

## Exploring place attachment: Insights from post-Gorkha earthquake resettlement planning in Nepal

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### Abstract

*This study investigates the relationship between place attachment and resettlement planning in Nepal post the Gorkha Earthquake of 2015. Focusing on functional place dependence, it analyses place attachment within the Panipokhari Integrated Settlement, designed for the Thami community in Dolakha district. Using "residential satisfaction" as a parameter to measure the influencing factors of place dependence, data were collected through a Likert scale survey, interviews, and observations. The analysis encompassed Cronbach's Alpha for reliability ( $\alpha = 0.825$ ), mean satisfaction scores for evaluation, and Spearman's rank correlation to explore relationships between residential satisfaction parameters and place dependence factors. The study revealed significant correlations, highlighting varied influences on place attachment. Notably, social connectivity, represented by nearness to relatives ( $r = 0.720, p = 0.000$ ), exhibited a strong positive correlation. Similarly, infrastructure amenities like electricity ( $r = 0.532, p = 0.000$ ) displayed a relatively strong positive correlation, while access to health facilities ( $r = 0.447, p = 0.002$ ) demonstrated a moderate positive correlation. Moreover, settlement planning components—kitchen gardens ( $r = 0.623, p = 0.000$ ), open spaces ( $r = 0.578, p = 0.000$ ), settlement layout ( $r = 0.549, p = 0.000$ ), and cattle sheds ( $r = 0.574, p = 0.000$ )—significantly correlated with increased attachment. Additionally, housing design factors like immediate exterior spaces ( $r = 0.730, p = 0.000$ ), spaces for life cycle rituals ( $r = 0.771, p = 0.000$ ), and social events ( $r = 0.663, p = 0.000$ ) and building performance factor winter thermal comfort ( $r = 0.606, p = 0.000$ ) displayed substantial positive correlations. Acknowledging study limitations, it offers insights for planners and policymakers, stressing holistic approaches for sustainable resettlement. Future research should explore diverse factors and contexts,*

*emphasizing the dynamic nature of place dependence. Ultimately, the study underscores the intricate relationship between satisfaction parameters and place attachment, urging comprehensive resettlement strategies.*

*Keywords: place attachment, place dependence, residential satisfaction, integrated settlement, post-disaster resettlement*

## **Introduction**

In the aftermath of disasters, resettlement initiatives have sought to provide stability for displaced populations. Over the past decade, disasters have led to a staggering global total of 60.9 million displacements, including 32.6 million (53%) internally caused by such events (IDMC, 2023). Among these strategies, resettlement is a prominent measure, involving planned relocation to introduce new environments for affected communities (Gaillard, 2015; Sridarran *et al.*, 2018). However, these efforts often result in unoccupied settlements, attributed to factors like inadequate "place attachment" and "residential dissatisfaction." While research on place attachment in post-disaster resettlement is limited, extensive knowledge exists on residential satisfaction. Within the literature on place attachment, scholars emphasize two key aspects: social/emotional place identity and functional place dependence (Gunderson & Watson, 2007; Lin & Lockwood, 2014). In the context of post-disaster resettlement, while both dimensions are relevant, the primary focus often centers on functional place dependence. This aspect highlights how affected households depend on the relocated place to meet their immediate infrastructure needs. When these needs are not adequately met, it can lead to dissatisfaction with the residence, impacting long-term place attachment and successful resettlement outcomes. Therefore, residents' satisfaction plays a critical role concerning various factors influencing place attachment.

Research on place attachment in disaster contexts has expanded (Greer *et al.*, 2019), yet its exact definition remains a point of contention. Previous studies have explored how disasters shape place attachments and influence responses (Adie, 2020). However, the relationship between user satisfaction and place attachment in disaster-related resettlement planning lacks comprehensive exploration (KamacI-Karahan & Kemeç, 2022). While establishing a direct link between individual satisfaction and place attachment is challenging, various researchers (Bonaiuto *et al.*, 1999; Fleury-Bahi *et al.*, 2008) suggest a potential relationship or independence between the two. Though satisfaction might reflect the gap between actual and desired needs, reconciling this gap may impact place attachment and user well-being (Bowlby, 1969; Galster, 1987; Low, 1992).

The aftermath of the Gorkha Earthquake, which resulted in approximately 20,000 landslides, led to the relocation of 4079 families from 21 affected districts and 99 local governments in Nepal. Despite these efforts, as observed in other nations, many settlements, including the Panipokhari Integrated Settlement housing displaced Thami households, remained unoccupied. Existing studies (He, 2019; Rieger, 2021; Shrestha, 2023) investigating these issues have overlooked the crucial aspect of place attachment. This study aims to fill this gap by using residential satisfaction as a metric to explore factors influencing place attachment within the Panipokhari Integrated Settlement. Focusing on variables of functional place dependence, the research employs a mixed-method approach involving quantitative and qualitative analyses to understand place attachment in this unique cultural context. The insights gained could offer guidance for policymakers and researchers engaged in effective resettlement planning. This is particularly significant for Nepal, a region highly susceptible to seismic events, ranking 11th globally in vulnerability, facing the 30th highest vulnerability to floods, and ranked 4th in vulnerability to climate change (Ministry of Home Affairs & Disaster Preparedness Network-Nepal, 2015).

### **Place attachment and residential satisfaction: Resettlement contexts**

Across academic disciplines, the precise definition of place attachment remains diverse and contested (Hernandez *et al.*, 2014) since concepts related to place encompass various dimensions such as sense of place, place dependence, and place identity. Regardless of the varied terms used to signify place attachment, it represents the positive emotional connection formed between individuals and their environment. According to Altman & Low (1992), place attachment can broadly be understood as the emotional or affective bond that develops with specific locations. The concept of place attachment integrates elements of place identity and dependence, social bonding, and biophysical connections (Raymond *et al.*, 2010). Culturally, according to Low (1992) place attachment is a shared emotional bond formed between people and a specific space, influencing their environmental connection whereas psychologically, it's the emotional and cognitive link an individual establishes with a setting, binding them to it based on their experiences.

Scholars have identified several dimensions of place attachment as place identity, place dependence, neighborhood quality, and detachment (Greer & Trainor, 2021). It is defined as having social/emotional place identity and functional place dependence (Gunderson & Watson, 2007; Lin & Lockwood, 2014). According to Raymond *et al.*, (2010), 'place identity and dependence' refer to highly personalized connections to a specific place, encompassing an individual's sense of belonging and reliance on that location, contributing significantly to the broader construct of 'place attachment.' In the

context of disaster-induced resettlement, Blondin's insight (Blondin, 2021) regarding place attachment sheds light on why individuals or communities may opt against migration despite facing significant risks. This concept aligns with Tuan's perspective (Tuan, 1977), suggesting that the 'sense of place' emerges from human interpretations and experiences, evolving spaces into meaningful 'places' over time.

### **Variables of place dependency and residential satisfaction**

In the context of place attachment, physical attributes, and resources form a diverse spectrum of variables defining a place's significance. These encompass topography, climate, natural resources like water and forests, infrastructure quality such as roads and buildings, land utilization for agriculture or residential purposes, access to amenities, landscapes, architecture, environmental conditions, and safety considerations against natural disasters or crime. Together, these facets contribute to the physical aspects that individuals attach to within a specific place. In post-disaster resettlement scenarios, these variables encapsulate the dimensions of residential satisfaction, often synonymous with user or housing satisfaction. Studies across diverse resettlement types identify several variables linked to place attachment and dependence. For instance, Qiu *et al.*, (2020) emphasize the significance of local functional dependence and social interactions in enhancing residential satisfaction in development-induced resettlement in Guangzhou, China. Xu *et al.*, (2021) explore primary and secondary dimensions of place dependence, identifying six influential factors impacting satisfaction parameters, ranging from land requisition policy to community inclusion. Similarly, Prayitno *et al.*, (2021) examine variables like origin, land ownership, environmental quality, and accessibility, assessing social factors of place dependence and changes in land use in sustainable agriculture.

At the dwelling level, several factors significantly impact post-disaster residential satisfaction. These encompass the length of stay, access to utilities and infrastructure, livelihood restoration, and location suitability (Danquah *et al.*, 2014). Scholars also stress the significance of house layouts for daily activities and reinstating socio-economic and cultural elements (Prasanna *et al.*, 2016). Furthermore, adherence to local climatic conditions, influencing settlement locations, housing design, and thermal comfort, leads to varying satisfaction levels among resettled communities (Carrasco *et al.*, 2017). In post-disaster resettlement studies, researchers have explored diverse facets of residential satisfaction. Mohit and Raja (2014) introduced a framework encompassing social, physical, and neighborhood components, while Manatunge & Abeyasinghe (2017) discussed environmental and social criteria such as job opportunities and neighborhood facilities. Additionally, Hadlos (2021) identified four dimensions of satisfaction, including site characteristics and the social environment. This literature hints at a complex relationship between residential satisfaction and place attachment, exploring

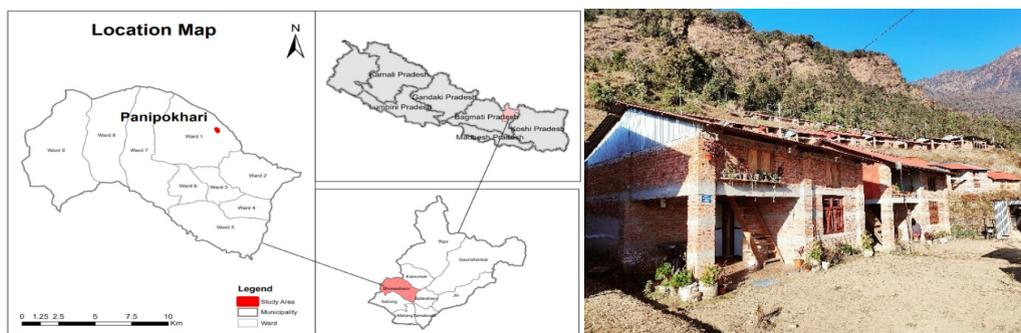
potential links or independence between the two (Bonaiuto *et al.*, 1999). Stedman's (2003) conceptualization aligns attachment with identity and satisfaction with attitude, while Cuaton (2019) highlights the challenge of severing social ties during relocations, impacting belongingness and health concerns.

## Methodology

The Panipokhari Integrated Settlement in Dolakha district (Figure 1) was chosen for a case study due to its severe impact from the 2015 Gorkha earthquake in Nepal. The Panipokhari Integrated Settlement (PIS) was planned in 39,642 square meters of government land following the 2015 Gorkha earthquake to relocate 56 households from Bosimpa and Buma villages. Buma is located close to PIS, while Bosimpa is an hour's distance away. Thami communities, practicing animism and shamanism, reflected their social and cultural lives in their scattered settlement, rather than clustering their houses (Shneiderman & Turin, 2006). The PIS featured uniform, two-story houses with kitchens on the ground floor and bedrooms/storage upstairs, constructed with brick and CGI roofing. Despite completion, only 30% of households have moved in, leaving many homes unoccupied.

**Figure 1**

*Panipokhari integrated settlement*



A mixed method approach was used for the study as emphasized by Lewicka (2011) who states combining quantitative (quantity) and qualitative (meaning) methods in place attachment research to provide comprehensive insights into people's bonds with places. This study measured residential satisfaction to assess factors influencing place attachment in 46 relocated households from Buma and Bosimpa. Using Likert scale questionnaires in Nepali, the study identified 25 critical factors affecting residential satisfaction, validated through a robust Cronbach's Alpha test result of 0.825. SPSS

software was used for data analysis, supplemented by direct observations and qualitative interviews, which, according to Creswell (2015), serve as a complement to mixed-method approaches. Interviews enhance quantitative studies and reveal evolving attachments and social impacts (Livingston et al., 2008). The Relative Importance Index and Spearman's rank correlation coefficient were employed to understand complex relationships among satisfaction parameters impacting households' place dependence.

## **Results and discussion**

The socio-demographic profile of the Thami households shows that the majority of respondents hailed from the Bosimpa settlement (65.2%), followed by a smaller proportion from Buma (32.6%), and a negligible presence from other locations (2.2%). The data indicates a male predominance (71.7%) compared to females (28.3%). Age-wise, there is a notable presence in the 30-44 years and 45-59 years age groups, each comprising 32.6%, followed by 45-59 years (28.3%), and a smaller representation in the 15-29 years category (6.5%). Marital status predominantly reflects married individuals (95.7%), with only a small proportion being unmarried (2.2%) or widowed (2.2%). Regarding education, a notable proportion is either illiterate (43.5%) or possess basic education up to grade eight (45.6%), while a smaller percentage has completed secondary education (10.9%). Occupation-wise, a significant majority are engaged in agriculture or livestock-related activities (52.2%), followed by a smaller percentage in labor (13.0%), business (10.9%), and various other occupations (15.2%). The average household expenditure is reported at NPR 15,000, slightly lower than the average income of NPR 20,000. Cattle ownership is prevalent among 67.4% of households.

### **Residential satisfaction**

The literature review highlighted the crucial role of residential satisfaction parameters in shaping functional place dependence for place attachment. Analyzing mean satisfaction scores and the Relative Importance Index (RII) for various residential satisfaction parameters (Table 1) in the Panipokhari Integrated Settlement provided essential insights. Neighborhood-related determinants like proximity to previous housing (2.28) and access to farmland (2.2) received lower mean satisfaction scores, reflecting moderate RII values (0.46 and 0.44, respectively). This suggests dissatisfaction among residents, critical for continuity and livelihood. Infrastructure-related factors such as road access (3.15), sanitation and drainage (3.26), and access to educational facilities (3.04) obtained higher mean satisfaction scores, with substantial RII values (ranging from 0.52 to 0.65). This underscores their significant influence on residents' satisfaction and their perceived importance of a supportive living environment

Site planning elements like settlement layout (2.17) and provision of open space (3.17) showed mixed satisfaction scores and RII values, indicating differing levels of resident satisfaction. Housing design aspects such as immediate exterior space (1.91), house size (1.8), and house layout (2.09) received lower satisfaction scores, suggesting potential areas for improvement to enhance resident comfort and attachment to their homes. Socio-cultural aspects like spaces for life cycle rituals (2.31), social events (2.57), and daily religious and social activities (ranging from 2.02 to 2.52) displayed moderate to higher satisfaction scores, highlighting their significance in fostering community belonging. Regarding building performance, summer thermal comfort (2.26) received higher satisfaction compared to winter (1.87), signaling a need for improved building design and insulation for colder seasons. These findings emphasize the crucial role of various neighborhood and housing factors in shaping resident satisfaction and place dependence within the settlement, indicating avenues for strengthening place attachment among residents.

### **Place attachment and residential satisfaction**

Stedman's study (Stedman, 2003) indicated a positive yet modest correlation between place attachment and satisfaction scales. The correlation analysis conducted for residential satisfaction parameters and their impact on functional place dependence within the Panipokhari Integrated Settlement provides crucial insights into their relationship. This analysis highlights both statistically significant findings ( $p \leq 0.05$ ) and insignificant ones ( $p > 0.05$ ), detailed in Table 1. The specific correlation values shed light on the multifaceted influences of various residential satisfaction parameters on functional place dependence, emphasizing nuanced factors contributing to residents' attachment within the Panipokhari Integrated Settlement. These findings are further discussed in terms of housing and neighborhood components of the residential satisfaction influencing place attachment.

### ***Housing***

The analysis revealed significant positive correlations between functional place dependence for place attachment among households and factors related to housing components, as opposed to those associated with the neighborhood component. Notably, the results highlighted significant correlations linked to factors influencing the utilization of interior spaces within the houses. Specifically, significant correlations were observed in factors related to interior spaces, such as interior spaces for life cycle rituals ( $r = 0.771$ ;  $p = 0.000$ ), interior spaces for everyday religious activity ( $r = 0.754$ ;  $p = 0.000$ ), interior spaces for social events ( $r = 0.663$ ), interior spaces for family interactions ( $r = 0.606$ ), winter thermal comfort ( $r = 0.600$ ), space for traditional fire hearth ( $r = 0.590$ ), layout of the house ( $r = 0.587$ ), interior spaces for everyday social activities ( $r = 0.571$ ),

and space for addition/modification of the house ( $r = 0.548$ ). This strongly indicates that the place attachment to the new resettlement site was influenced by the design and spatial planning of the interior spaces.

**Table 1**

*Residential satisfaction of the post-disaster resettled households*

	Deter minant	Factors	Mean Satisfaction Score	RII	Correlation Coefficient (r)	Sig. (p)
Neighbourhood	Locational attribute	Proximity to previous housing	2.28	0.46	.382**	0.009
		Access to farmland	2.2	0.44	.398**	0.006
		Nearness to relatives (social connection)	2.89	0.58	.720**	0.000
		Road Access	3.15	0.63	.382**	0.009
	Infrastructure and services	Provision of drinking water	2	0.40	.395**	0.007
		Provision of electricity	2.61	0.52	.532**	0.000
		Provision of sanitation and drainage	3.26	0.65	.370*	0.011
		Access to health facilities	2.76	0.55	.447**	0.002
	Site planning	Access to educational facilities	3.04	0.61	0.256	0.086
		Settlement layout	2.17	0.43	.549**	0.000
Provision of open space		3.17	0.63	.578**	0.000	
Cattle sheds for livestock		1.96	0.39	.574**	0.000	
Housing	Housing design	Provision of kitchen garden	1.46	0.29	.623**	0.000
		Size of house	1.8	0.36	.429**	0.003
		Layout of house	2.09	0.42	.587**	0.000
	Socio-cultural	Space for traditional fire hearth	2.09	0.37	.590**	0.000
		Space for addition/ modification of house	1.78	0.36	.548**	0.000
		Immediate exterior space	1.91	0.38	.730**	0.000
Building performance	Interior spaces	Interior spaces for life cycle rituals	2.31	0.45	.771**	0.000
		Interior spaces for social events	2.57	0.51	.663**	0.000
		Interior spaces for everyday religious activity	2.52	0.50	.754**	0.000
		Interior spaces for everyday social activities	2.37	0.47	.571**	0.000
Building performance	Winter Thermal comfort	Interior spaces for family interactions	2.02	0.40	.606**	0.000
		Summer Thermal comfort	2.26	0.45	.600**	0.000
			1.87	0.37	.335*	0.023

Housing plans deeply rooted in cultural aspects, religious observances, and familial connections significantly enhance place attachment. Research shows that layouts fostering community interaction and social bonds notably bolster this attachment. However, a study revealed that standardized permanent houses failed to consider individual household characteristics and cultural needs, leading to dissatisfaction among residents. Unlike traditional vernacular houses, these new structures neglected socio-cultural requirements, resulting in low satisfaction scores. According to Shneiderman (2009), for the Thami community, houses represent more than mere shelter; they embody social and cultural life, shaping daily experiences, and connections with their spiritual world, and serving as an identity cornerstone. These homes delineate Thami domestic spaces and define relationships with their territorial and clan deities. Housing plans accommodating cultural and social aspects significantly impact place attachment. Designs fostering community interaction strengthen this bond, yet recent standardized houses overlooked individual needs, causing dissatisfaction. The uniform prototype permanent houses lacked consideration for diverse household lifestyles, contrasting with pre-earthquake vernacular houses that adeptly met socio-cultural needs.

This oversight resulted in notably low satisfaction scores, with residents expressing dissatisfaction due to inadequate socio-cultural provisions in layout and interior spaces. In the Thami community, houses signify more than mere living spaces—they embody their social and cultural life, shaping their identity and connections with the divine world. These homes serve as the foundation of their identity, defining a unique Thami living space that influences daily life and connections with territorial deities, showcasing the crucial role of housing in shaping their lives and preserving culture. According to Shneiderman and Turin (2006), Thami's ritual life is centered around life cycle events rather than structured deity worship. Essential rituals regarding birth, marriage, and death within Thami households underscore the significance of 'bampa,' a vertically positioned flat rock (Shneiderman, 2009). Unlike distinct religious objects, most Thami rituals involve everyday items. The hearth, king post, and 'bampa' carry cultural weight during these rituals, symbolizing specific meanings tied to cultural beliefs. An emotionally charged respondent, celebrating her son's marriage, vividly expressed the importance of these rituals.

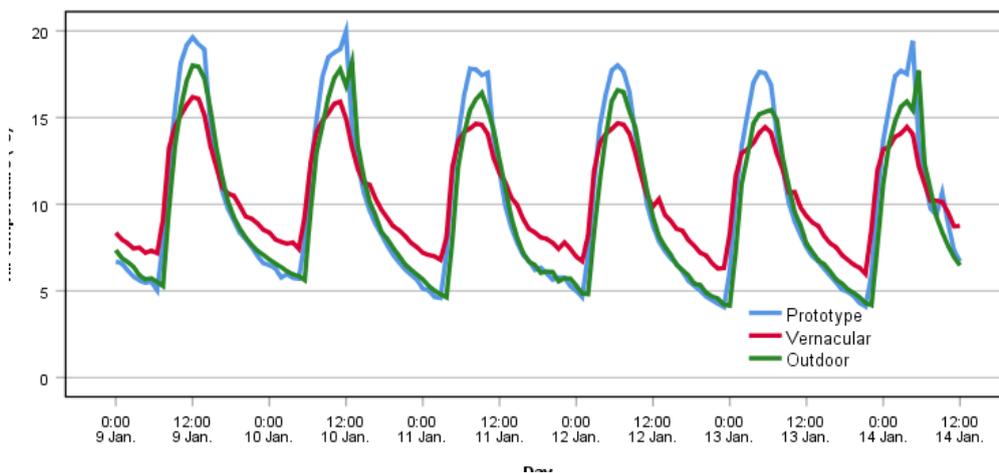
*“The hearth, marked by our bampa, was a crucial element in our household. It played a vital role in performing our life cycle rituals. We used to circumambulate around it before and sometimes after completing our rituals. But now, it's absent in our new house. During my son's wedding, I had to make do with a temporary metal fire pot inside the house. However, the ritual felt incomplete without it”*



The study emphasizes thermal comfort as crucial for various household activities, including indoor environmental comfort and food grain storage. Unlike the housing in the study area, vernacular houses, designed with local climate considerations, provided better thermal comfort. However, households expressed dissatisfaction with the thermal performance of their new houses, corroborating observations made by Kurum Varolgunes (2021) and Tharim *et al.*, (2021). Dias *et al.*, (2016) and Dikmen & Elias-Ozkan (2004) have also indicated that households may be discontented with the use of inappropriate materials such as concrete and CGI roofing, leading to colder interiors. Temperature measurements in Figure 3 show indoor air temperatures in prototype houses dropping below outdoor nighttime temperatures during winter. This dissatisfaction notably impacts households' attachment to the resettlement site.

**Figure 3**

*Weekly outdoor and indoor air temperature variation of prototype and vernacular house (Shrestha, 2023)*



Moreover, the Thami community often spends considerable time outdoors, engaging in agricultural tasks or using the immediate exterior space around their houses. Vernacular houses had a semi-open 'veranda,' serving various functions under their roof—ranging from sunbathing to agricultural work like corn shucking and hosting guests. These houses also incorporated essential structures like storage units, animal sheds, and kitchen gardens around the house. However, the smaller plot size of the new houses, around 160 sq.m, significantly limits the space for rural families heavily involved in agriculture. As a result, households likened the new house's size to that of a chicken coop and expressed dissatisfaction with the limited immediate exterior space available.

### **Neighbourhood**

In the domain of neighborhood attributes, significant positive correlations were evident for factors such as nearness to relatives (social connection) ( $r = 0.720$ ;  $p = 0.000$ ) indicating that the closeness of households to their relatives significantly influenced their attachment to the settlement. This suggests that social ties and connections within the neighborhood play a pivotal role in fostering a sense of belonging among residents, reinforcing the importance of social proximity in shaping their attachment to the area. The close proximity provided by resettlement they thought was very important for it provided them a sense of security that was not there in the previous location where they lived in a scattered settlement as expressed by one of the respondents:

*"We had no idea who had passed away in the village after the earthquake because our houses were scattered in the previous village. The resettlement site is a good thing. Now, at least, we can know about each other and cooperate during disasters. Living together, we feel more secure"*

Similarly, the provision of essential services such as electricity ( $r = 0.532$ ;  $p = 0.000$ ) and access to health facilities ( $r = 0.447$ ;  $p = 0.002$ ) indicated a positive correlation. This improvement has alleviated the community's prior challenges with unreliable electricity supply and distant access to health services in their previous location. Moreover, the correlation analysis revealed a positive association between functional place dependence and access to drinking water ( $r = 0.395$ ;  $p = 0.007$ ). The community in the resettled site now has better, adequate, and accessible clean drinking water, which significantly influenced their attachment to the settlement as noted by one of the women:

*"The better infrastructure here is a blessing. It saves us so much time and effort, especially for water. Back in the village, the water supply was unreliable. Here, it's good, and so are the other facilities."*

The moderately positive correlations noted for proximity to previous housing ( $r = 0.382$ ;  $p = 0.009$ ) and road access ( $r = 0.382$ ;  $p = 0.009$ ) indicate that these factors contribute moderately to residents' attachment to the settlement. This suggests that the familiarity and accessibility of the previous housing and roadways significantly influence residents' connection to their current settlement. Moreover, in the domain of site planning, several elements demonstrated noteworthy positive correlations with functional place dependence. Notably, the provision of kitchen gardens ( $r = 0.623$ ;  $p = 0.000$ ), open space availability ( $r = 0.578$ ;  $p = 0.000$ ), cattle sheds for livestocking ( $r = 0.574$ ;  $p = 0.000$ ), and settlement layout ( $r = 0.549$ ;  $p = 0.000$ ) showed strong associations indicating the role of careful site planning in fostering residents' attachment

to the settlement. It implies that well-designed spaces for agricultural purposes, open areas, livestock facilities, and settlement layouts significantly contribute to residents' place attachment within the resettlement area.

As an agrarian community, farming and livestock activities constituted the primary source of livelihood for affected households. However, the resettlement site lacked proximity to arable land, necessitating a journey of at least an hour to reach their farmlands and cattle shelters in their previous location. The settlement's planning overlooked even the provision of spaces for kitchen gardens, as households were allocated plots of about 160 sq.m, insufficient for a rural family reliant on agriculture. Due to the absence of kitchen gardens, households expressed dissatisfaction, noting that they had to travel back to their former villages of Bosimpa every day to cultivate and obtain vegetables. Moreover, many resettled households admitted to returning to their previous residences for several days, and sometimes even weeks, particularly during the farming season. A respondent in their mid-fifties shared:

*This house feels more like a rented place in the city. We only have rooms and no space for our animals or even a small kitchen garden. Our livestock and farmland are still in Bosimpa, so we just come here to sleep. But during the farming season, we spend several days, sometimes even weeks, in Bosimpa."*

The absence of space for cattle sheds for livestock at the resettled site was attributed to the government implementing agency's and community leaders' perspectives. They believed that including such facilities would compromise the settlement's aesthetics and its primary objective of becoming a model site, resulting in strict restrictions on their construction. A community leader expressed this viewpoint:

*"If we allowed households to keep their animals here, it would be just like the old village. That's not something we can promote as a model settlement."*

Despite this perspective, the community faced challenges maintaining their livestock, which remained in the old village and were vulnerable to wildlife attacks from nearby forests. Interestingly, some households in the study area adapted by creating spaces for chicken coops and beekeeping, modifying existing house settings. However, the new houses, neighborhood, and resettlement site largely failed to address the psychological, social, and cultural needs of the vulnerable indigenous community. Household dissatisfaction led to reduced place dependence and a reluctance to stay. According to Anton and Lawrence (2014), individuals only become dependent on a new place if it

fulfills their needs. However, the Panipokhari Integrated Settlement fell short of meeting the social, cultural, and daily requirements of these households. This shortfall made forming emotional bonds with the houses or neighborhood challenging, as highlighted by Low (1992), who emphasizes that place attachment encompasses cultural beliefs and practices connecting people to their place. Unfortunately, the layout and interior of the houses in Panipokhari do not support these cultural aspects, resulting in a weak negative attachment to the settlement (Anton & Lawrence, 2014; Low, 1992). Both interior and exterior spaces within the houses seem disconnected from the community's cultural needs, leading to a continued functional attachment to their old village and houses. This aligns with Xiang et al. (2023), who observed that individuals who have experienced large-scale disasters often grapple with uncertainty and struggle to rebuild place attachment in a new settlement.

## **Conclusion**

The study investigated the relationship between residential satisfaction factors and functional place dependence within the Panipokhari Integrated Settlement, analyzing 25 critical factors associated with neighborhood and housing satisfaction. Various measures like mean satisfaction scores, the relative importance index, correlation coefficients, and significance values were used to assess their connections. The outcomes revealed notable correlations between specific factors and functional place dependence. Social connectivity represented by nearness to relatives, housing design factors like immediate exterior spaces, spaces for life cycle rituals, and social events, along with the building's winter thermal comfort performance, displayed strong correlations compared to infrastructure amenities. The practical significance of these outcomes underscores the critical role of social connectivity, housing design factors, building performance, and infrastructure availability in shaping residents' attachment to their living environment.

However, the study's narrow focus on specific determinants within a single resettlement site may overlook other influential factors in place dependence, limiting the generalizability of findings to diverse contexts. Nevertheless, its insights benefit urban planners, policymakers, and community leaders engaged in various resettlement projects. Understanding multifaceted place attachment informs better strategies, emphasizing social ties, services, and functional spaces to enhance residents' connection to new environments. Future research should encompass various determinants and explore place attachment dynamics across diverse contexts. Longitudinal studies tracking residents' evolving perceptions of resettlement sites could offer deeper insights.

## References

- Adie, B.A. (2020). Place attachment and post-disaster decision-making in a second home context: a conceptual framework. *Current Issues in Tourism*, 23(10), 1205–1215. <https://doi.org/10.1080/13683500.2019.1600475>
- Altman, I., & Low, S.M. (1992). Place attachment. In: Altman, I., Low, S.M. (eds.) *Place attachment. Human behavior and environment, vol 12*. Springer, Boston, MA. [https://doi.org/10.1007/978-1-4684-8753-4\\_1](https://doi.org/10.1007/978-1-4684-8753-4_1)
- Blondin, S. (2021). Staying despite disaster risks: Place attachment, voluntary immobility and adaptation in Tajikistan's Pamir Mountains. *Geoforum*, 126, 290–301. <https://doi.org/10.1016/j.geoforum.2021.08.009>
- Bonaiuto, M., Aiello, A., Perugini, M., Bonnes, M., & Ercolani, A.P. (1999). Multidimensional perception of residential environment quality and neighborhood attachment in the urban environment. *Journal of Environmental Psychology*, 19, 331–352.
- Bowlby, J. (1969). *Attachment and loss vol. 1*. Penguin Books, pp. 1-484.
- Carrasco, S., Ochiai, C., & Okazaki, K. (2017). Residential satisfaction and housing modifications: A study in disaster-induced resettlement sites in Cagayan de Oro, Philippines. *International Journal of Disaster Resilience in the Built Environment*, 8(2), 175–189. <https://doi.org/10.1108/IJDRBE-09-2015-0043/FULL/XML>
- Creswell, J. W. (2015). *A concise introduction to mixed methods research*. SAGE Publications, Inc.
- Cuaton, G. P. (2019). Post-disaster relocation of urban coastal communities in the Philippines. *Andalus Journal of International Studies*, 8(2), 143–153.
- Danquah, J., Attippoe, A.J., & Ankrah, J. (2014). Assessment of residential satisfaction in the resettlement towns of the Keta Basin in Ghana. *International Journal Civil Engineering. Construction and Estate Management*, 2(3), 26–45. <http://www.eajournals.org/wp-content/uploads/Assessment-Of-Residential-Satisfaction-In-The-Resettlement-Towns-Of-The-Keta-Basin-In-Ghana.pdf>. Accessed: 25.06.2023.
- Dias, N.T., Keraminiyage, K., & DeSilva, K.K. (2016). Long-term satisfaction of post disaster resettled communities: The case of post tsunami – Sri Lanka. *Disaster Prevention and Management*, 25(5), 581–594. <https://doi.org/10.1108/DPM-11-2015-0264>

- Dikmen, N., & Elias-Ozkan, S.T. (2004). Post-disaster housing in rural areas of Turkey. *Second International Conference on Post-Disaster Reconstruction in Developing Countries*. pp. 1-14
- Fleury-Bahi, G., Félonneau, M.L., & Marchand, D. (2008). Processes of place identification and residential satisfaction. *Environment and Behavior*, 40(5), 669–682. <https://doi.org/10.1177/0013916507307461>
- Gaillard, J. C. (2015). Post-disaster resettlement. In: Gaillard, J.C. (ed.) *People's response to disasters in the Philippines*. pp.143-155. <https://doi.org/10.1057/9781137484291>
- Galster, G. (1987). Identifying the Correlates of Dwelling Satisfaction: An Empirical Critique. *Environment and Behavior*, 19(5), 539–568. <https://doi.org/10.1177/0013916587195001>
- Greer, A., Binder, S.B., Thiel, A., Jamali, M., & Nejat, A. (2019). Place attachment in disaster studies: measurement and the case of the 2013 Moore tornado. *Population and Environment*, 41, 306–329. <https://doi.org/10.1007/s11111-019-00332-7>
- Greer, A., & Trainor, J.E. (2021). A system disconnected: perspectives on post-disaster housing recovery policy and programs. *Natural Hazards*, 106(1), 303–326. <https://doi.org/10.1007/s11069-020-04463-1>
- Gunderson, K., & Watson, A. (2007). Understanding place meanings on the Bitterroot National Forest, Montana. *Society and Natural Resources: An International Journal*, 20, 705–721. <https://doi.org/10.1080/08941920701420154>
- Hadlos, A. (2021). Determining the depth of households' participation influencing the level of their residential satisfaction in a post-Haiyan resettlement. *International Journal of Disaster Risk Reduction*, 64(March), 102490. <https://doi.org/10.1016/j.ijdr.2021.102490>
- He, L. (2019). Identifying local needs for post-disaster recovery in Nepal. *World Development*, 118, 52–62. <https://doi.org/10.1016/j.worlddev.2019.02.005>
- Hernandez, B., Hidalgo, M. C., & Ruiz, C. (2014). Theoretical and methodological aspects of research on place attachment. In: L. C. Manzo & P. Devine-Wright (eds.), *Place Attachment: Advances in Theory, Methods and Applications* (First). Routledge Taylor & Francis Group, pp. 125–137
- IDMC. (2023). *Grid 2023: Internal displacement and food security*. <https://www.internal-displacement.org/global-report/grid2023/>. Accessed: 25.06.2023

- KamacI-Karahan, E., & Kemeç, S. (2022). Residents' satisfaction in post-disaster permanent housing: Beneficiaries vs. non-beneficiaries. *International Journal of Disaster Risk Reduction*, 73(January), 102901. <https://doi.org/10.1016/j.ijdr.2022.102901>
- Kurum Varolgunes, F. (2021). Success factors for post-disaster permanent housing: Example of Turkish Earthquakes. *Turkish Online Journal of Design Art and Communication*, 11(1), 115–130. <https://doi.org/10.7456/11101100/007>
- Lewicka, M. (2011). Place attachment: How far have we come in the last 40 years? *Journal of Environmental Psychology*, 31, 207–230. <https://doi.org/10.1016/j.jenvp.2010.10.001>
- Lin, C.C., & Lockwood, M. (2014). Forms and sources of place attachment: Evidence from two protected areas. *Geoforum*, 53, 74–81. <https://doi.org/10.1016/j.geoforum.2014.02.008>
- Livingston, M., Bailey, N., & Kearns, A. (2008). *People's attachment to place - The influence of neighbourhood deprivation*. Chartered Institute of Housing/ Joseph Rowntree Foundation. <https://api.semanticscholar.org/CorpusID:141233287>. Accessed: 030.06.2023
- Low, S.M. (1992). Symbolic ties that bind: Place attachment in the plaza. In: I. Altman & S. M. Low (eds.), *Place Attachment*, Plenum Press, pp. 165–166.
- Manatunge, J.M.A., & Abeysinghe, U. (2017). Factors affecting the satisfaction of post-disaster resettlers in the long term: A case study on the resettlement sites of tsunami-affected communities in Sri Lanka. *Journal of Asian Development*, 3(1), 94. <https://doi.org/10.5296/jad.v3i1.10604>
- Ministry of Home Affairs, & Disaster Preparedness Network-Nepal. (2015). *Nepal disaster report 2015*. [http://reliefweb.int/sites/reliefweb.int/files/resources/1293600-World-Disasters-Report-2015\\_en.pdf](http://reliefweb.int/sites/reliefweb.int/files/resources/1293600-World-Disasters-Report-2015_en.pdf). Accessed: 30.06.2023
- Mohit, M.A., & Raja, A.M.M.A.K. (2014). Residential satisfaction-Concept, theories and empirical studies. *Planning Malaysia*, 12(September), 47–66. <https://doi.org/10.21837/pmjournal.v12.i3.131>
- National Statistics Office. (2023). *National Population and Housing Census 2021*. National Population and Housing Census 2021. <https://censusnepal.cbs.gov.np/results>. Accessed: 30.06.2023
- Prasanna, J., Wijegunaratne, E., & Wedawatta, G. (2016). *Study on key performance indicators to investigate long-term performance of post-disaster housing*. pp. 226–234. [https://publications.aston.ac.uk/id/eprint/32121/1/Study\\_on\\_](https://publications.aston.ac.uk/id/eprint/32121/1/Study_on_)

key\_performance\_indicators\_to\_investigate\_long\_term\_performance.pdf.  
Accessed: 25.06.2023

- Prayitno, G., Rukmi, W.I., & Ashari, M.I. (2021). Assessing the social factors of place dependence and changes in land use in sustainable agriculture: Case of Pandaan District, Pasuruan Regency, Indonesia. *Journal of Socioeconomics and Development*, 4(1), 8–20. <https://doi.org/10.31328/jsed.v4i1.1720>
- Qiu, J., Liu, Y., Xian, S., Song, L., & Ru, X. (2020). Plural reciprocity vs. acquaintance society: Place attachment and residential satisfaction under development-induced resettlement differences in Guangzhou, China. *Sustainability*, 12. <https://doi.org/10.3390/su12166444>
- Raymond, C.M., Brown, G., & Weber, D. (2010). The measurement of place attachment: Personal, community, and environmental connections. *Journal of Environmental Psychology*, 30, 422–434. <https://doi.org/10.1016/j.jenvp.2010.08.002>
- Rieger, K. (2021). Multi-hazards, displaced people’s vulnerability and resettlement: Post-earthquake experiences from Rasuwa district in Nepal and their connections to policy loopholes and reconstruction practices. *Progress in Disaster Science*, 11, 100187. <https://doi.org/10.1016/j.pdisas.2021.100187>
- Shneiderman, S. B. (2009). *Rituals of ethnicity: Migration, mixture, and the making of Thangmi identity across Himalayan borders*. Dissertation Abstracts International Section A: Humanities and Social Sciences, 123(10), 2114. [https://www.academia.edu/49732744/Rituals\\_of\\_ethnicity\\_Migration\\_mixture\\_and\\_the\\_making\\_of\\_Thangmi\\_identity\\_across\\_Himalayan\\_borders](https://www.academia.edu/49732744/Rituals_of_ethnicity_Migration_mixture_and_the_making_of_Thangmi_identity_across_Himalayan_borders)
- Shneiderman, S., & Turin, M. (2006). Revisiting Ethnography, Recognizing a Forgotten People: The Thangmi of Nepal and India. *Studies in Nepali History and Society*, 11(1), 97–181.
- Shrestha, B., Uprety, S., & Pokharel, J.R. (2023). Factors Influencing Housing Satisfaction in Post-Disaster Resettlement: A Case of Nepal. *Sustainability (Switzerland)*, 15(17). <https://doi.org/10.3390/su151712755>
- Shrestha, B., Uprety, S., Pokharel, J.R., & Rijal, H.B. (2023). Study on the Winter Thermal Environment and Thermal Satisfaction of the Post-Disaster Prototype and Vernacular Houses in Nepal. *Buildings*, 13(10). <https://doi.org/10.3390/buildings13102430>
- Sridarran, P., Keraminiyage, K., & Amaratunga, D. (2018). Enablers and barriers of adapting post-disaster resettlements. *Procedia Engineering*, 212. <https://doi.org/10.1016/j.proeng.2018.01.017>

- Stedman, R.C. (2003). Is it really just a social construction?: The contribution of the physical environment to sense of place. *Society and Natural Resources*, 16, 671–685. <https://doi.org/10.1080/08941920390217627>
- Tharim, A.H.A., Ahmad, A.C., Mohamed Saraf, M.H., & Muhammad Nasir, N.A. (2021). Satisfaction analysis of flood victims towards housing relocation scheme during post occupancy at Kuala Krai, Kelantan. *Planning Malaysia*, 19(16), 48–59. <https://doi.org/10.21837/PM.V19I16.951>
- Tuan, Y.F. (1977). *Space and place: The perspective of experience*. University of Minnesota Press. pp. 1-256
- Xiang, X., Xiao, Y., Wang, R., & Huang, H. (2023). *Leaving means better? The relationship of residential satisfaction and place attachment in post-disaster area with the mediate role of perceived risk*. <https://doi.org/10.2139/ssrn.4583426>
- Xu, G., Liu, Y., Huang, X., Xu, Y., Wan, C., & Zhou, Y. (2021). How does resettlement policy affect the place attachment of resettled farmers? *Land Use Policy*, 107(January), 105476. <https://doi.org/10.1016/j.landusepol.2021.105476>