsina et al., 2020).

Kathmandu Valley, the hub of urbanization in Nepal, exemplifies these trends. The valley's population is growing at an annual rate of 6.5%, making it one of the fastest-growing metropolitan areas in South Asia (Timsina et al., 2020). The urbanization process in the valley has led to fragmented and heterogeneous land use patterns, with significant shifts from agricultural to built-up areas (Thapa & Murayama, 2009). This rapid growth has also resulted in challenges such as unplanned land use, shrinking open spaces, and inadequate urban services (Timsina et al., 2020).

Overall, Nepal's urbanization is characterized by a dynamic spatial pattern, with significant growth in both the core and fringe areas of cities like Kathmandu. Effective urban planning and policies are essential to manage these changes and address the associated challenges. This study analyzes the spatial and temporal trends of urbanization in the Far-west Provinces of Nepal.

## **METHODS AND MATERIALS**

This study concentrated in far-west province of Nepal. The Far West Province of Nepal, also known as Sudurpashchim Pradesh, is located in the westernmost part of the country. This region is known for its diverse geography, ranging from the lowland Terai plains to the high Himalayan. It comprises nine districts: Kailali, Kanchanpur, Dadeldhura, Doti, Achham, Bajura, Bajhang, Baitadi, and Darchula. The provincial capital is Godawari, located in Kailali district. The Far West Province covers an area of approximately 19,539 square kilometers and has a population of around 2.7 million people (CBS, 2021). The Far West Province of Nepal is experiencing notable urbanization trends, particularly in districts like Kailali and Kanchanpur. These areas have become urban hubs due to their strategic locations near major highways and the Indian border, facilitating trade and migration. This study is based on secondary data of central bureau statistic of Nepal form 1981 to 2021. Table, line graphs and maps has been used to present and analyze data.



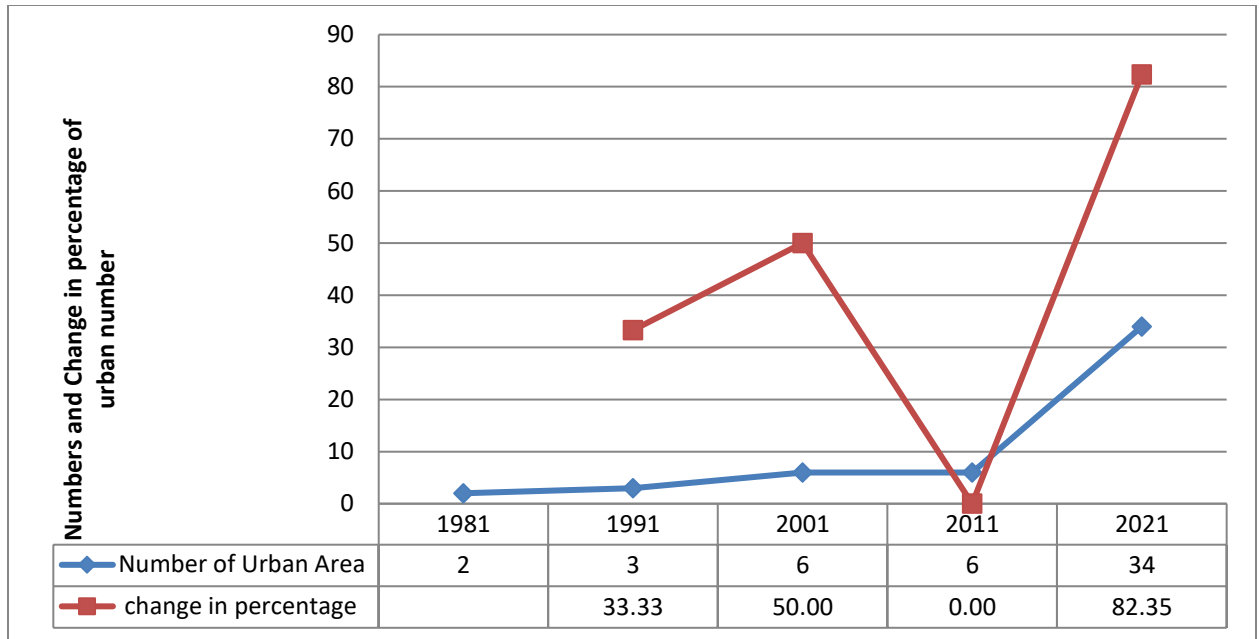
**Figure 1:** Study Area (Far-west Province of Nepal)

## RESULT AND DISCUSSION

Urbanization in the Far west Province of Nepal is a dynamic process influenced by various spatial and temporal factors. This region has seen significant urban growth over the past few decades.

### Temporal Trends of Urbanization in Far-west province of Nepal

The temporal aspect of urbanization in the Far-west Province shows a significant increase in urban population and the number of urban centers over time. From 1981 to 2021, the urban population in this region grew from 71,108 to 1682578 while the number of urban centers increased from 2 to 34. The following figures and table shows temporal trends of urbanization of far west province.



**Figure 2:** Urban center trends in Far-west Province

Source: CBS, 1981, 1991, 2001, 2011, 2021

The above figure 1 shows that the Far-west Province of Nepal has experienced significant urban growth over the past few decades. In 1981, there were only 2 urban areas in the province. By 1991, this number had increased to 3, marking a 33.33% growth. The most substantial growth occurred between 2001 and 2021. In 2001, the number of urban areas doubled to 6, representing a 50% increase from 1991. However, there was no change in the number of urban areas between 2001 and 2011. The most dramatic increase happened between 2011 and 2021, with the number of urban areas rising to 34, an 82.35% increase. This rapid urbanization reflects broader national trends driven by governmental policies to merge rural administrative units into municipalities and by rural-to-urban migration. But globally, urbanization has been a consistent trend, with the urban population growing from 30% in 1950 to 56% in 2020.

**Table 1**

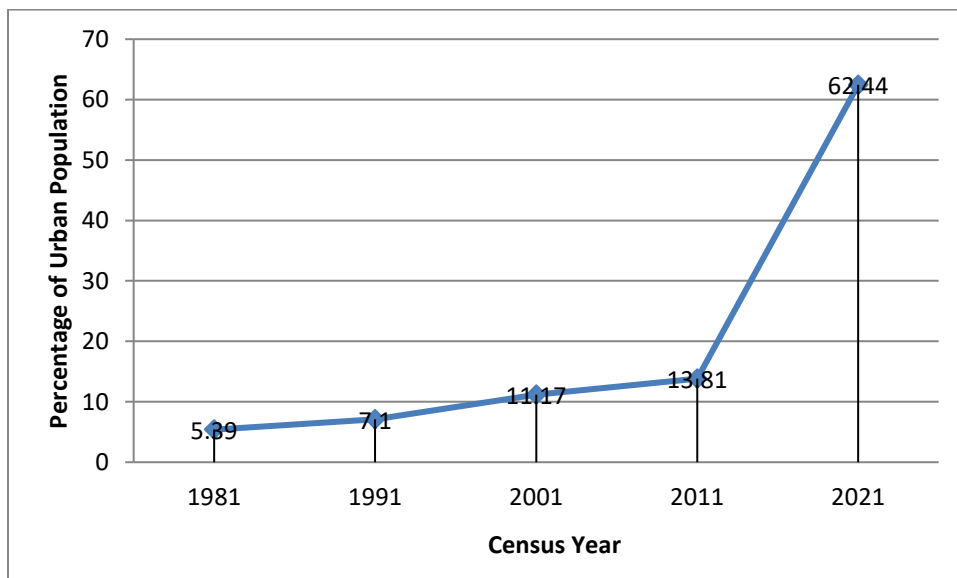
*Urban population trends in Far-west province of Nepal*

Population Census	Total Population	Urban Population	Percentage Of Urban Population
1981	1320089	71108	5.39

1991	1679301	119163	7.10
2001	2183175	243805	11.17
2011	2417605	333872	13.81
2021	2694783	1682578	62.44

Source: CBS, 1981, 1991, 2001, 2011, 2021

The urban population trends in the Far-west Province of Nepal have shown a remarkable increase over the past four decades. In 1981, the total population was 1,320,089, with an urban population of 71,108, accounting for 5.39% of the total population. By 1991, the total population had grown to 1,679,301, and the urban population had increased to 119,163, making up 7.10% of the total population. The decade from 1991 to 2001 saw a significant rise in urbanization, with the total population reaching 2,183,175 and the urban population more than doubling to 243,805, which was 11.17% of the total population. This trend continued into 2011, with the total population at 2,417,605 and the urban population at 333,872, representing 13.81% of the total population. The most dramatic change occurred between 2011 and 2021, when the total population increased to 2,694,783, and the urban population surged to 1,682,578, accounting for 62.44% of the total population. This rapid urbanization reflects significant socio-economic changes and governmental policies aimed at urban development, highlighting the need for effective urban planning to manage the challenges associated with such rapid growth.



**Figure 3:** Percentage of Urban Population of Far-west Province

This rapid growth is attributed to both natural population increase and migration from rural areas in search of better economic opportunities and living conditions. The development of infrastructure, such as roads and public services, has also played a crucial role in supporting this urban expansion.

**Spatial Patterns of Urbanization in Far-West Province in Nepal**

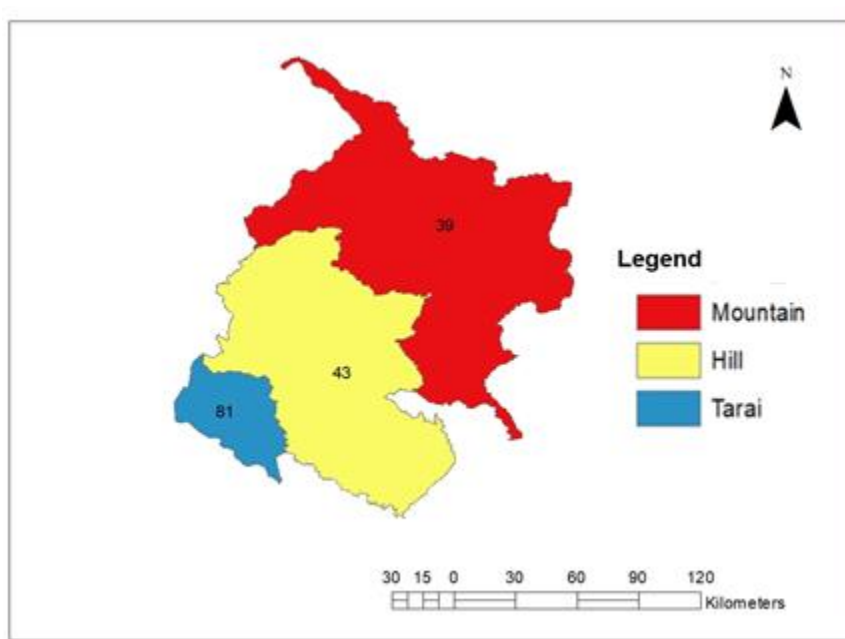
The spatial distribution of urbanization in the Far-west Province is uneven. Urban growth is concentrated in the Terai region, particularly in Kailali and Kanchanpur districts, which serve as hubs of urbanization.

**Table 3**

*Urban Population Distribution by Ecological Region of Far West Province of Nepal*

Ecological region	Total Population	Urban Population	Percentage of Urban Population
Mountain	460918	179421	38.93
Hill	815442	348985	42.80
Tarai	1418423	1154213	81.37

Source: CBS, 2021



**Figure 4:** Ecological Region-wise Population percentage of Urban Area of Far-west Province

The spatial distribution of the urban population in the Far-west Province of Nepal varies significantly across its three ecological regions: Mountain, Hill, and Tarai. The Mountain region, with a total population of 460,918, has an urban population of 179,421, which constitutes 38.93% of its total population. The Hill region, with a total population of 815,442, has a slightly higher urban population of 348,985, representing 42.80% of its total population. The Tarai region, however, stands out with the highest urbanization rate. Out of a total population of 1,418,423, a substantial 1,154,213 people, or 81.37%, reside in urban areas. This stark contrast highlights the significant urban concentration in the Tarai region compared to the Mountain and Hill regions. The higher urbanization rate in the Tarai can be attributed to factors such as better infrastructure, more economic opportunities, and favorable living conditions, which attract more people to urban centers in this region. This spatial analysis underscores the need for region-specific urban planning and development strategies to address the unique challenges and opportunities in each ecological zone.

**Table 4**

*Ecological region-wise Urban Number of Far-west Province*

Ecological region	Total number of Urban
Mountain	8
Hill	12
Tarai	14

Source: CBS, 2021

The Far West Province of Nepal shows distinct patterns in urban population distribution across its ecological regions. The Tarai region, with a total of 14 urban areas, has the highest number of urban centers, reflecting its relatively flat terrain and better accessibility, which likely contribute to higher urbanization. The Hill region follows with 12 urban areas, indicating a moderate level of urban development despite its more challenging terrain. The Mountain region, with only 8 urban areas, has the least urbanization, which can be attributed to its rugged landscape and harsher living conditions. This spatial analysis highlights the influence of geographical features on



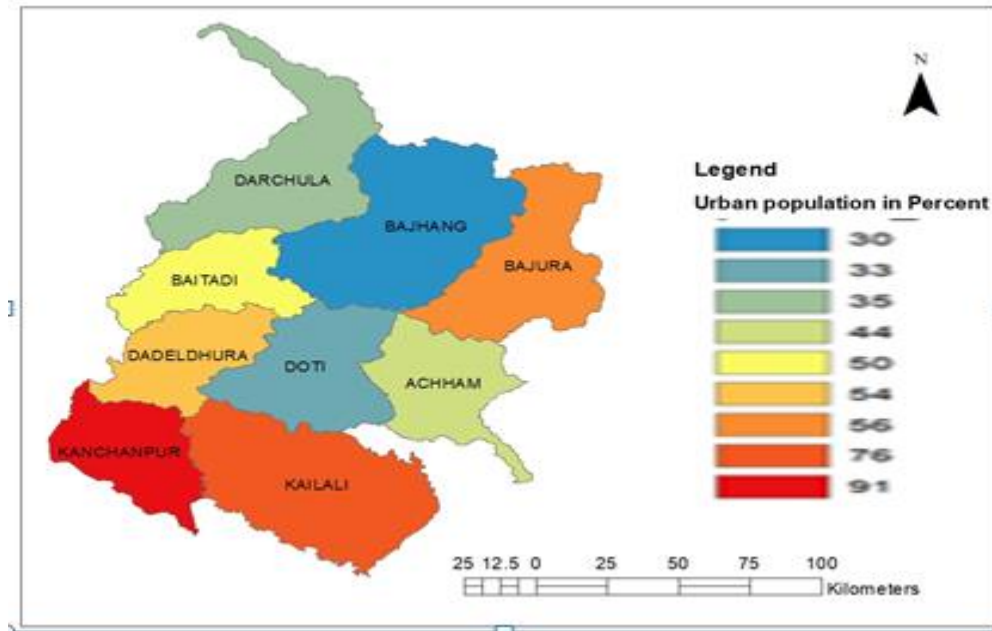
urban development, with more accessible and hospitable regions like the Tarai experiencing greater urban growth compared to the more challenging Hill and Mountain regions.

**Table 5**

*Urban Population Distribution of Far West Province by District In 2021*

Districts	Total Population	Urban Population	Percentage of Urban Population
Bajura	138523	76968	55.56
Bajhang	189085	56004	29.62
Darchuula	133310	46449	34.84
Baitadi	242157	120426	49.73
Dadeldhura	139602	60756	43.52
Doti	204831	67147	32.78
Achham	228852	100656	43.98
Kailali	904666	687424	75.99
Kanchanpur	513757	466789	90.86
Total	2694783	1682619	62.44

Source: CBS, 2021



**Figure 5:** District-wise Percentage of urban area of Far-west Province of Nepal

The spatial distribution of the urban population across the districts of the Far-west Province of Nepal in 2021 reveals significant variations. Kanchanpur district exhibits the

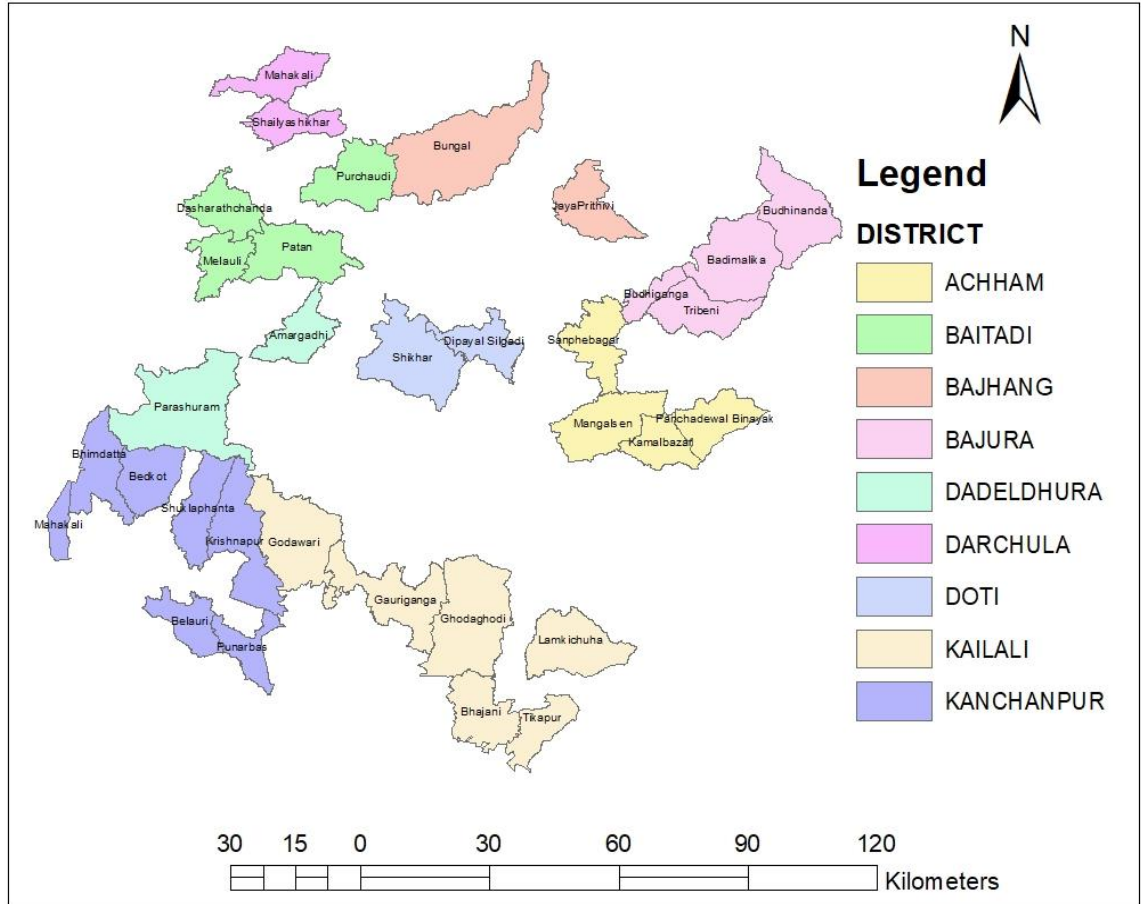
highest urbanization rate, with 90.86% of its total population of 513,757 living in urban areas. This is followed by Kailali, where 75.99% of its 904,666 residents are urban dwellers. Bajura also shows a high urbanization rate of 55.56%, with 76,968 out of 138,523 people living in urban areas. In contrast, Bhajhang has the lowest urbanization rate at 29.62%, with only 56,004 of its 189,085 residents living in urban areas. Other districts like Baitadi, Dadeldhura, and Achham have moderate urbanization rates of 49.73%, 43.52%, and 43.98%, respectively. Darchula and Doti have urbanization rates of 34.84% and 32.78%, respectively. Overall, the total urban population of the Far-west Province stands at 1,682,619, which is 62.44% of the total population of 2,694,783. In the context of Nepal, there are 66.17 percent living in urban area (CBS, 2021). This spatial analysis highlights the uneven distribution of urbanization across the province, with certain districts like Kanchanpur and Kailali experiencing much higher urban growth compared to others. This disparity underscores the need for targeted urban planning and resource allocation to address the unique needs and challenges of each district.

**Table 6**

*District-wise urban number distribution of Far-west Province of Nepal*

Districts	Total Municipality
Bajura	4
Bhajhang	2
Darchula	2
Baitadi	4
Dadeldhura	2
Doti	2
Achham	4
Kailali	7
Kanchanpur	7
Total	34

Source: CBS,2021



**Figure 6:** District-wise Municipalities of Far-west Province of Nepal

The urban number distribution across the districts of the Far West Province of Nepal reveals notable differences in the level of urbanization. The total number of municipalities in the province is 34, with significant variation among the districts.

Kailali and Kanchanpur lead with the highest numbers of municipalities, each has 7. This indicates a higher degree of urban development and possibly better infrastructure and services compared to other districts. These districts are likely more urbanized, reflecting their strategic importance and possibly more favorable geographical conditions.

Bajura, Baitadi, and Achham each have 4 municipalities, showing a moderate level of urbanization. These districts might be in a transitional phase, balancing between rural and urban characteristics.

Bhajhang, Darchula, Dadeldhura, and Doti have the lowest number of municipalities, with only 2 each. This suggests that these districts are less urbanized, possibly due to more challenging geographical conditions, limited infrastructure, or other socio-economic factors.

In summary, the spatial analysis highlights a clear disparity in urban development within the Far West Province, with Kailali and Kanchanpur being the most urbanized, while Bhajhang, Darchula, Dadeldhura, and Doti lag behind. This information is crucial for targeted urban planning and resource allocation to promote balanced regional development.

**Table 7**

*Population Density in Urban Area of Far West Province in Nepal*

Districts	Urban Population	Total Area	Population density in urban area
Bajura	76968	738	104.29
Bhajhang	56004	614.38	91.16
Darchula	46449	252.92	183.65
Baitadi	120426	672.36	179.11
Dadeldhura	60756	553.4	109.79
Doti	67147	411.99	162.98
Achham	100656	655.38	153.58
Kailali	687424	1689.44	406.89
Kanchanpur	466789	1015.64	459.60
Total	1682619	6603.51	254.81

Source: CBS, 2021

The urban areas of the Far West Province of Nepal exhibit significant variation in population density across its districts. The overall population density in these urban areas is 254.81 people per square kilometer, with a total urban population of 1,682,619 spread over an area of 6,603.51 square kilometers. In the context of Nepal, the population density of municipalities is 373 people per square kilometer (CBS, 2021).

Kanchanpur and Kailali stand out with the highest population densities of 459.60 and 406.89 people per square kilometer, respectively. These figures suggest that these districts are more urbanized and possibly more developed, with a higher concentration of

people in urban areas. On the other hand, Bhajhang and Bajura have the lowest population densities, at 91.16 and 104.29 people per square kilometer, respectively, indicating less urbanization and potentially more rural characteristics.

Districts like Darchula, Baitadi, Doti, and Achham show moderate population densities ranging from 153.58 to 183.65 people per square kilometer, reflecting a balanced level of urbanization. Dadeldhura also falls into this category with a density of 109.79 people per square kilometer.

This spatial analysis highlights the diversity in urban population distribution within the Far West Province, which is crucial for urban planning and resource allocation. The higher density areas may require more infrastructure and services to support the concentrated population, while the lower density areas might focus on development strategies to enhance urbanization and improve living standards.

### **Conclusion**

In conclusion, the Far-west Province of Nepal has experienced rapid and uneven urbanization over the past four decades, driven by governmental policies and rural-to-urban migration. The Tarai region, particularly Kailali and Kanchanpur, has seen the highest urbanization rates due to better infrastructure and economic opportunities. In contrast, the Mountain and Hill regions have lower urbanization rates. This disparity highlights the need for targeted urban planning and resource allocation to address the unique challenges of each district, ensuring balanced and sustainable urban development across the province. Effective urban planning is essential to manage the rapid growth and to provide adequate infrastructure, housing, and services to the growing urban population.

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