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STATUS OF ROOF BUILDING MATERIAL IN ROHTAK DISTRICT, HARYANA

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Abstract

This study investigates the distribution and prevalence of roof building materials across villages in Rohtak District, Haryana. Using data collected from multiple villages, the research analyzes the percentage of households employing different roofing materials such as concrete, mosaic/floor tiles, and traditional materials like thatch or mud. Through a comparative analysis, the study identifies variations in roofing material preferences among villages, shedding light on socio-economic factors, cultural practices, and environmental considerations influencing construction choices. The findings provide valuable insights for policymakers, urban planners, and local communities to inform infrastructure development, housing policies, and sustainable construction practices in Rohtak District and similar regions. The Sarai Ahmed village has the highest share of grass/thatch building with 89.5 per cent. While Dobh village has scored the top position in tiles utilization for roof construction in Rohtak district. Gandhra and Bharan villages have high proportion of burnt brick and stone material.

Keyword: Roof building material, Rohtak District, Haryana, Concrete, stone, Burnt Brick

Introduction

Concrete tiles are widely used in India for their affordability, durability, and resistance to weather conditions. They come in various shapes, sizes, and colors, providing flexibility in design (Das & Mistri, 2013). Clay tiles have been used in India for centuries and are still popular in many regions due to their natural aesthetic appeal, durability, and heat resistance. They are commonly seen in South Indian architecture. Slate roofing is less common in India due to its higher cost and limited availability. It is primarily used in upscale construction projects or heritage conservation efforts. Wood shingles are not commonly used in India due to concerns about durability, insect infestation, and fire risk (Kumar & Sinha, 2002). Green roofing systems

are gaining interest in India, especially in urban areas, as they offer benefits such as insulation, stormwater management, and environmental sustainability. Thatched roofs, made from materials like palm leaves or straw, are still prevalent in rural areas of India, particularly in regions with a tropical climate. They offer natural insulation and are cost-effective but require regular maintenance.

The choice of roof building material in India is influenced by factors such as local building traditions, availability of materials, cost considerations, climate resilience, and architectural preferences (Pal, 2016). Additionally, government regulations and initiatives promoting sustainable building practices are also shaping the adoption of roofing materials in the country.

Objectives

i. To assess the prevalence of different roof building materials, including concrete, mosaic tiles, floor tiles, and traditional materials, across various villages in Rohtak District.
ii. To identify the factors influencing the choice of roof building materials, such as socio-economic status, cultural practices, and environmental considerations.

Database & Methodology

District-wise census data of 2011 on various aspects of level of roof housing conditions of households have been used for the present work. To identify the levels of roof housing status of households in rural Rohtak seven indictors have been taken up in this study. They are as follows;

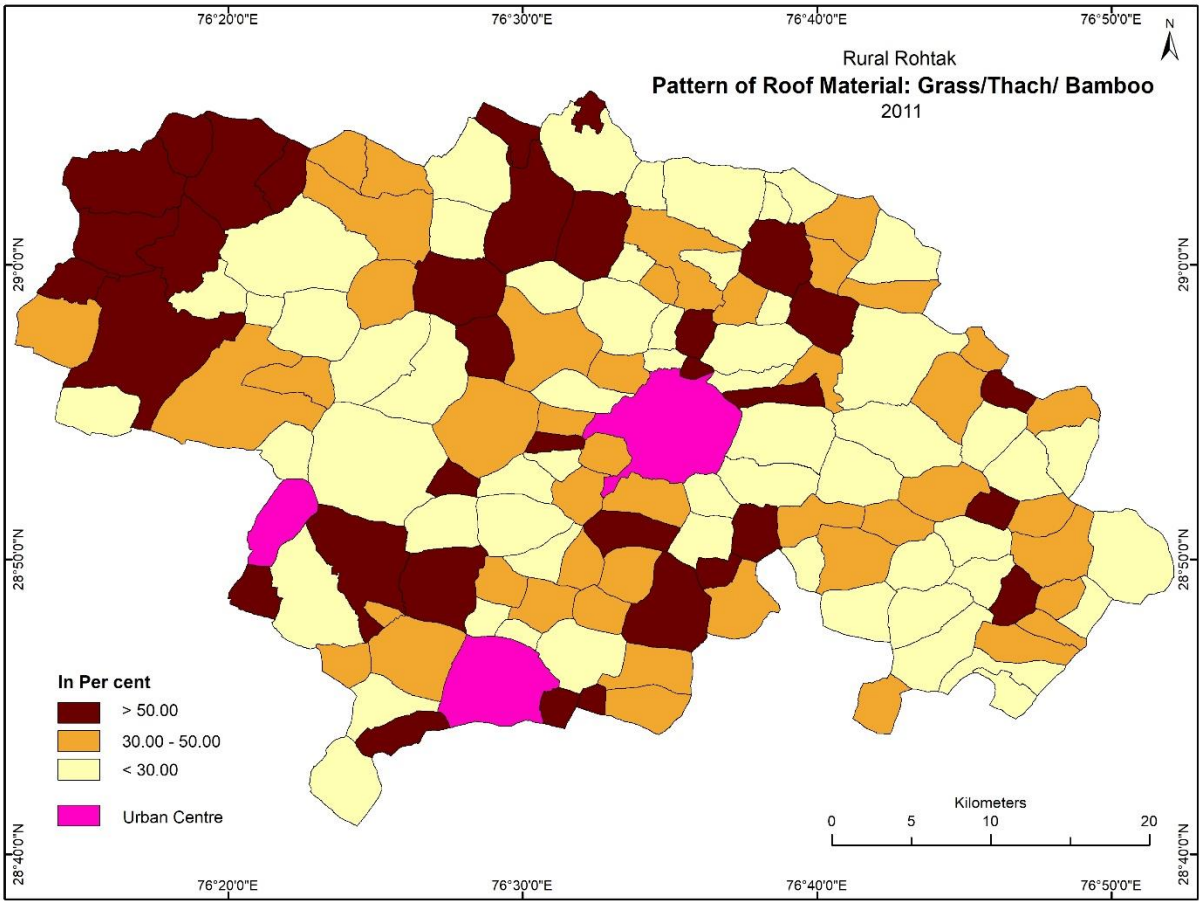
1. Material of roof; Grass/ Thatch/ Bamboo/ Wood/Mud etc. (X_1),
2. Material of roof; Plastic/ Polythene (X_2),
3. Material of roof; Tiles (X_3),
4. Material of roof; Burnt Brick (X_4),
5. Material of roof; Stone/ Slate (X_5),
6. Material of roof; G.I./Metal/ Asbestos sheets (X_6),
7. Material of roof; Concrete (X_7),

On the basis of natural break method, the thematic maps have been prepared by using ArcGIS software.

Result & Discussion

Spatial Pattern of Grass/Thatch/Bamboo

The map 1 shows the distribution of households utilizing traditional roof building materials, including grass, thatch, bamboo, wood, and mud, across numerous villages in Rohtak District, Haryana. Notably, Sarai Ahmed stands out as the village with the highest percentage of households (89.5%) using these traditional materials, indicating a prevalent reliance on age-old construction practices in this community. Following closely behind are Nandal and Pehrawar, with 85.2% each, showcasing a similar trend in neighboring villages. This concentration of traditional roof materials suggests a cultural attachment to customary building methods or may indicate limitations in accessing modern construction materials or technologies. Conversely, some villages exhibit significantly lower rates of traditional roof material usage. For instance, Garhi Bohar, located at the lower end of the spectrum with only 4.9% of households employing traditional materials, suggests a departure from customary building practices. Similarly, Bhalot and Pilana depict a similar trend, indicating a shift towards modern building materials or construction techniques. These villages might be experiencing urbanization or economic development, leading to the adoption of more contemporary housing construction practices, which typically offer better durability and structural integrity. The variations observed among different villages in Rohtak District highlight the diverse socio-economic and environmental factors influencing housing construction preferences and practices. Factors such as accessibility to modern building materials, income levels, cultural traditions, and local infrastructure development play crucial roles in determining the choice of roof building materials. Understanding these variations is essential for policymakers and urban planners to implement targeted interventions aimed at promoting sustainable and resilient housing development practices while respecting local traditions and preferences (Map 1).



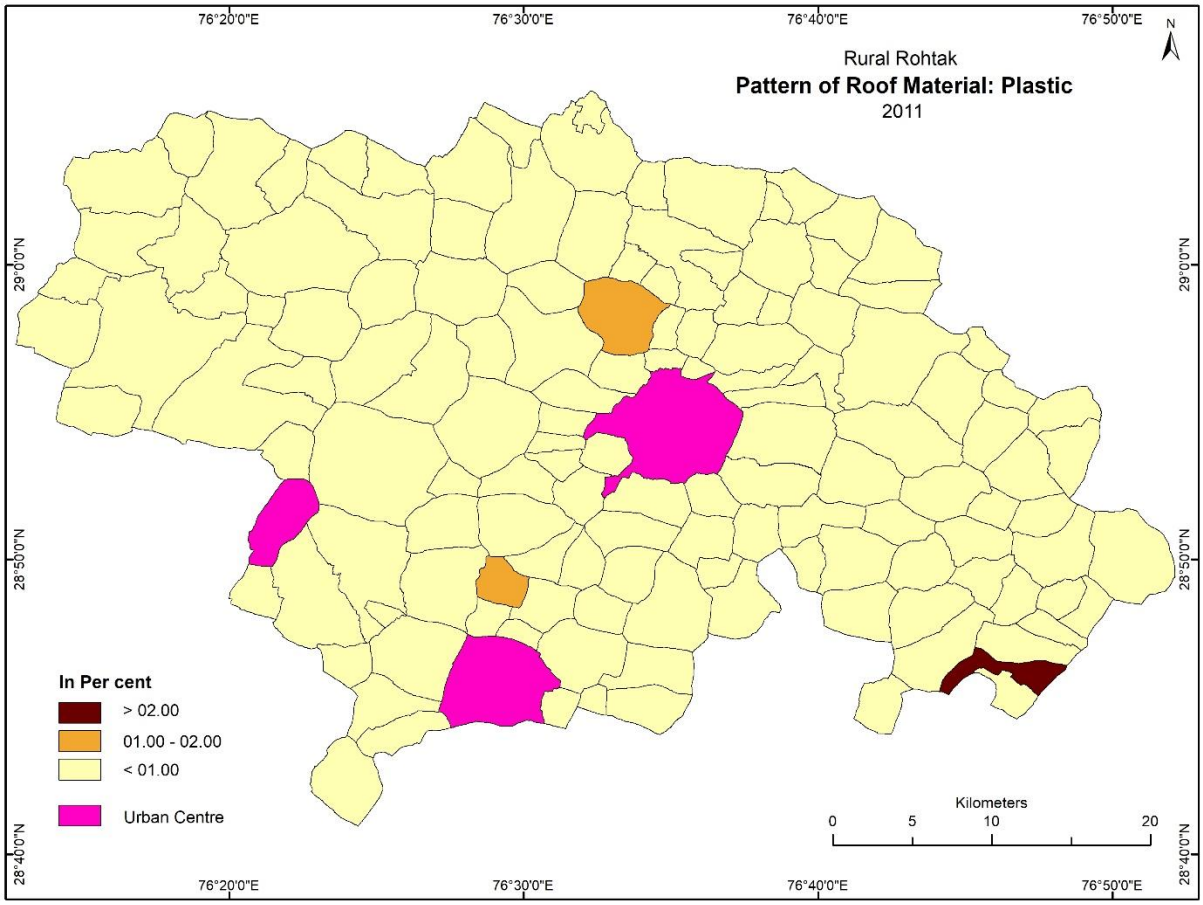
Source: Census of India, 2011.

Map 1

Spatial Pattern of Plastic Material

The map 2 presents data on the prevalence of households in various villages of Rohtak District, Haryana, using plastic or polythene as roof building materials. Notably, Sampal and Sampla emerge as the villages with the highest utilization rates, both at 2.4%. This indicates a significant but not dominant reliance on plastic or polythene in roofing construction in these areas. Titoli, with 1.1%, and Patwapur, with 1%, also demonstrate a notable presence of plastic or polythene in roofing materials. These figures suggest a growing trend in the adoption of modern roofing materials, albeit at varying degrees across different villages. Conversely, numerous villages exhibit minimal to zero usage of plastic or polythene in roof construction. Villages such as Sarai Ahmed, Nandal, Pehrawar, and Meham show a complete absence of households employing these modern materials. Factors influencing this preference could include cost, availability,

environmental concerns, or cultural considerations, highlighting the complex interplay of socio-economic and environmental factors shaping housing construction practices. The variations observed in the utilization of plastic or polythene as roof building materials among different villages underscore the diverse needs, preferences, and constraints faced by communities in Rohtak District (Map 2).



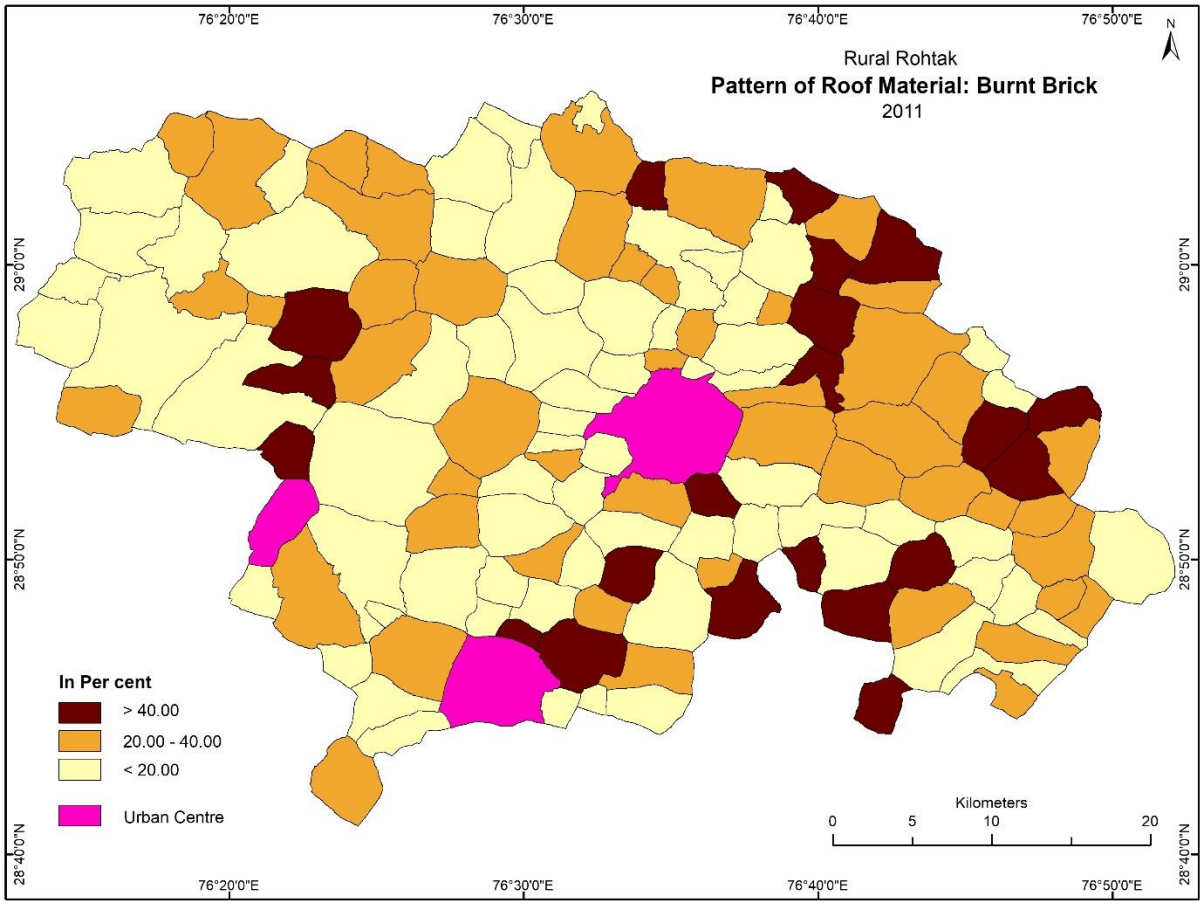
Source: Census of India, 2011.

Map 2

Spatial Pattern of Burnt Brick

The map 3 provided presents the distribution of households across various villages in Rohtak District, Haryana, based on the utilization of handmade tiles as roof building materials. Dobh emerges as the village with the highest percentage of households using handmade tiles, standing at 52.6%. This suggests a prevalent reliance on traditional roofing materials in Dobh. Following closely is Behlba, with 37.8%, indicating a substantial preference for handmade tiles in roofing

construction. Garhi Sampla and Balab also demonstrate considerable usage of handmade tiles, with 35.5% and 32.5%, respectively, underscoring the significance of traditional building practices in these communities. Conversely, numerous villages exhibit lower percentages or even zero utilization of handmade tiles in roof construction. Villages such as Sarai Ahmed, Nandal, Pehrawar, and Meham show no households employing handmade tiles, suggesting a deviation from traditional building practices in favor of alternative materials.



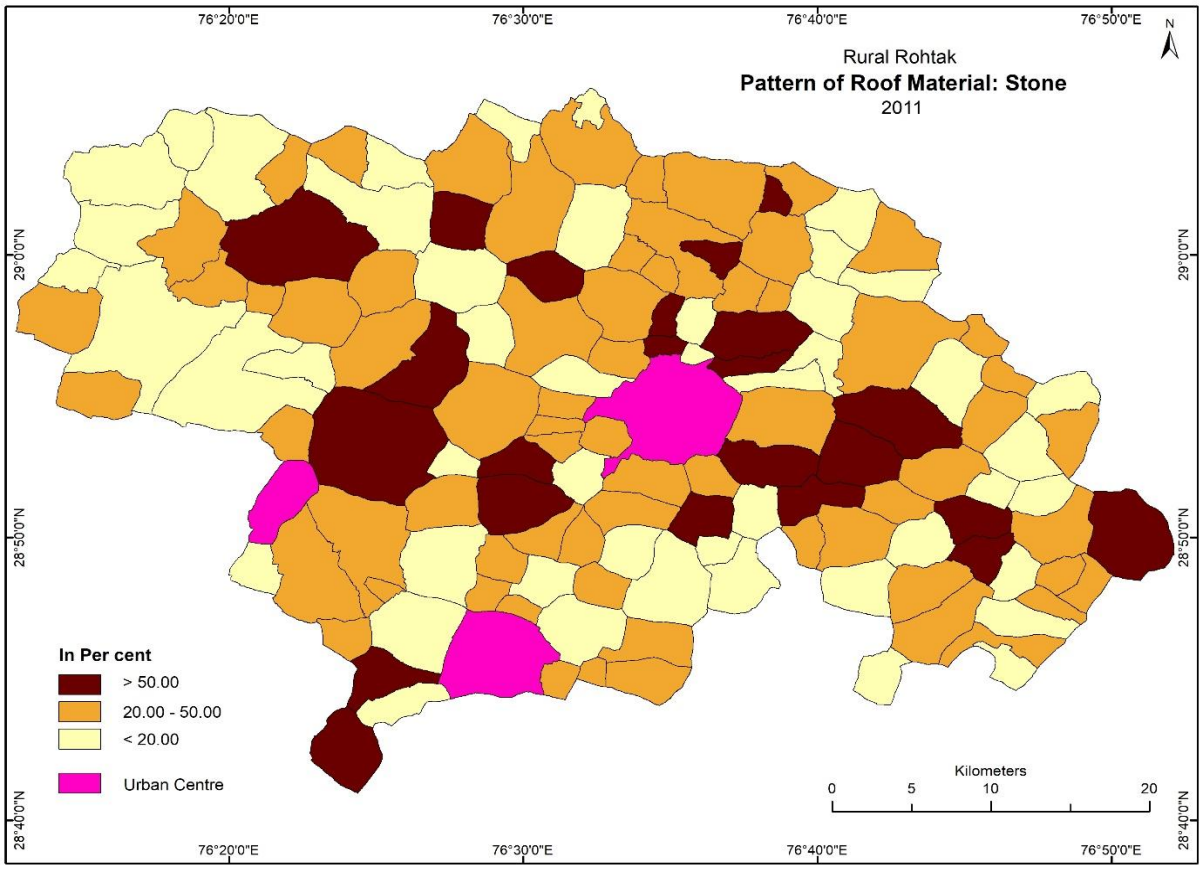
Source: Census of India, 2011.

Map 3

Spatial Pattern of Stone

The data provided reveals the distribution of households across various villages in Rohtak District, Haryana, based on the usage of machine-made tiles as roof building materials. Singhpura emerges as the village with the highest percentage of households using machine-made

tiles, with 13.8%, indicating a significant reliance on modern roofing materials in this community. Following closely are Sampal and Sampla, both at 9.9%, suggesting a similar trend in these areas. Additionally, Katwara, Farmana Badshapur, and Baland showcase considerable usage of machine-made tiles, with percentages ranging from 6.3% to 7.1%. This highlights a notable shift towards modern construction materials in these villages. Conversely, several villages exhibit lower percentages or even zero usage of machine-made tiles, indicating a preference for traditional roofing materials or limited access to modern alternatives. Understanding the distribution of roofing materials across different villages provides insights into the adoption of modern construction practices, socioeconomic factors, and infrastructure development in the region. Policymakers can utilize this information to formulate strategies for promoting sustainable housing solutions, improving access to modern construction materials, and addressing the diverse needs of communities across Rohtak District.

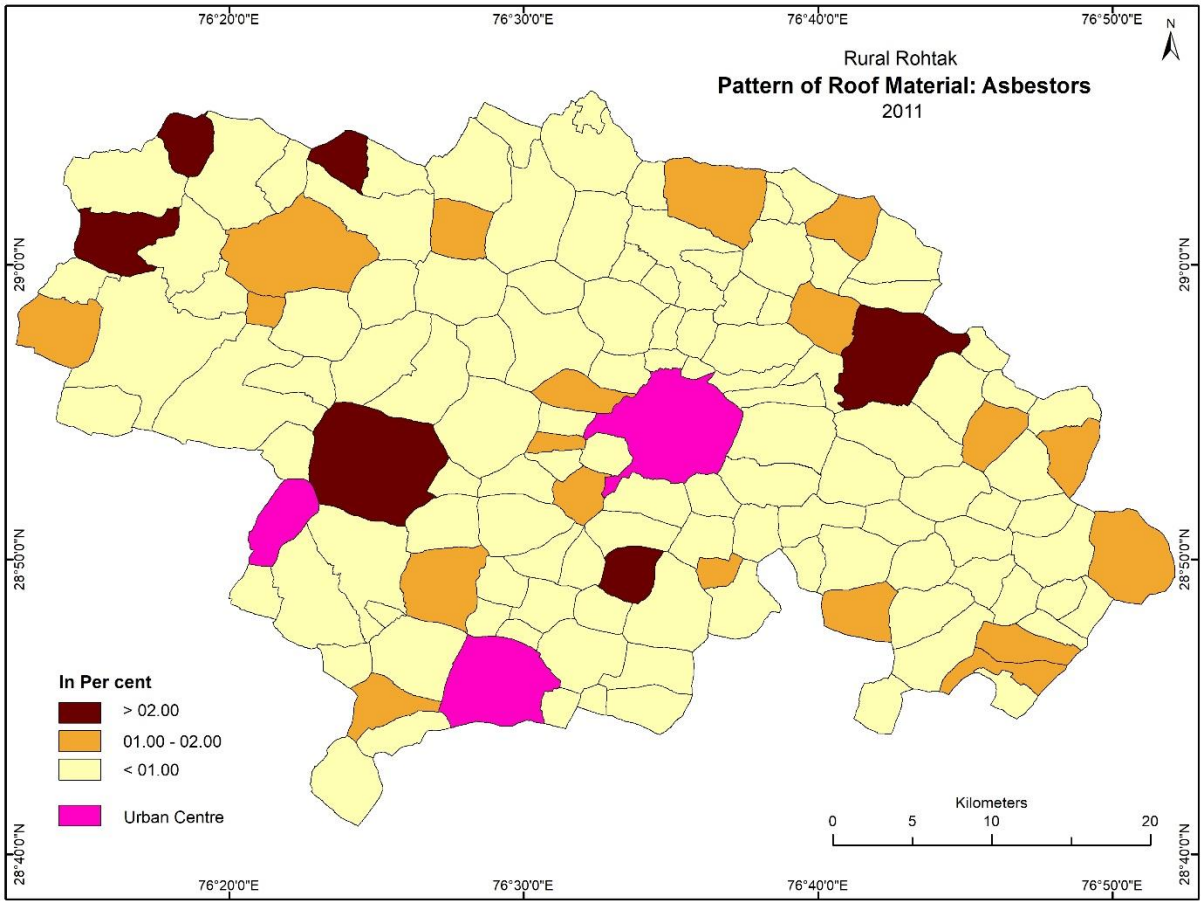


Source: Census of India, 2011.

Map 4

Spatial Pattern of Asbestors

The map 5 presents an extensive breakdown of the prevalence of G.I./Metal/Asbestos sheets across a wide array of villages, each denoted by its specific name and accompanied by a corresponding numerical value representing the prevalence of these materials within the village's construction landscape. Some villages, like Banyani, Bhaini Maharajpur, and Gurnauthi, boast relatively high prevalence scores, indicating a substantial integration of G.I./Metal/Asbestos sheets into their construction practices. With values of 3, 2.9, and 2.9, respectively, these villages likely exhibit a higher level of industrialization or access to modern construction materials, contributing to the widespread usage of these sheets in their building infrastructure. In contrast, several villages register lower prevalence scores, including Taja Majra, Sasrauli, and Sarai Ahmed, all marked with a prevalence value of 0. This suggests a minimal or nonexistent use of G.I./Metal/Asbestos sheets within the construction framework of these villages. Such findings may indicate reliance on alternative building materials, adherence to traditional construction techniques, or socio-economic factors influencing construction practices within these communities (Map 5).



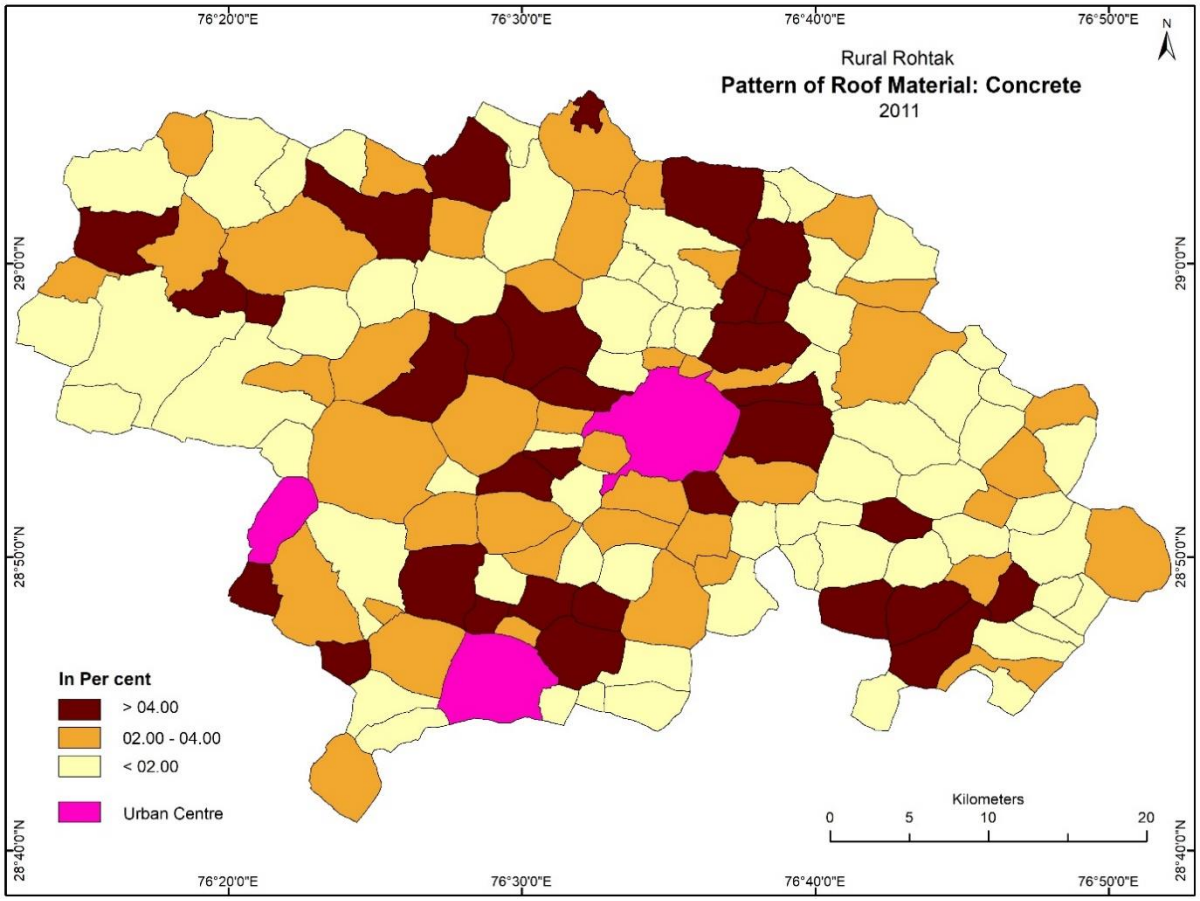
Source: Census of India, 2011.

Map 5

Spatial Pattern of Concrete

The map 6 offers a detailed insight into the prevalence of concrete structures across numerous villages, each identified by its specific name and accompanied by a numerical value representing the prevalence of concrete construction within the village. Several villages stand out with notably high prevalence scores, indicating a significant integration of concrete in their construction practices. For instance, Bhainsru Kalan leads the pack with an impressive prevalence score of 20.9, suggesting that a substantial majority of structures within this village are built using concrete. This could signify a high level of modernization, infrastructure development, or access to construction materials in Bhainsru Kalan. Following closely behind are villages like Bhaini Maharajpur and Garhi Bohar, both with prevalence scores of 15.2, indicating a considerable reliance on concrete in their construction activities. These villages likely exhibit similar levels of

industrialization and infrastructure development, reflecting a trend towards the use of modern building materials and techniques. Conversely, at the lower end of the prevalence spectrum, villages like Nasirpur and Patwapur register a prevalence score of 0, indicating minimal or no usage of concrete in their construction practices. This could be attributed to factors such as limited access to modern construction materials.

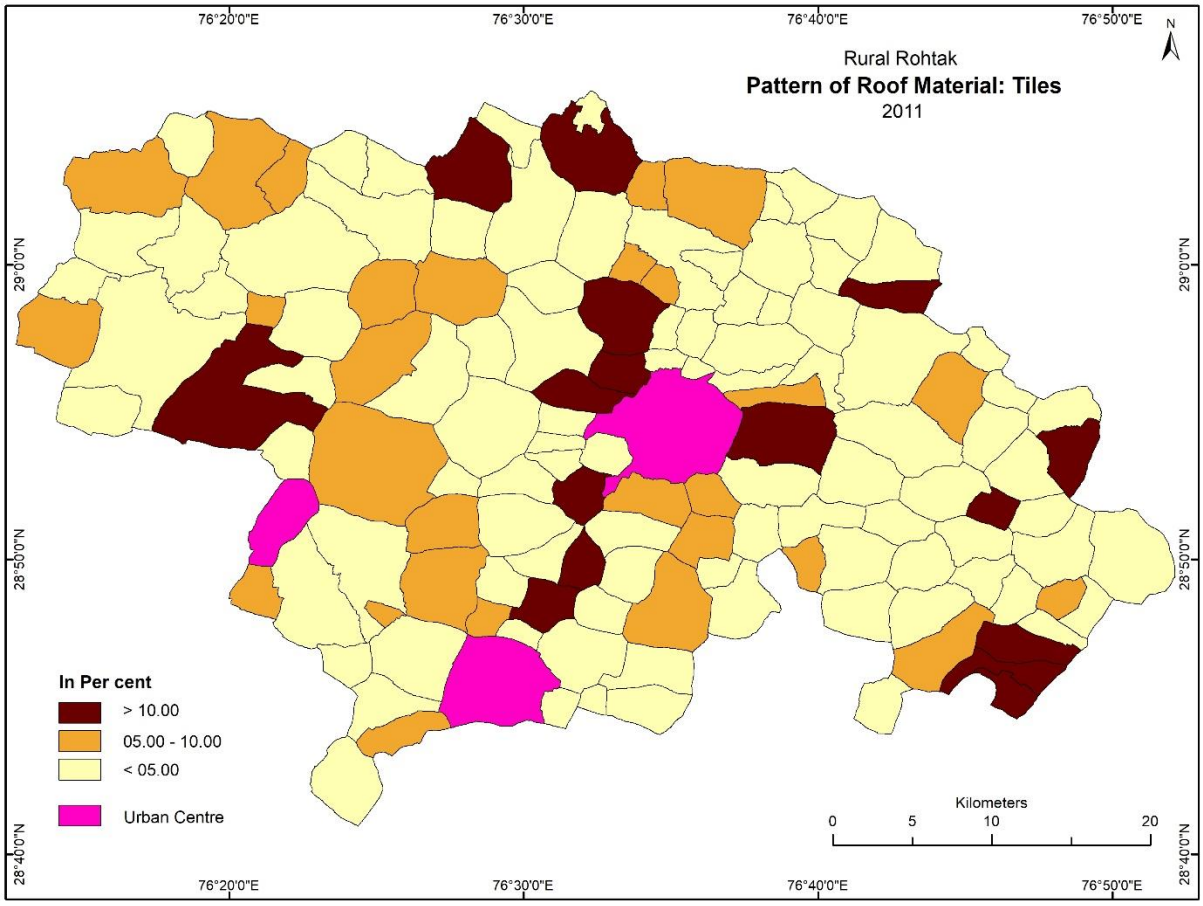


Source: Census of India, 2011.

Map 6

Spatial Pattern of Tiles

Map 7 shows tile prevalence in villages, with high scores indicating substantial tile usage in construction practices. Dobh and Shekhupur Titri have high prevalence scores of 52.7 and 40, respectively, indicating extensive tile use in construction. Conversely, Ghilor Khurd and Nasirpur have low prevalence scores, possibly due to limited access to modern materials or preference for alternative materials (Map 7).



Source: Census of India, 2011.

Map 7

Conclusion

The provided tables offer insights into the construction practices within various villages, focusing on the utilization of concrete and tiles in building structures. In the first table, the data presents the prevalence of concrete usage across different villages, with numerical values indicating the percentage of concrete in construction within each village. Villages like Bhainsru Kalan, Bhaini Maharajpur, and Garhi Bohar exhibit relatively high percentages of concrete usage, suggesting a strong reliance on concrete in their construction activities. On the other hand, villages such as Nasirpur and Patwapur register a concrete prevalence score of 0, indicating minimal or no usage of concrete in their construction practices. In the second table, the focus shifts to the prevalence of tiles in construction activities within various villages. Villages like Dobh, Shekhupur Titri, and Basantpur demonstrate high percentages of tile usage, suggesting a

significant integration of tiles in their construction practices. Conversely, villages like Ghilor Khurd and Nasirpur show no usage of tiles, indicating alternative construction practices or limited access to modern construction materials in these areas. Overall, the tables provide valuable insights into the construction preferences and practices across different villages, highlighting the diverse approaches to building structures within the region.

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