International Journal in Management and Social Science
Volume 6 Issue 12, December 2018 ISSN: 2321-1784 Impact Factor: 6.178
Journal Homepage: http://ijmr.net.in, Email: irjmss@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal

FLOOR BUILDING MATERIAL IN ROHTAK DISTRICT: AN INTER-VILLAGES ANALYSIS

Author: **Archana**
Open Scholar (Geography)
Email ID: archi.rohilla@gmail.com

Abstract

The choice of building materials significantly influences the structural integrity, durability, and overall quality of construction. In the context of Rohtak District, Haryana, understanding the prevalent levels of floor building materials is crucial for ensuring the sustainability and safety of constructed structures. This study aims to assess the current scenario of floor building materials used in residential and commercial constructions across Rohtak District. Through a combination of field surveys, material sampling, and laboratory analysis, data regarding the types, quality, and distribution of floor building materials will be collected and analyzed. Factors such as availability, affordability, and cultural preferences will also be considered to provide a comprehensive understanding of material usage patterns. The findings of this study will not only contribute to the existing knowledge base but also serve as a valuable resource for architects, engineers, policymakers, and stakeholders involved in construction practices in Rohtak District. Ultimately, the insights gained from this research endeavor will facilitate informed decision-making processes aimed at enhancing the structural resilience and sustainability of buildings within the region. The main objectives of the present study are to identify the prevalent types of floor building materials used in residential constructions within Rohtak district, Haryana and to assess the quality standards of the floor building materials commonly employed in construction practices. The data related to the study have been collected from census of India, 2011 and processed in the M S excel soft.

Keywords: Mud, Wood/Bamboo, Burnt Brick, floor material, Rohtak district

Introduction

Cement concrete flooring is widely used in both residential and commercial buildings in Rohtak District. It offers durability, ease of maintenance, and suitability for heavy foot traffic areas. Vitrified tiles are popular choices for flooring in modern buildings. They come in various designs,

sizes, and colors, offering a wide range of aesthetic options. Vitrified tiles are known for their durability, stain resistance, and low maintenance requirements (Madhumathi et al., 2014).

Ceramic tiles are commonly used for flooring in kitchens, bathrooms, and other utility areas in Rohtak District. They are available in a variety of patterns and textures, providing options for customization. Marble flooring is preferred in upscale residential and commercial properties in Rohtak District. It offers a luxurious look, durability, and natural cooling properties, making it suitable for the region's hot climate (Dana & Das, 2002). Granite flooring is another popular choice for high-end buildings in Rohtak District. It is known for its durability, scratch resistance, and elegant appearance. Terrazzo flooring, made by embedding marble, granite, or other decorative aggregates into a cementitious binder, is used in some buildings for its aesthetic appeal and durability (Das et al., 2012).

Floor building material selection in Rohtak District, Haryana, is influenced by budget, design preferences, space use, climate, and local availability. Consultation with local builders or architects is recommended for accurate information (Namkane et al., 2016).

Objectives

The main objectives of the present study are to identify the prevalent types of floor building materials used in residential constructions within Rohtak district, Haryana and to assess the quality standards of the floor building materials commonly employed in construction practices.

Database & Methodology

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

1. Material of floor; Mud/Unburnt Brick (X_1),
2. Material of floor; Wood/Bamboo (X_2),
3. Material of floor; Burnt Brick (X_3),
4. Material of floor; Stone (X_4),
5. Material of floor; Cement (X_5),
6. Material of floor; Mosaic Tiles (X_6),

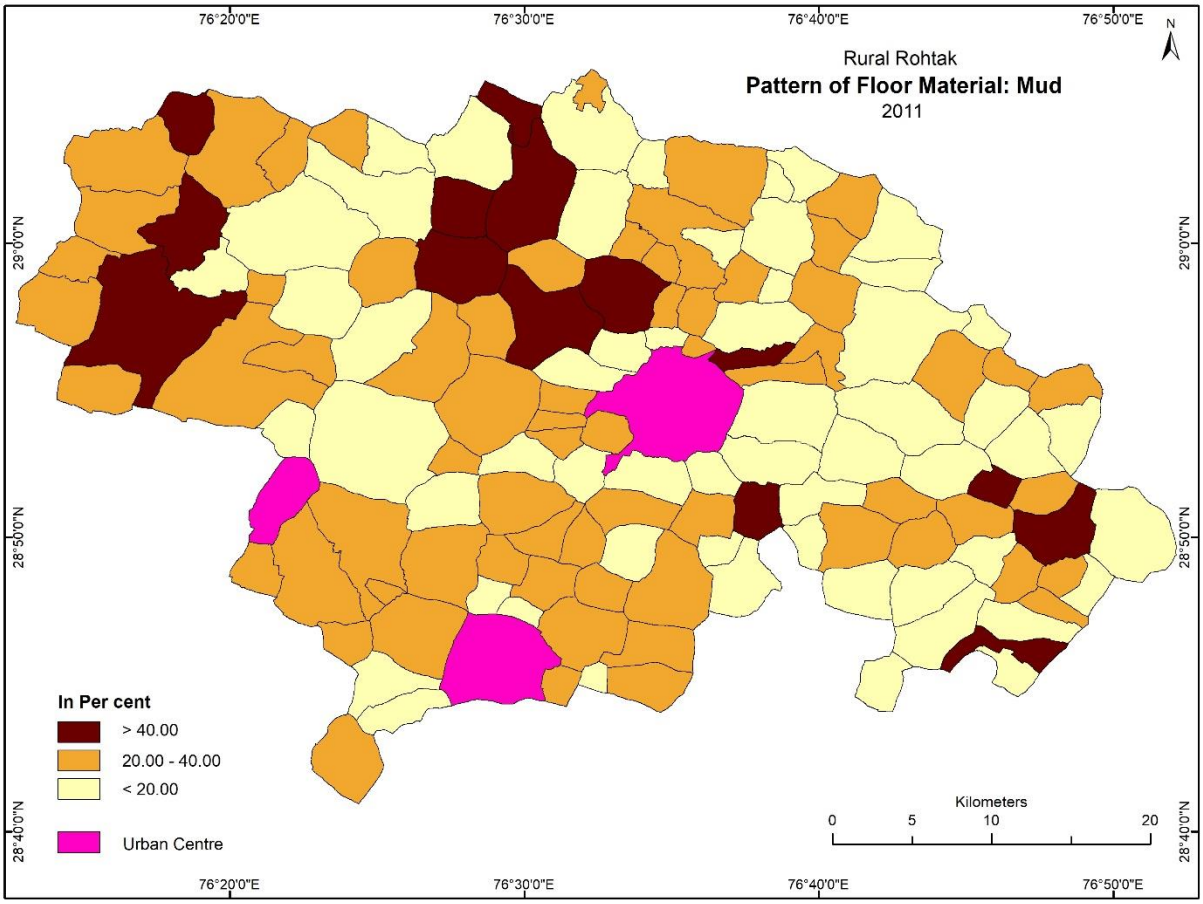
On the basis of natural break method, the thematic maps have been prepared by using ArcGIS software.

International Journal in Management and Social Science
Volume 6 Issue 12, December 2018 ISSN: 2321-1784 Impact Factor: 6.178
Journal Homepage: http://ijmr.net.in, Email: irjmss@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal

Result & Discussion

Spatial Pattern of Mud/Unburnt Brick

The map 1 presents the utilization of mud or unburnt brick as floor building material across various villages, with each village identified alongside the corresponding percentage of households employing this traditional construction material. Notably, the villages of Katesra, Manjha, Sanga Hera, and Nasirpur show notably high percentages, ranging from 56.8% to 63.2%, indicating a prevalent reliance on mud or unburnt brick for flooring purposes within these communities. Conversely, villages like Mokhra Kheri, Kherari, and Pilana demonstrate relatively higher percentages, around 40% to 42.2%, suggesting a lesser prevalence of this traditional building material (Map 1).



Source: Census of India, 2011.

Map 1

The map 1 provides insights into the prevalence of mud or unburnt brick as a floor building material across various villages. Each village is accompanied by the respective percentage of households utilizing this traditional construction material. Villages such as Farmana Khas,

Taimurpur, and Sisar Khas exhibit relatively moderate percentages, ranging from 38.5% to 39.6%, indicating a significant reliance on mud or unburnt brick for flooring purposes within these communities. Conversely, villages like Makrouli Kalan, Farmana Badshahpur, and Gaddi Kheri demonstrate moderate percentages, around 20% to 20.8% prevalence of this traditional building material.

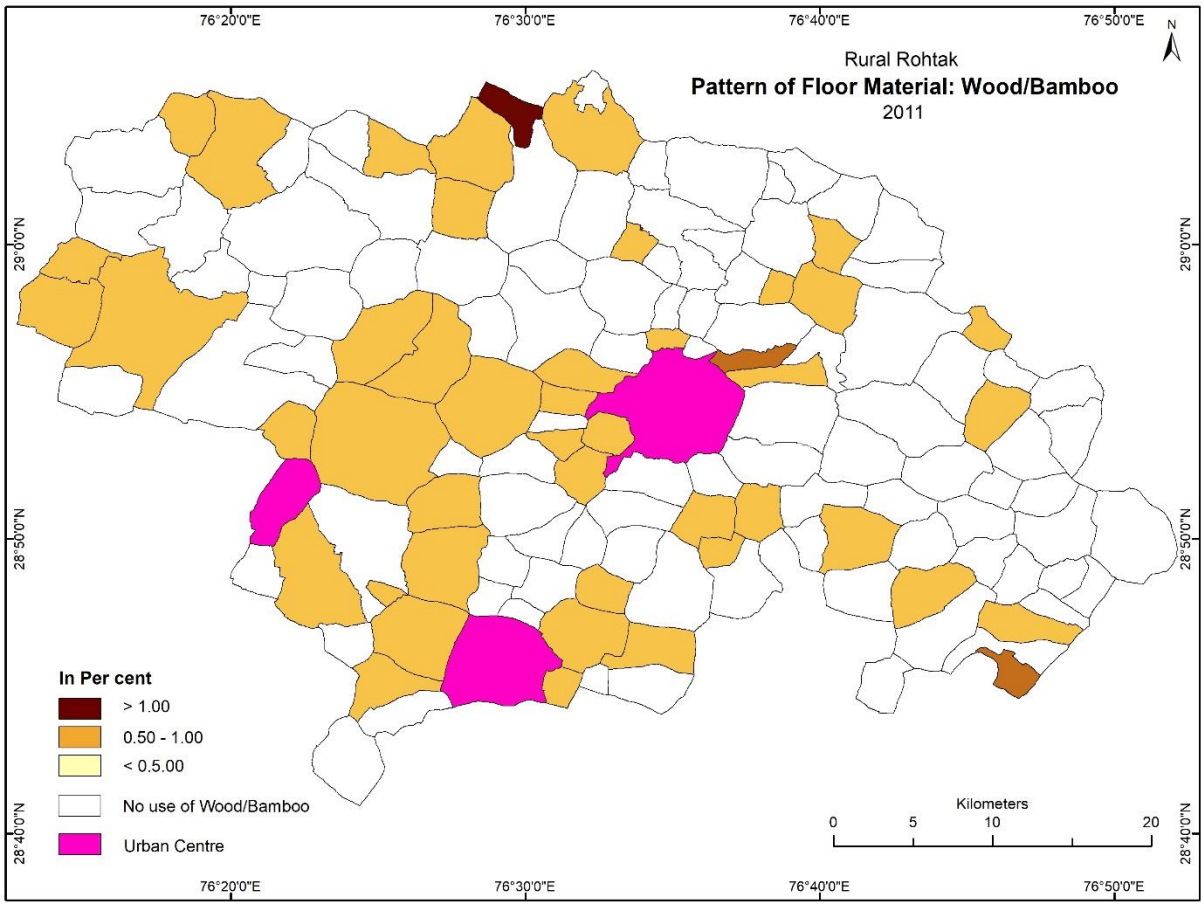
The map 1 presents various villages, highlighting the percentage of households employing mud or unburnt brick as floor building material, with a particular focus on villages where this traditional practice is less common. Among these villages, Ladhot, Bahmanwas, and Rithal Nirwal demonstrate a prevalence ranging from 19.5% to 19.6%, indicating a relatively lower reliance on mud or unburnt brick for flooring purposes. Similarly, Kahni 121/2Biswa, Ritauli, and Garhi Bohar exhibit percentages around 18.5% to 19%, reflecting a similar trend of decreased usage of traditional construction materials. Additionally, villages like Maina, Kheri Sadh, and Mokhra Kheri Rojh showcase percentages of around 18% to 18.5%, suggesting a modest presence of mud or unburnt brick as floor building material within these communities. The data underscores a shift away from traditional construction practices in these areas, potentially influenced by factors such as economic development, access to modern building materials, and evolving cultural preferences. Further investigation into the underlying socio-economic dynamics driving these trends could provide valuable insights for housing infrastructure development and sustainable construction initiatives in rural regions (Map 1).

Spatial Pattern of Wood/Bamboo

The villages with a high percentage of households building their flooring out of bamboo or wood are shown in the second map. In Nasirpur village, the proportion of homes having wood or bamboo flooring is roughly 1.1% in Manjha village. The map 2 provides data on villages where there is a moderate percentage of households utilizing wood or bamboo as floor building material. In Ghari Balab (120), approximately 0.9% of households use wood or bamboo for flooring, while in Pilana (116), Kherari (133), Gurawar (97), and Maroudi Jatan (103), this percentage is 0.5%. These figures indicate a notable but relatively modest presence of wood or bamboo as alternative construction materials in these villages.

Further exploration could investigate the factors driving the choice of wood or bamboo, such as local availability, cultural traditions, or specific structural requirements, to gain insights into the diversity of construction practices within these communities. Among these villages, Mokhra Khas,

Kakrana, and Gaddi Kheri exhibit a prevalence of 0.4%, followed by Sunderpur and Baliana with 0.3%. Other villages like Anwal, Bhaini Surjan, Gudhan, and Rurki show a slightly lower prevalence of 0.2%. The data underscores a minimal presence of wood or bamboo as floor building material in these areas compared to other construction materials (Map 2).



Source: Census of India, 2011.

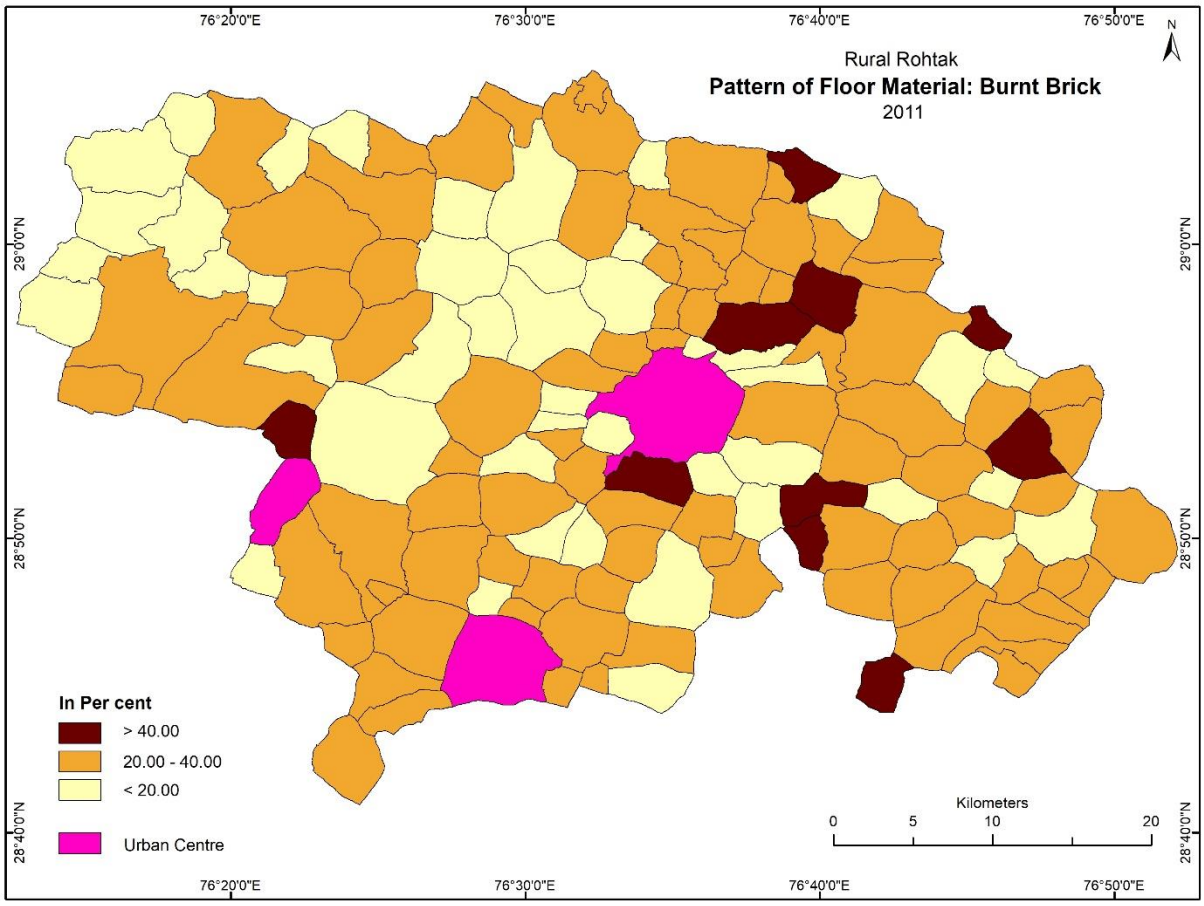
Map 2

Spatial Pattern of Burnt Brick

The villages shown on map 3 are those where a sizable portion of households create their floors out of burned brick. Ghuskani is the most advanced of these villages, with 63.9% of houses using burnt brick; Taja Majra comes in second with 51.6% and Kansala with 46.5%. Additionally, Karountha, Ritauli, and Baland show percentages ranging from 43.8% to 44.3%, indicating a considerable reliance on burnt brick within these communities. Furthermore, villages like Dhamar, Makrouli Khurd, Ladhot, and Kiloi Dopana demonstrate percentages around 41.8% to 42.3%, highlighting a substantial presence of burnt brick as floor building material. The data underscores the widespread adoption of burnt brick for flooring purposes in these areas, possibly influenced by factors such as

availability, durability, and cost-effectiveness. The table presents data on villages where there is a moderate percentage of households utilizing burnt brick as floor building material. Among these villages, Rurki leads with 39.9% of households using burnt brick, followed closely by Sanghi and Rithal Phogat with 39.7%. Additionally, Kiloi Khas, Pakasma, and Gurawar demonstrate percentages ranging from 39.1% to 37.9%, indicating a substantial reliance on burnt brick within these communities.

Furthermore, other villages like Busana, Asan, Gaddi Kheri, and Rithal Nirwal show percentages ranging from 36.8% to 36.6%. The map 3 displays villages with a low percentage of households using burnt brick as floor building material. Bhaini Chanderpal and Lahli lead with 19.9%, followed by Farmana Badshahpur at 19.8%. Villages like Bahelba, Gudhan, and Bhainsru Kalan exhibit percentages ranging from 19.3% to 19.2%. Furthermore, Bhagotipur, Nigana, Garhi Bohar, and Dataur demonstrate percentages around 19.1% to 19%. Others, such as Pahrawar, Bhaini Surjan, and Gurnauthi, have percentages ranging from 18.1% to 17.6% (Map 3).



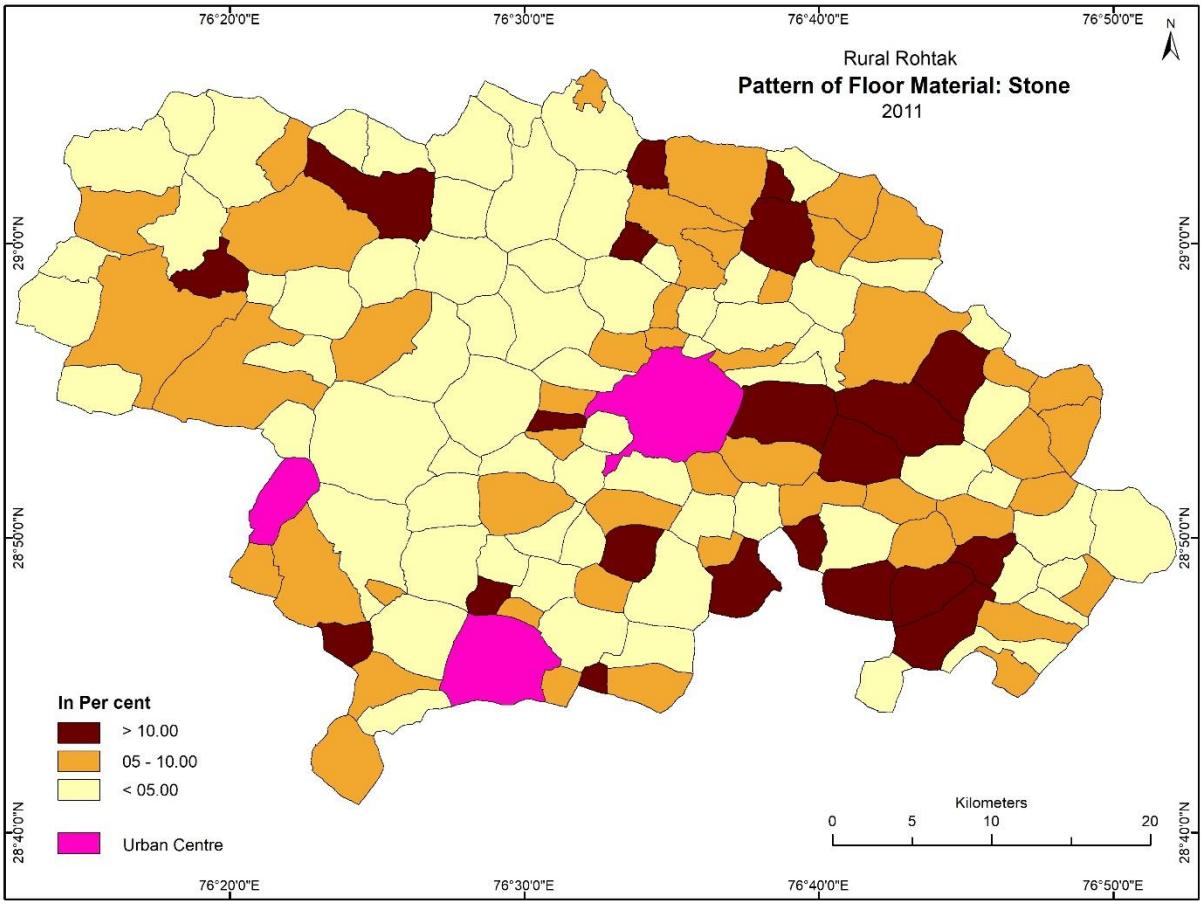
Source: Census of India, 2011.

Map 3

Spatial Pattern of Stone

The map 4 illustrates villages with a high proportion of households using stone as floor building material. Kehrawar leads with 20.3%, followed by Dataur at 19.5%. Other villages like Chulliana, Karaur, and Bhainsru Khurd exhibit percentages ranging from 19.2% to 14.8%. Additionally, Mokhra Kheri Rojh, Karountha, and Kheri Sadh demonstrate percentages between 13.4% and 12.4%. Similarly, Bakheta, Gudhan, and Garhi Bohar present percentages around 11.9% to 11.6%. Villages like Ismaila-11B, Katwara, and Gijji have percentages ranging from 11.2% to 10.8%, while others such as Jalalpur, Samar Gopalpur, and Ismaila 9-B exhibit percentages of around 10.8% to 10.7%. Finally, Bohar (Part), Ghilor Kalan, Bahmanwas, and Gandhra have percentages around 10.7% to 10.0%. The map 4 depicts villages with a moderate proportion of households using stone as floor building material. Baliana leads with 9.9%, followed closely by Polangi at 9.8%. Mokhra Khas and Ghari Balab exhibit percentages of 9.5% and 9.2%, respectively, while Kiloi Khas and Balab have percentages of 9.1%. Similarly, Naya Bans and Muradpur Tekna show percentages of 9% each. Villages like Kisranti and Kharak Jatan present percentages of 8.8%, whereas Maina and Kiloi Dopana have percentages of 8% and 7.9%, respectively. Other villages like Sanghi, Jindran Kalan, and Titoli exhibit percentages around 7.9% to 7.8%. Additionally, Humayunpur and Simli have percentages of 7.3% and 7.2%, respectively, while Nunond and Sahan Majra show percentages of 7.2% and 6.9%, respectively. Mokhra Kheri, Mungan, and Pahrawar present percentages of 6.8%, 6.8%, and 6.7%, respectively, while Kahnaur and Bahelba exhibit percentages of 6.5%. Other villages like Kabulpur, Samchana, and Kanheli (Part) show percentages ranging from 6.1% to 6%. Sundana, Gaddi Kheri, and Rithal Phogat exhibit percentages of 5.6%, 5.5%, and 5.4%, respectively, while Gurawar, Garhi Sampla, and Maroudi Jatan have percentages of 5.4%, 5.4%, and 5.3%, respectively.

International Journal in Management and Social Science
Volume 6 Issue 12, December 2018 ISSN: 2321-1784 Impact Factor: 6.178
Journal Homepage: http://ijmr.net.in, Email: irjmss@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal



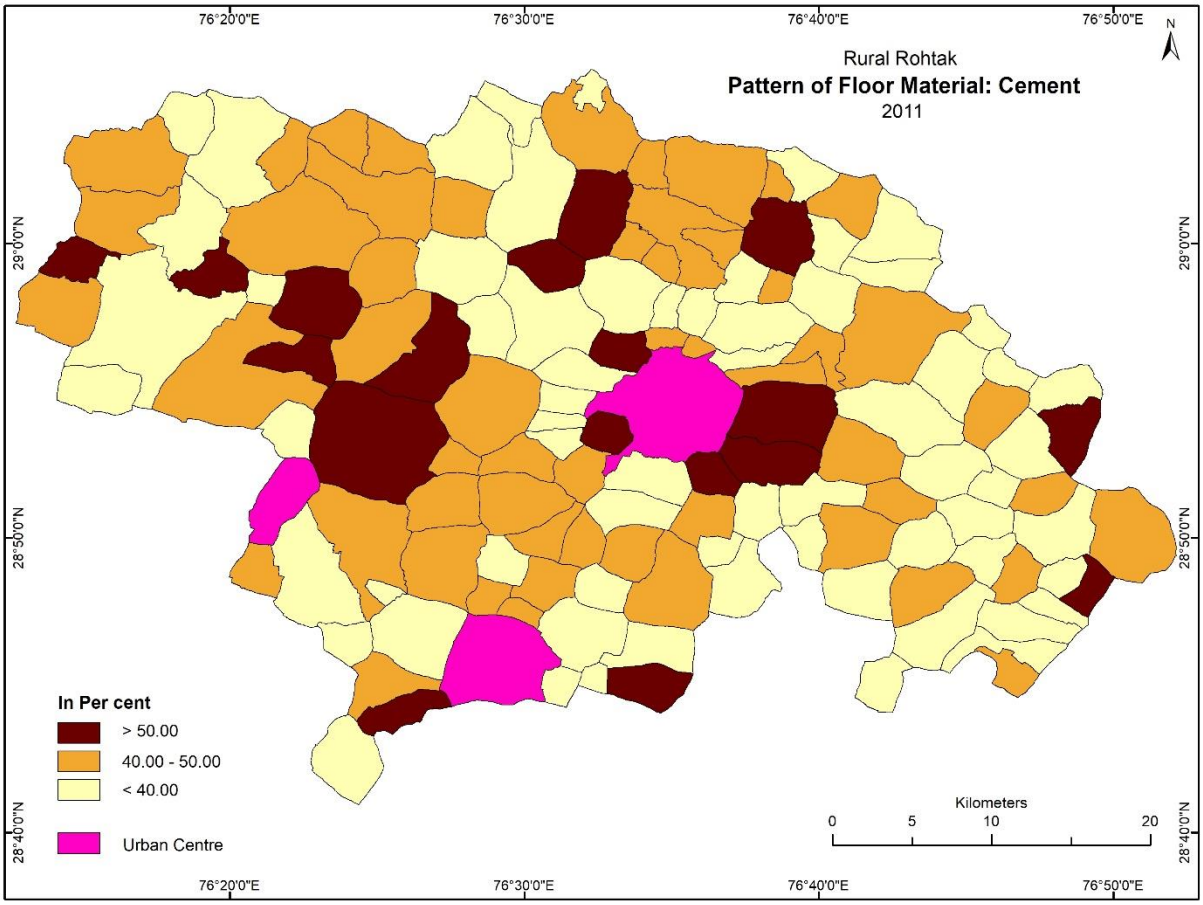
Source: Census of India, 2011.

Map 4

Finally, villages like Bhalot, Kansala, Atail, and Kakrana have percentages ranging from 5.2% to 5%. Moreover, Kultana and Manjha also have a percentage of 5% (Map 4). The 4 map presents villages with a low proportion of households using stone as floor building material. Makrouli Khurd, Sunderpur, and Gurauthi show the low percentages, each at 4.9%. Following closely is Ajaib at 4.7%. Maroudi Rangran and Dobh exhibit percentages of 4.4% and 4.3%, respectively. The villages of Bharan, Jasia, Gurnauthi, Nigana, Rurki, Pakasma, Makrouli Kalan, Lahli, Bainsi, Dhamar, Bahali Anandpur, Hassangarh, Bhainsru Kalan, Singhpura, Kherari, Madina Kaursan, Ritauli, Gugaheri, Bhagotipur, Kherainti, Baland, Madina Gindhran, Sanga Hera, Kahni 121/2Biswa, Kahni 7 1/2 Biswa, Sisar Khas, Nandal, Lakhan Majra, Bedwa, Asan, and Ladhot have varying percentages. The percentages of various villages in the region are as follows: Nidana and Bhaini Chanderpal have 2.7% and 2.6%, Khadwali and Bhaini Surjan have 2.5% and 2.5%, Bhaiyan Pur and Chamaria have 2.3% and 2.2%, Nindana and Maham (Rural)(Part) have 2.2% each, Chiri and Kharkhra have 1.9% each, Morkheri and Patwapur have 1.8% and 1.6%, Ghilor Khurd and Ghuskani have 1.3% and 1.1%, and Anwal and Bahu Jamalpur have 0.7% and 0.4%.

Spatial Pattern of Cement

The map 5 shows villages with a high proportion of households using cement as floor building material. Bedwa leads with 66% of households using cement, followed closely by Bhaiyan Pur with 64.6%. Morkheri stands at 59.9%, while Sahan Majra and Ghilor Khurd exhibit percentages of 58.6% and 57.3%, respectively. Bhalot and Kheri Sadh show percentages of 55.7% and 54.4%, respectively, while Humayunpur and Sasrauli present percentages of 54.3% and 53.7%, respectively. Maham (Rural)(Part) exhibits a percentage of 53.5%, while Kanheli (Part) and Bhaini Chanderpal show percentages of 53.1% and 52.7%, respectively. Similarly, Kherainti and Jalalpur present percentages of 52.4% and 51.4%, respectively. Other villages like Bohar (Part), Lahli, Jindran Kalan, and Garhi Sampla exhibit percentages of 50.9%, 50.9%, 50.5%, and 50.4%, respectively (Map 5). The map presents information on the percentage of households within various villages that employ cement as the primary material for constructing their floors. Each row corresponds to a different village, while the corresponding column displays the proportion of households within that village utilizing cement for their floor construction. For instance, in Kehrawar(40), nearly half of the households (49.8%) utilize cement for their flooring. Similarly, in Masudpur(110), the proportion stands at 49.2%. This data offers valuable insights into the prevalence of cement usage in floor construction across different villages, shedding light on regional construction practices and material preferences.



Source: Census of India, 2011.

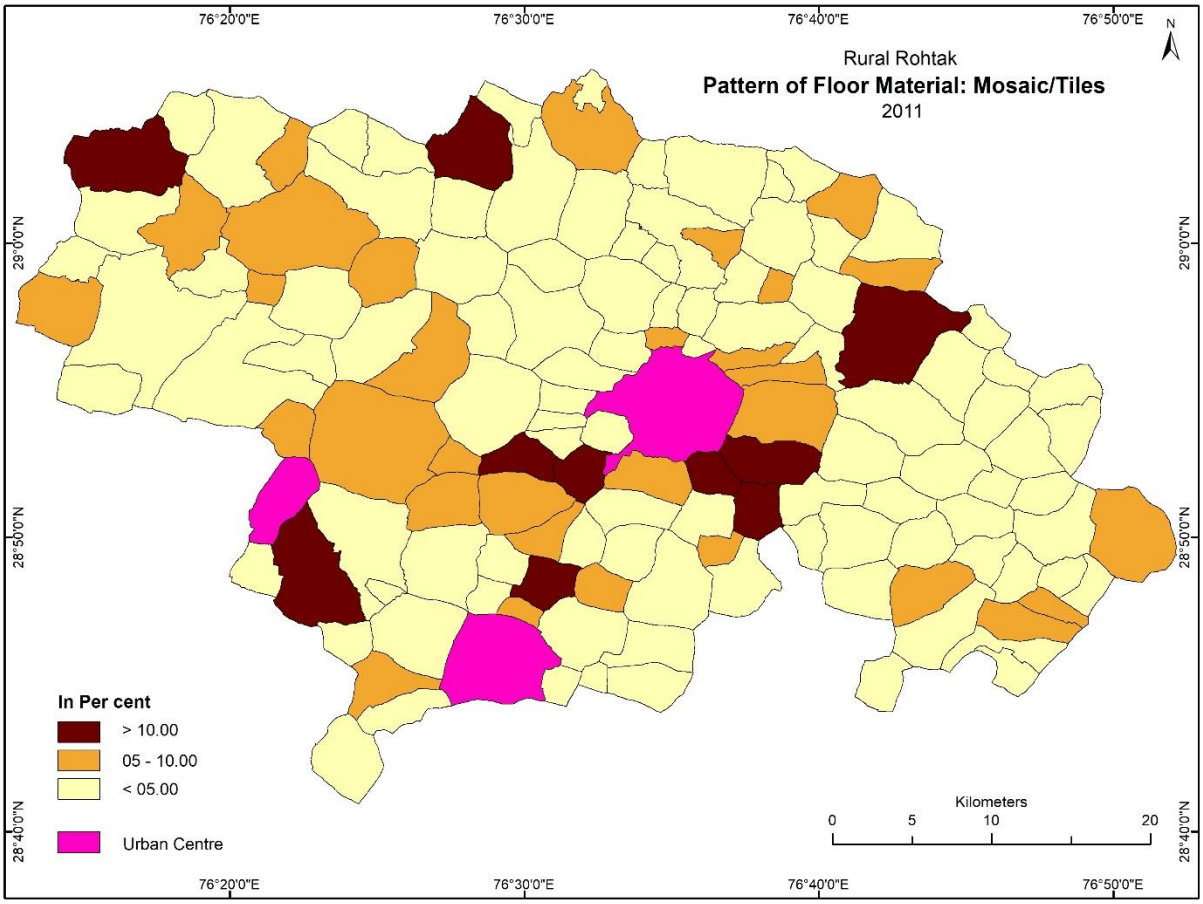
Map 5

This provides data on the percentage of households within various villages that utilize cement as the primary material for their flooring. Each row represents a different village, while the corresponding column indicates the proportion of households in that village using cement for floor construction. For example, in Pakasma(57), 39.8% of households employ cement for their flooring, while in Gandhra(44), the percentage is slightly lower at 39.7%. The data offers insights into the prevalence of cement usage in floor construction across different villages, reflecting regional preferences and construction practices (Map 5).

Spatial Pattern of Mosaic/Tiles

The map 6 illustrates the distribution of households using mosaic or floor tiles as their primary floor building material across various villages. Among these, Kanheli (Part)(73) stands out with 24.5% of households employing mosaic or floor tiles, followed by Bhainsru Kalan(30) with 18% and Garhi Sampla(35) with 17.4%. Additionally, Madina Kaursan(105) and Kakrana(104) have 15.3% and 15.2% of households, respectively, using mosaic or floor tiles. Further down the list, Kultana(16)

and Dobh(99) exhibit 13.2% and 12.4%, respectively. Meanwhile, Bahu Jamalpur (93) shows 10.8% of households utilizing mosaic or floor tiles, and both Pilana(116) and Singhpura(92) demonstrate 10.5% each. Overall, the data sheds light on the prevalence of mosaic or floor tiles as a flooring material across different villages.



Source: Census of India, 2011.

Map 6

The table provides data on the proportion of households in various villages utilizing mosaic or floor tiles as their primary floor building material. Notably, Hassangarh(29) records the highest percentage at 9.8%, followed by Masudpur(110) with 9.5%, and Nidana(98) with 9.2%. Conversely, Baland (106) and Bhaini Surjan (116) exhibit the lowest percentages at 5.1% each. Other villages such as Jindran(87) at 8.5%, Ismaila-11B(37) at 8%, and Morkheri(48) at 7.8% also feature prominently in the distribution of mosaic or floor tiles as a building material for households. This data offers insight into the prevalence of mosaic or floor tiles across different village communities (Map 6). The map 6 presents data on the percentage of households in various villages utilizing mosaic or floor tiles as their primary floor building material. For instance, Sasrauli(78), Garhi Bohar(135), Gandhra (44), and Atail (46) each record a rate of 4.9%, ranking among the

highest proportions. Conversely, Nasirpur (77), Sarai Ahmed (76), Taimurpur(113), Shekhupur Titri (119), Jalalpur(100), and Sahan Majra (81) register a rate of 0%, suggesting no usage of mosaic or floor tiles in these villages. This data offers insights into the distribution of different floor building materials across various rural communities.

Conclusion

This table outlines the percentage of households in each village that use cement as their primary floor building material. Villages like Bedwa, Bhaiyan Pur, and Morkheri exhibit relatively high percentages, indicating a prevalent use of cement for flooring, ranging from 59.9% to 66%. Conversely, villages like Garhi Sampla, Jindran Kalan, and Garhi Bohar show lower percentages, ranging from 50.4% to 50.5%. This suggests variations in construction preferences or perhaps differences in economic factors influencing construction choices among these communities. In this table, the focus shifts to villages where households utilize mosaic or floor tiles for their flooring needs. Villages like Kanheli (Part) and Bhainsru Kalan stand out with the highest percentages at 24.5% and 18%, respectively. This indicates a significant preference for mosaic or floor tiles in these areas. On the other hand, villages like Singhpura, Pilana, and Bahu Jamalpur exhibit lower percentages, ranging from 10.3% to 10.8%, suggesting a lesser prevalence of mosaic or floor tiles in these communities compared to other flooring materials. This table provides further insights into villages using mosaic or floor tiles, offering additional data points. Villages such as Sasrauli, Garhi Bohar, and Gandhra demonstrate the highest percentages of households using these materials, each at 4.9%. Conversely, villages like Nasirpur, Sarai Ahmed, and Taimurpur show 0% usage, indicating a complete absence of mosaic or floor tiles in these areas. Overall, these tables collectively offer a detailed perspective on the prevalence of different floor building materials across various villages, highlighting regional variations and providing valuable insights for construction planning, resource allocation, and infrastructure development in rural areas.

References

- Census of India, 2011.
- Dana, K., & Das, S. K. (2002). Some studies on ceramic body compositions for wall and floor tiles. *Transactions of the Indian Ceramic Society*, *61*(2), 83-86.
- Das, S. K., Ghosh, J., Mandal, A. K., Singh, N., & Gupta, S. (2012). Iron ore tailing: A waste material used in ceramic tile compositions as alternative source of raw materials. *Transactions of the Indian ceramic society*, *71*(1), 21-24.

- Ghosh, S., Pal, K. S., Dandapat, N., Ghosh, J., & Datta, S. (2013). Glass-ceramic glazes for future generation floor tiles. *Journal of the European Ceramic Society*, *33*(5), 935-942.
- Madhumathi, A., Vishnupriya, J., & Vignesh, S. (2014). Sustainability of traditional rural mud houses in Tamilnadu, India: An analysis related to thermal comfort. *Journal of Multidisciplinary Engineering Science and Technology*, *1*(5), 302-311.
- Mishra, S. (2017). Thermal Performance Evaluation of Mud House for Ghaziabad Composite Climate. *Vivechan Int J Res*, *8*(1), 45-55.
- Namkane, K., Naksata, W., Thiansem, S., Sooksamiti, P., & Arqueropanyo, O. A. (2016). Utilization of coal bottom ash as raw material for production of ceramic floor tiles. *Environmental Earth Sciences*, *75*, 1-11.
- Pappu, A., Saxena, M., & Asolekar, S. R. (2007). Solid wastes generation in India and their recycling potential in building materials. *Building and environment*, *42*(6), 2311-2320.
- Ravi, R., & Lahoti, K. (1990). Building materials.