A geo-cultural analysis of the relationship between Shitalpati craftsmanship communities and murta cultivation landscapes in Bangladesh

Asadaporn Kiatthanawat
Thailand

Fatiha Pollin
Bangladesh

Patiphol Yodsurang
Thailand

Asadaporn Kiatthanawat is a PhD candidate in the Innovative Built Environment programme and a researcher with the deliGHT (Design Lab in Gastronomy, Heritage and Tourism) at the Faculty of Architecture, Kasetsart University, Bangkok. Her research interests lie at the intersection of cultural heritage, architecture and community-based development, with a particular focus on the role of local food systems and spatial practices in shaping sustainable tourism and resilient environments.

Fatiha Pollin is the founder of Perceive, a research organisation based in Bangladesh dedicated to understanding, revealing and reimagining rural and peri-urban contexts through community engagement. Her multidisciplinary team focuses on architectural research, historical documentation, and heritage awareness, management and conservation.

Patiphol Yodsurang is an associate professor at the Faculty of Architecture, Kasetsart University, Bangkok. His research centres on riverine cultural landscapes, spiritual heritage and traditional knowledge systems, with a particular emphasis on the relationships between communities and water-based environments. He is the founder of the Riverfront Research Alliance, an interdisciplinary platform that investigates how rivers shape cultural identity, ecological resilience and social rituals across Southeast Asia.

A geo-cultural analysis of the relationship between Shitalpati craftsmanship communities and murta cultivation landscapes in Bangladesh

Asadaporn Kiatthanawat
Kasetsart University, Thailand

Fatiha Pollin
Perceive, Bangladesh

Patiphol Yodsurang
Kasetsart University, Thailand
Riverfront Research Alliance, Thailand

ABSTRACT

Shitalpati weaving, a traditional craft of Bangladesh, holds significant cultural and economic value, particularly in northeastern and southern districts such as Tangail, Sylhet, Jhalokathi and Noakhali. This study investigates the spatial relationship between Shitalpati craftsmanship communities and land use and land cover (hereafter 'LULC') characteristics, focusing on the ecological context of murta (*Schumannianthus dichotomus*) cultivation – the plant used in mat weaving. A mixed-methods approach was employed, combining geo-spatial analysis, land cover classification, and field interviews with artisans. The spatial distribution of weaving communities was mapped and overlaid on to national LULC data to examine correlations with ecological zones such as swamp forests, herb-dominated lands and rural settlements. The results reveal a strong correlation between historical murta cultivation areas and current Shitalpati activity, particularly in regions with year-round moisture. However, this connection has weakened due to land use changes, including the conversion of wetlands into farmlands and settlements. Field interviews confirm that many weavers now rely on buying murta from outside sources and outsource the processing steps, increasing production costs and reducing profit margins. Correlation analysis also shows that current Shitalpati communities are more closely aligned with agricultural zones than natural murta habitats, reflecting a growing disconnection from local resources. This study highlights the vulnerability of heritage crafts linked to ecological systems and emphasises the need for policy interventions that support habitat restoration, local cultivation, and institutional framework backing for sustainable craft livelihoods.

Keywords

Shitalpati weaving, murta cultivation, land use, traditional craftsmanship, cultural landscape, Bangladesh, macro analysis, weaving community, ecology, local resources

Introduction

Shitalpati weaving is a traditional craft deeply rooted in the cultural heritage of Bangladesh, known for producing intricately woven mats from the murta plant (*Schumannianthus dichotomus*). As an element of intangible cultural heritage, it encompasses not only the physical product but also the knowledge, skills and cultural meanings transmitted across generations. These mats also play an important role in supporting rural livelihoods (Rahman et al. 2023), particularly among communities in northeastern and southern regions such as Sylhet, Tangail, Noakhali and Jhalokathi. As part of a cultural landscape, this craft reflects the interaction between communities, ecological resources and place-

based practices. Historically, Shitalpati weaving reflects a strong connection between ecological resources and cultural practices (UNESCO 2017a). Despite its historical relevance, the craft is increasingly challenged by shifts in land use and ecological degradation. Areas once abundant in naturally growing murta are now being converted to rural settlements, monoculture farming or urban uses, which may reduce the availability of quality raw materials (Bangladesh Forest Department 2020). At the same time, external market pressures and competition from industrial materials such as plastic mats are undermining the economic viability of the craft. Efforts to revitalise traditional crafts in similar contexts, such as the Murad Khane project in Kabul, have shown that integrated vocational training and community-based restoration can effectively strengthen heritage resilience under pressure (Kennedy 2010).

Shitalpati weaving, once closely linked to the ecological balance of Bangladesh's wetland regions, is now increasingly impacted by climate variability. Irregular rainfall, prolonged dry seasons and the shrinkage of wetlands have altered natural habitats, making local murta cultivation more difficult. As cultivation areas decline and production drops, many communities are forced to purchase murta from outside sources, leading to higher material costs, especially during certain seasons. This shift from self-reliant production to dependence on external suppliers increases transportation and labour expenses, weakening the economic sustainability of the craft (Ahmed et al. 2014). As a result, some artisans have stopped weaving altogether or rely heavily on imported murta. In parallel, the growing availability of cheaper and more durable synthetic alternatives, such as plastic mats, has intensified market competition. These substitutes appeal to consumers for their affordability and convenience, reducing traditional Shitalpati mats to niche items primarily used for cultural or tourism purposes. Under these conditions, artisans struggle to maintain material availability and competitiveness in a market that frequently undervalues handmade cultural products (Daily Sun 2021).

This study explores the spatial distribution of Shitalpati craftsmanship communities in relation to the land use and land cover characteristics across Bangladesh. It seeks to understand how environmental factors such as swamp forests, herbaceous wetlands, croplands and rural settlements influence or sustain this traditional craft. By linking geo-spatial analysis with ICH perspectives, the study highlights how spatial changes affect the continuity of knowledge, skills and cultural practices. By combining geo-spatial analysis, field validation and qualitative interviews, the research aims to identify the ecological zones historically and presently associated with Shitalpati weaving. Understanding these spatial dynamics is critical for designing conservation strategies, reinforcing cultural continuity and promoting resilient livelihoods for rural artisans amid changing landscapes. Recent scholarship emphasises the importance of integrating ICH into both formal and non-formal education frameworks, highlighting the role of intergenerational learning, vocational training and sustainable development goals as converging strategies for heritage safeguarding (Labrador 2022).



Figure 1
The growth characteristics of murta trees (*Schumannianthus dichotomus*) along the waterfront.
Source: Author.

Literature review

This study is grounded in the concept of cultural landscapes, which emphasises the dynamic interaction between human activities, cultural practices and the natural environment. Cultural landscapes are understood as the result of long-term relationships between people and place, reflecting both tangible and intangible heritage values (Sauer 1925; UNESCO 2012). In parallel, the socio-ecological systems framework highlights the interdependence between human livelihoods and ecological resources, where environmental change and human activities continuously shape one another (Berkes and Folke 1998; Folke 2006). This perspective is closely aligned with the concept of the hydrosocial cycle, which frames environmental systems as co-produced through social, political and ecological processes (Linton and Budds 2014). Recent studies further demonstrate how ritual practices and spiritual beliefs are embedded within riverine cultural landscapes, shaping social organisation and resource use in waterfront communities (Yodsurang et al. 2025). These frameworks inform current debates on cultural heritage and environmental change, highlighting how practices adapt to shifting landscapes. They frame Shitalpati weaving as a coupled socio-ecological system linking community knowledge, resource availability and landscape transformation.

Shitalpati weaving, or the process of crafting intricately woven cooling mats from the murta plant, a perennial wetland shrub that thrives in waterlogged environments, is a traditional handicraft of Bangladesh. The craft is not merely utilitarian but also carries profound cultural and symbolic meaning, particularly in the Sylhet region, where it has been transmitted across generations within artisan families (Barman 2020; Sawrov 2022). The artisans, known locally as *patikars*, possess highly specialised knowledge and techniques that reflect both ecological adaptation and aesthetic refinement. These mats are often used in



Figure 2
The production process of Shitalpati begins.
1. The murta tree is the main raw material for making mats.
2. The trunk is cut lengthwise into four sections, and then divided into two parts, the triangular core and the outer bark.
3. The outer bark is divided into three parts.
4. The murta tree after drying in the sun
5. Starting to weave a mat
Source: Author.

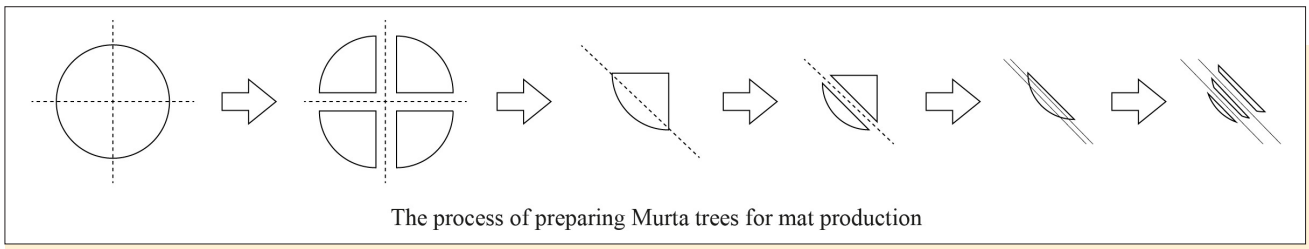


Figure 3
Preparing murta plants for mat production.
Source: Adapted from Ahmed et al. (2014).

domestic and ceremonial contexts, symbolising cultural identity, social continuity and excellent craftsmanship. Recognising its cultural and ecological significance, UNESCO inscribed the Shitalpati weaving of Sylhet on the Representative List of the Intangible Cultural Heritage of Humanity in 2017, affirming its importance as a living heritage rooted in the traditional knowledge systems of rural Bangladesh (UNESCO 2017a).

The production process of Shitalpati begins with cultivating the murta plant in low-lying, waterlogged areas. Once matured, artisans harvest the long, smooth stems (number 1 in Figure 2). The trunk is then cut lengthwise into four sections (number 2 in Figure 2), which are then split into two parts: the triangular core and the outer bark. The outer bark is further divided into three finer layers (number 3 in Figure 2), then boiled with rice water, sun-dried, and split into thin strips called '*pati bet*' (number 4 in Figure 2). These strips are dyed and handwoven into mats with intricate patterns and motifs (number 5 in Figure 2). The outer bark layers, especially the *pet* or *pith* (Bengali language), are preferred for high-quality mats, as shown in Figure 4, while the inner layers and shorter stems are used for more basic products. This traditional process is usually carried out within artisan families, with knowledge passed down through generations. The murta plant also plays an ecological role by preventing soil erosion and flourishing in marginal lands, making it both a cultural and an environmental asset (Ahmed et al. 2014; Rahman et al. 2023).

Based on the 2023 survey, there are 7916 Shitalpati weaving households across 61 communities distributed across eight divisions of Bangladesh. The Dhaka division hosts the largest proportion, accounting for 39.1% of the total weaver families, with 3095 artisans concentrated in ten subdistricts. This is followed by Chattogram, with 20.3%, where 1610 artisans are located in 14 subdistricts, and Barishal, with 15.7%, comprising 1240 artisans in six subdistricts. The remaining 24.9% are distributed among Sylhet (10.7%, 846 artisans in 18 subdistricts), Rajshahi (5.9%, 470 artisans in four subdistricts), Mymensingh



Figure 4
Shitalpati mat products.
Source: Author.

Table 1
Number of craftsman families in Bangladesh.

No.	District	Division	Number of craftsman family	Number of communities with shitalpati weaving	Total	Percentage (%)
1	Jhalokathi	Barishal	570	6	1,240	15.7
2	Barishal	Barishal	495			
3	Pirojpur	Barishal	175			
4	Noakhali	Chattogram	650	14	1,610	20.3
5	Chandpur	Chattogram	410			
6	Feni	Chattogram	180			
7	Lakshmipur	Chattogram	180			
8	Cumilla	Chattogram	140			
9	Chattogram	Chattogram	50			
10	Tangail	Dhaka	2985	10	3,095	39.1
11	Munshiganj	Dhaka	60			
12	Faridpur	Dhaka	30			
13	Narsingdi	Dhaka	20			
14	Jashore	Khulna	25	1	25	0.3
15	Netrokona	Mymensingh	230	6	450	5.7
16	Mymensingh	Mymensingh	220			
17	Sirajganj	Rajshahi	370	4	470	5.9
18	Pabna	Rajshahi	100			
19	Nilphamari	Rangpur	150	2	180	2.3
20	Kurigram	Rangpur	30			
21	Sylhet	Sylhet	215	18	846	10.7
22	Moulvibazar	Sylhet	120			
23	Habiganj	Sylhet	80			
24	Sunamganj	Sylhet	431			
Total				61	7916	100

Source: Data from Rahman et al. (2023).

(5.7%, 450 artisans in two subdistricts), Rangpur (2.3%, 180 artisans in two subdistricts) and Khulna, which has the smallest share with only 25 artisans (0.3%) in a single subdistrict. The overall spatial pattern shows that Shitalpati weaving communities are dispersed throughout the country. However, a higher concentration is observed in the western and northern zones of Dhaka, indicating a regional clustering of craftsmanship that may correspond to historical, ecological or economic conditions favourable to mat weaving.

The spatial distribution of Shitalpati weaving communities across divisions shows distinct patterns based on the number of active artisan communities. These

can be classified into three distribution types. The first is a widely dispersed pattern, as observed in Sylhet, where 18 communities are spread across the outer edges of the division, reflecting a decentralised form of settlement and production. The second type is a clustered distribution, where communities are concentrated in specific zones. In Chattogram, for example, 14 communities are located mainly in the northwestern part of the division, adjacent to Dhaka. A similar pattern is found in Barishal, where all six weaving communities are situated in the northern region, again bordering Dhaka. The Dhaka division itself shows dense clustering in the northern part, with around ten weaving communities within close proximity. This concentration aligns with neighbouring divisions such as Rajshahi and Mymensingh, where communities are grouped near their southern borders, adjacent to Dhaka. The third type includes divisions with very few weaving communities, where no clear pattern of clustering or dispersion can be observed. Rangpur, with only two communities, and Khulna, with just one, exemplify this minimal presence. These variations in spatial arrangement suggest that regional proximity to central Dhaka and the historical presence of murta cultivation may influence both the number and distribution of Shitalpati artisan communities.

Historically, murta plants have been cultivated across various districts in Bangladesh, including Sylhet, Sunamganj, Moulvibazar, Habiganj, Chattogram, Noakhali, Feni, Lakshmipur, Chandpur, Cumilla, Brahmanbaria, Barishal, Jhalokati, Pirojpur, Jashore, Munshiganj, Narsingdi, Tangail, Mymensingh, Natore and Sirajganj (Figure 6). These areas, characterised by low-lying and wetland conditions, provide a favourable environment for murta growth. According to the Bangladesh Forest Inventory, murta cultivation generates a total income of BDT 619.44 million per year, with rural village zones contributing the highest share at BDT 520.78 million annually, which accounts for more than three-quarters of the national total. On average, households in these areas earn BDT 19.36 per year from murta-based activities (Government of Bangladesh 2019). However, murta also plays an important environmental role by helping to prevent soil erosion and by thriving in moist or coastal areas with poor-quality soil. It is commonly found on marginal land, near workers' houses, along canals, ponds and beels, which are consistently moist or waterlogged areas (Ahmed et al. 2014). Although the environment supports its widespread growth, the quality of murta may not be as high as in the past. Additionally, the core of the murta plant can be used as firewood in some areas, where villagers burn it for household fuel. However, it is not as widely used as other types of firewood because it does not burn efficiently (Flora of Bangladesh 2019).

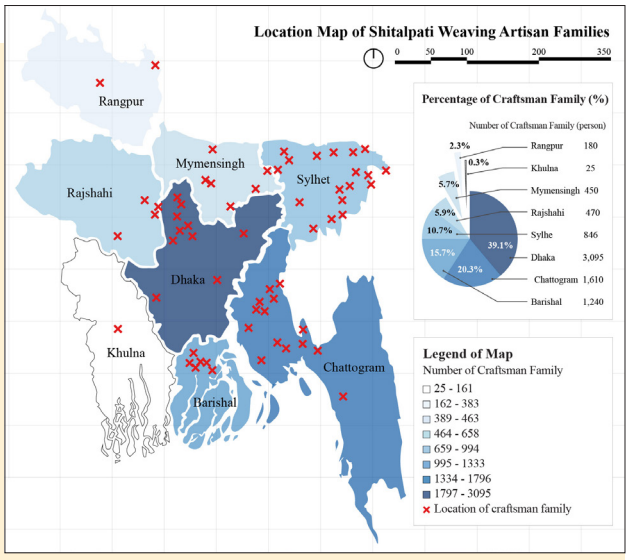


Figure 5
Location map of Shitalpati weaving artisan families.
Source: Data from Rahman et al. (2023).

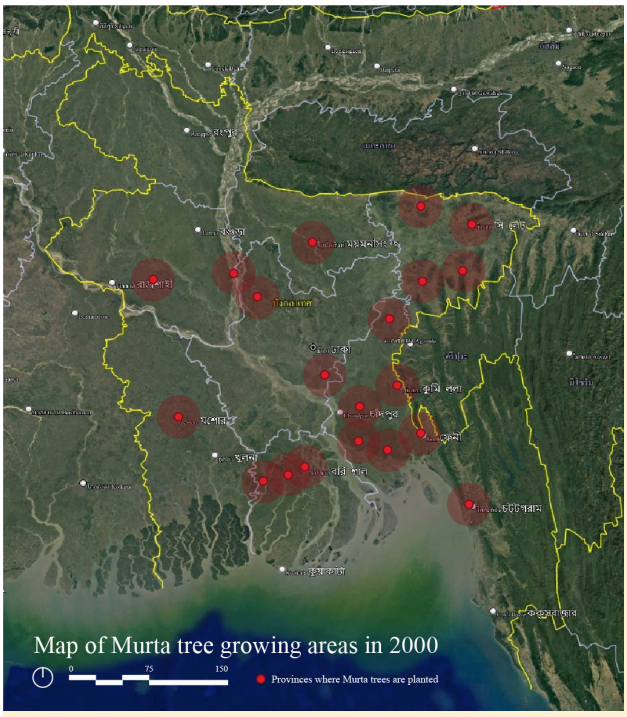


Figure 6
Map showing the location of murta crop plantings in 2000.
Source: The map is based on Google Earth (2024) and data from Rahman et al. (2023).

As the appropriate type of land is shrinking and younger generations are seeking professions that provide a better livelihood, the cultivation of this plant has decreased. Recognising both its ecological importance and the cultural heritage of Shitalpati weaving, the government has initiated institutional efforts to protect and expand its cultivation. In the Ratargul swamp forest in Sylhet, designated murta *mahals* cover 40.5 hectares, with an additional murta garden spanning 25 square kilometres. In 2018–2019, a new garden was also established on 25 hectares by the Sylhet Forest Department. Furthermore, the Bangladesh Forest Department included murta in its long-term plantation plan (2017–2036), aiming to cultivate it alongside bamboo and cane over 7171 hectares to promote sustainable resource use (Bangladesh Forest Department 2020). UNESCO, through 12.COM 11.B.4 of the Intergovernmental Committee, noted that the Ministry of Lands allows communities to cultivate murta crops on government land without paying taxes or rent, and is considering a long-term proposal to allocate government land to Shitalpati weavers (UNESCO 2017b).

Methodology

This study employs a mixed-methods approach to examine the spatial relationship between Shitalpati craftsmanship communities and land use and land cover patterns in Bangladesh, focusing on historical murta cultivation areas. The research design integrates spatial analysis, interviews, field investigation and statistical evaluation, following established methods in heritage landscape research. This approach allows for a comprehensive understanding of how ecological conditions and socio-spatial factors interact to shape the persistence of traditional craft practices.

Geo-spatial data on 61 weaving communities, compiled from a 2023 national survey (Rahman et al. 2023), were digitised and geo-referenced using Google Earth imagery and LULC datasets from the Bangladesh Forest Department (2020). Land cover classes relevant to murta ecology such as swamp forests, herb-dominated wetlands, croplands and rural settlements were extracted for spatial comparison and overlay analysis. Fieldwork was conducted in November 2024 in selected weaving clusters, including Khulna District. Group interviews were conducted with a total of seven participants, including artisans and local leaders, who collaboratively shared perspectives on land use changes, raw material access, production processes and adaptation strategies. Prior to the interviews, verbal informed consent was obtained from all participants, ensuring their voluntary participation and confidentiality. Participants were purposively selected based on their active roles in Shitalpati production and a minimum of five years of experience in the craft. These interviews also captured community perspectives and responses to changing environmental and economic conditions, highlighting the active role of artisans in sustaining the craft.

The qualitative data were transcribed and analysed using thematic analysis to identify key patterns related to resource access, land use change and adaptation strategies (Polin and Alam 2020). Codes were first generated from the interview transcripts and then grouped into broader themes reflecting participants' experiences and perspectives. These insights were triangulated with spatial data to contextualise shifts in resource dependency. The qualitative findings were used to interpret spatial patterns and to explain how community practices respond to environmental change. This combination of spatial and qualitative methods follows recent studies that integrate GIS-based mapping with field-based insights to examine how community practices reorganise under changing environmental conditions (Yodsurang et al. 2024).

Statistical correlation analysis was employed to examine the degree of association between the spatial distribution of Shitalpati weaving communities and specific land cover types identified through LULC classification. Using Pearson's correlation coefficient (r), the analysis quantified the strength and direction of relationships between the presence of artisan clusters and surrounding ecological features such as swamp forests, wetlands, croplands and built-up areas (Obateru et al. 2024). These values helped to identify both positive and negative spatial associations, revealing whether certain land types support or displace traditional craft activities. The resulting correlations were then visualised using thematic maps and heatmaps, allowing for spatial interpretation of patterns and concentrations. This analytical process enabled the identification of ecological zones that remain favourable for murta-based weaving and those increasingly influenced by land use change. By integrating quantitative spatial data with qualitative insights from artisan communities, the study provides a multi-scalar perspective on how ecological and socio-economic transformations are reshaping the traditional craft landscape.

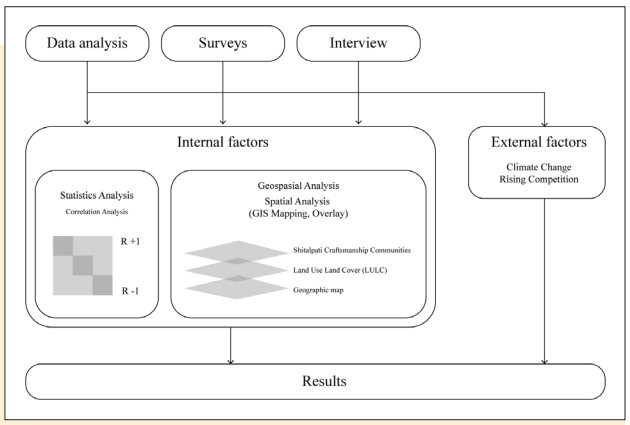


Figure 7
Research framework.
Source: Author.

Results

This study reveals the relationship between the historical spatial distribution of Shitalpati weaving communities and LULC patterns across Bangladesh. Based on GIS mapping and statistical analysis, the concentration of weaving communities is highest in districts where murta cultivation is historically rooted, especially in Tangail, Noakhali, Jhalokathi and Sylhet. These areas possess ecological conditions suitable for growing murta, such as low-lying wetlands, canal banks and perennial waterlogged lands.

According to Table 1, in 2023, Dhaka division led with over 39% of the country's Shitalpati craftsman families, primarily centred in Tangail with 2985 families. This was followed by Chattogram division (20.34%), where Noakhali, Chandpur and Feni districts together formed a dense cluster of Shitalpati artisans. Barishal division – in particular, Jhalokathi and Barishal districts – also represented a significant portion (15.66%). In contrast, divisions such as Khulna and Rangpur showed minimal activity, reflecting both environmental and socio-economic limitations. When overlaying the spatial distribution of current weaving communities with historic murta cultivation zones (marked by green circles on the map), a clear spatial overlap is visible. The red crosses representing present-day Shitalpati communities are

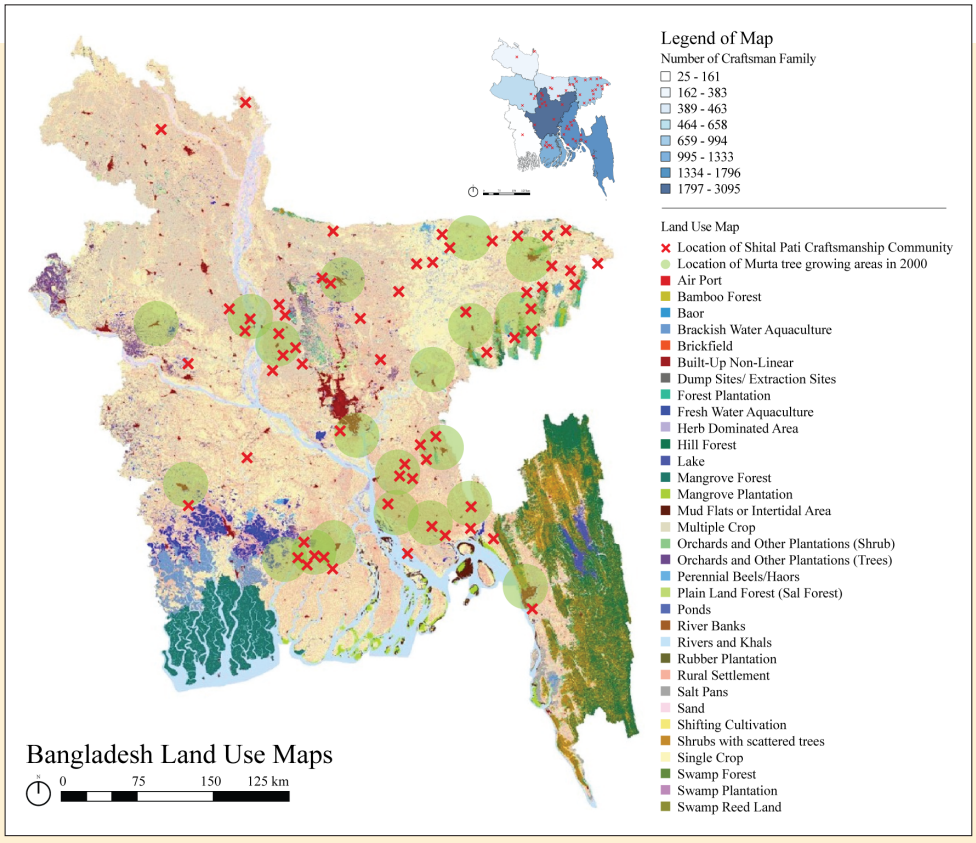


Figure 8
Bangladesh land use maps and location of Shitalpati craftsmanship community.
Source: Data from the Bangladesh Forest Department (2020).

clustered around these traditional cultivation areas, confirming the continuity of ecological dependency. For instance, Chattogram shows cultivation in six zones, particularly dense in the northwest. Sylhet has five known zones, and Dhaka and Barishal each have three, often located close together. On the other hand, the city has undergone significant development, and land use characteristics have changed over time. The results of the correlation analysis between current land characteristics and the mat-weaving communities can be categorised into five distinct landscape groups as follows (Figure 9).

Group 1 is inland wetlands and swamp ecosystems. This group shows very strong correlations ($r > 0.80$) among swamp forest, swamp plantation and swamp reed land areas, indicating they commonly occur together in wetland zones. These areas are also strongly related ($r = 0.6–0.79$) to dump sites/extraction sites. Additionally, single-crop areas show strong correlations with herb-dominated areas (terrestrial) and perennial beels/haors, suggesting interaction between agricultural zones and natural wetland ecosystems. Group 2 is coastal and aquaculture zones. The mangrove forest area shows a very strong correlation ($r > 0.80$) with both the brackish water aquaculture and freshwater aquaculture areas. These two aquaculture zones also have a strong correlation with each other ($r = 0.6–0.79$). Additionally, mudflats and intertidal areas are highly correlated ($r > 0.80$) with mangrove plantation areas, and both are strongly associated ($r = 0.6–0.79$) with rivers and khalis, reflecting the interconnected nature of coastal ecological systems. Group 3 is upland forests and shifting cultivation. This group features very strong correlations ($r > 0.80$) among the areas of shifting cultivation, hill forest and shrubs with scattered trees. The hill forest area also shows a strong link ($r = 0.6–0.79$) with lake areas, representing elevated forest and water catchment zones. Group 4 is agroforestry and plantation zones. The bamboo forest and orchards and other plantations (shrub) areas show a very strong correlation ($r > 0.80$), as do the rubber plantation and forest plantation areas. All four land types are interconnected ($r = 0.6–0.79$), highlighting mixed-use agricultural and plantation landscapes. Group 5 is urban

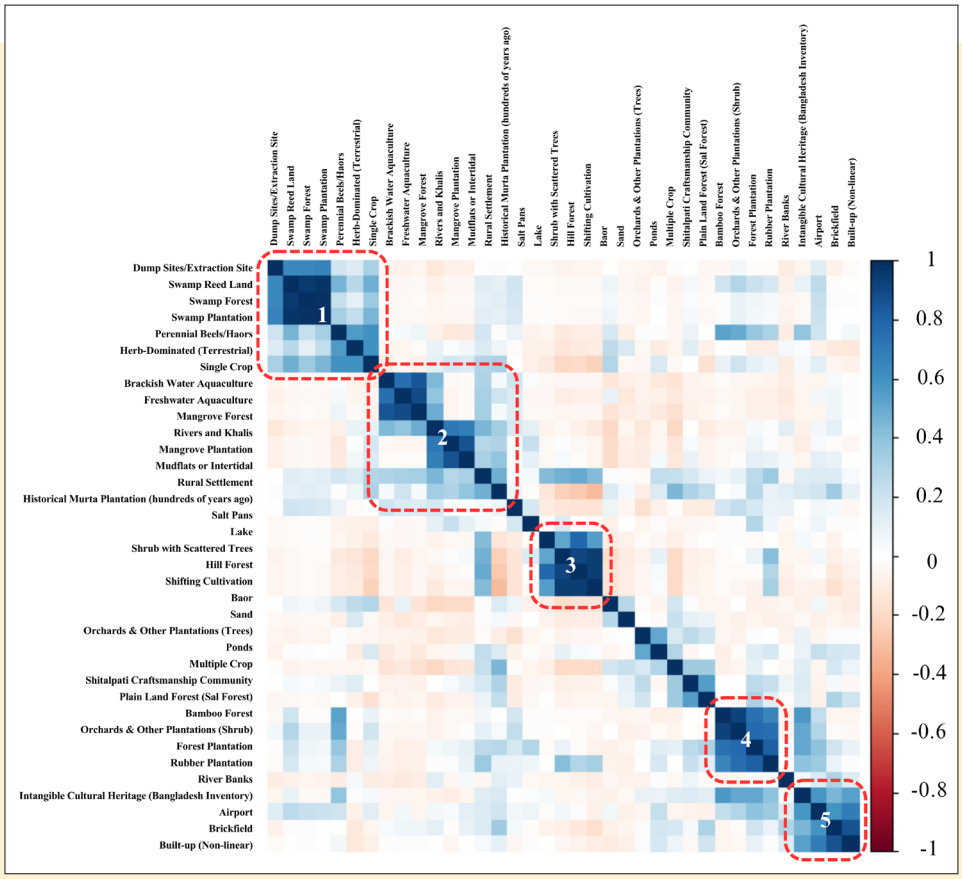


Figure 9
Correlation analysis of Bangladesh land use maps and location of Shitalpati craftsmanship communities.

and industrial zones. The built-up non-linear area is very strongly correlated ($r > 0.80$) with the brickfield area, and the built-up non-linear area is strongly correlated ($r = 0.6–0.79$) with the airport area, reflecting concentrated urban and industrial development.

The correlation analysis indicates that the Shitalpati craftsmanship community does not exhibit a strong association with any current land use or land cover type, suggesting that contemporary mat production is no longer directly linked to murta cultivation areas (Table 2). A

Table 2
Correlation of Shitalpati craftsmanship community distribution with ecological land use groups in Bangladesh (cut-off $r \rightarrow 0.60$)

Group 1		
Factors 1	Factors 2	R-values
Swamp Forest	Swamp Plantation Area	0.988
Swamp Forest	Swamp Reed Land Area	0.957
Swamp Reed Land Area	Swamp Plantation Area	0.974
Dump Sites/Extraction Site Area	Swamp Plantation Area	0.661
Swamp Forest	Dump Sites/Extraction Site Area	0.647
Swamp Reed Land Area	Dump Sites/Extraction Site Area	0.641
Single Crop Area	Herb Dominated Area (Terrestrial) Area	0.609
Single Crop Area	Perennial Beels/Haors Area	0.606

Group 2		
Factors 1	Factors 2	R-values
Mangrove Forest Area	Brackish Water Aquaculture Area	0.856
Mangrove Forest Area	Fresh Water Aquaculture Area	0.891
Mud Flats or Intertidal Area	Mangrove Plantation Area	0.867
Fresh Water Aquaculture Area	Brackish Water Aquaculture Area	0.753
Rivers and Khalis Area	Mangrove Plantation Area	0.711
Rivers and Khalis Area	Mud Flats or Intertidal Area	0.683

Group 3		
Factors 1	Factors 2	R-values
Hill Forest Area	Shifting Cultivation Area (ha)	0.943
Hill Forest Area	Shrub with scattered trees Area	0.940
Shrub with scattered trees Area	Shifting Cultivation Area	0.940
Lake Area	Hill Forest Area	0.784

Group 4		
Factors 1	Factors 2	R-values
Orchards & Other Plantations (Shrub) Area	Bamboo Forest Area	0.920
Rubber Plantation Area	Forest Plantation Area	0.814
Orchards & Other Plantations (Shrub) Area	Forest Plantation Area	0.774
Rubber Plantation Area	Orchards & Other Plantations (Shrub) Area	0.753
Rubber Plantation Area	Bamboo Forest Area	0.653

Group 5		
Factors 1	Factors 2	R-values
Built-up Non-Linear Area	Brickfield Area	0.864
Built-up Non-Linear Area	Airport Area	0.695

moderate correlation is observed with the plain land forest (Sal Forest) area (r = 0.56), while weaker correlations (r = 0.20–0.39) are found with the forest plantation, multiple crop, orchards and other plantations (trees) areas, and the rubber plantation and rural settlement areas. These patterns suggest that traditional communities may have gradually converted former wetlands into agricultural or settlement zones. Notably, the historical murta plantation areas show strong correlations with natural wetland ecosystems such as swamp forest, swamp reed land and perennial beels/haors, which historically provided ideal conditions for cultivating murta, the primary raw material for Shitalpati weaving. Although the correlation between these historical murta areas and current Shitalpati communities remains moderate ($r \approx 0.4$–0.5), recent environmental changes and land use conversions have disrupted this traditional relationship, making local murta sourcing increasingly difficult and weakening the ecological link in many regions.

In analysing Shitalpati production zones, there is a moderate positive correlation with herb-dominated areas, rural settlements and swamp plantation areas. These environments maintain conditions suitable for processing or sourcing materials, even if murta cultivation is no longer locally present. Conversely, Shitalpati shows negative correlations with built-up non-linear and rubber plantation areas, indicating that urban development and monoculture plantations are incompatible with traditional weaving practices. This spatial pattern reflects increasing pressure from land transformation, which may isolate production zones and increase dependence on external raw materials.

The current distribution of the Shitalpati artisan community is associated with plain land forest, rural settlement and multi-crop agricultural areas, rather than with the natural habitats of the murta plant, reflecting a broader shift in which the traditional craft has become embedded within the general agricultural landscape (Figure 10). This weakening relationship with murta cultivation aligns with findings from field interviews, which revealed that artisans no longer grow murta locally but instead rely on purchasing raw materials from other regions. For example, one artisan noted: 'We used to grow murta near our homes, but now the land has been converted into farmland, so we have to buy it from other districts.' Another participant explained: 'The cost of raw materials has increased, and sometimes the quality is not as good as before.' Artisans also raised concerns about land use changes and external pressures, such as competition from plastic mats. These insights from interviews support the spatial analysis, demonstrating that ecological changes affect production practices and costs. This disconnection not only impacts resource access but also threatens the continuity of intangible cultural heritage, including traditional knowledge and skills.

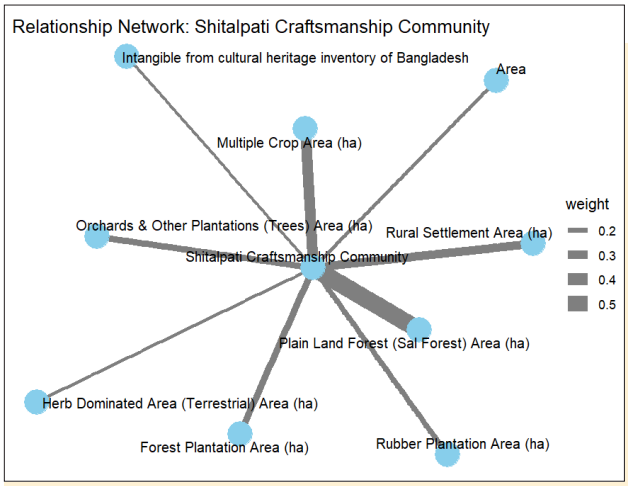


Figure 10
Relation network of Shitalpati craftsmanship community.
Source: Author.

Discussion

The results of this study reveal that Shitalpati weaving maintains a moderate relationship with the ecological and cultural landscape of Bangladesh. Spatial analysis clearly shows that historical murta cultivation areas are associated with Shitalpati communities, typically found in wetland ecosystems, especially peat swamps, reed beds, and haor basins, which provide ideal conditions for murta growth. This reflects broader patterns where cultural practices are shaped by seasonal ecological systems and resource availability (Yodsurang 2026). However, in the present day, the connection between resource bases and production areas has changed. This shift reflects a transition from a resource-dependent spatial system to a market- and settlement-oriented production system. Historically, Shitalpati weaving clustered in proximity to murta-rich wetland ecosystems, where raw materials were directly accessible. However, current spatial patterns show that production is more closely associated with rural settlements and agricultural zones rather than ecological habitats.

This finding indicates that accessibility, infrastructure and market integration now play a stronger role than environmental proximity in shaping the location of craft activities. As a result, the craft system becomes increasingly decoupled from its ecological base, transforming from an embedded socio-ecological practice into a distributed production network dependent on external resource flows. This spatial disconnection is also reflected in local experiences. As one artisan stated, 'Even though we no longer cultivate murta, we still weave mats as a supplementary occupation.' This reflects the adaptive capacity of artisan communities and indicates a shift from resource-based production to culturally maintained practices. This pattern is consistent with broader transformations in river-based communities, where traditional livelihoods adapt to land use change and urban pressure, often leading to ecological disconnection and weakening cultural continuity (Wattanamano et al. 2024).

While historical murta zones remain relevant, the linkage between these areas and Shitalpati craft communities has weakened, indicating a growing spatial separation between raw material sources and production sites. The expansion of rural settlements and monoculture farming in former murta regions has degraded natural habitats, consistent with research from 2010 in northeastern Bangladesh, which reported that small-scale Shitalpati mat enterprises based in murta-growing regions were under serious threat due to severe raw material shortages. The sustainability of these enterprises depended on the continuous and reliable supply of quality raw materials. As a result, the output of many enterprises declined and, in extreme cases, artisans ceased production altogether (Ahmed et al. 2014). This decline in raw materials aligns with policy efforts to expand murta cultivation, as outlined in the 2017 Decision of the Intergovernmental Committee: 12.COM 11.B.4. Clause R3 of the decision permits communities to grow murta on government land without paying taxes or rent. It also proposes a long-term solution by considering the allocation of government land specifically for Shitalpati weavers (UNESCO 2017b). Additionally, a decline in the number of Shitalpati-producing households was reported by *The Business Standard* in December 2021. The report highlighted that in Sylhet, an area known for Shitalpati craftsmanship over the past 30 years, the number of weaving families had dropped by more than half. This decline also corresponded with a significant drop in economic income, caused by external factors such as the rise of plastic mat alternatives and the impacts of the COVID-19 pandemic (The Business Standard 2021). This transformation not only affects the material base of production but also disrupts knowledge transmission and skill continuity across generations. Younger generations are less likely to engage in weaving due to reduced economic returns and changing livelihood preferences. This situation highlights the importance of community-based safeguarding approaches, where local knowledge and collective practices play a central role in sustaining intangible cultural heritage under changing socio-ecological conditions and increasing climate-related pressures.

Furthermore, the relationship between Shitalpati production and land use highlights the craft's transition into an increasingly human-modified landscape. While this shift reflects adaptability, it also indicates a growing dependence on external inputs for survival. Urbanisation, infrastructure development, and market pressure from synthetic alternatives such as plastic mats have further intensified these challenges. Without targeted intervention, the economic viability of Shitalpati weaving may decline to the point where younger generations no longer view it as a sustainable livelihood. These findings have important implications for heritage safeguarding and policy. The increasing spatial disconnection between Shitalpati production and murta cultivation highlights the need for integrated approaches that link cultural heritage preservation with environmental and land use planning. Policy interventions should prioritise the restoration and protection of murta-friendly wetland ecosystems, while also promoting community-based cultivation initiatives to reduce dependency on external raw materials. In addition, safeguarding strategies should incorporate the voices and practices of local artisans, ensuring that traditional knowledge is sustained through participatory and intergenerational approaches. Economic mechanisms, such as subsidies, training programs and market incentives for eco-cultural products, are also essential to enhance the viability of Shitalpati weaving. These strategies emphasise the role of communities as active agents in safeguarding intangible cultural heritage. They align with ICH safeguarding principles, emphasising knowledge transmission, community participation and the continuity of cultural practices.

REFERENCES

- Ahmed, R., A. N. M. F. Islam, M. Rahman and M. A. Halim. 2014. 'Management and economic value of *Schumannianthus dichotomus* in rural homesteads in the Sylhet region of Bangladesh'. *Indian Journal of Natural Products and Resources* 5, no. 4: 365–370. https://nopr.niscpr.res.in/bitstream/123456789/30553/1/IJNPR%205%284%29%20365-370.pdf.
- Bangladesh Forest Department. 2020. *Land cover atlas of Bangladesh: Bangladesh Forest Inventory (Version 2).* https://bfis.bforest.gov.bd/library/wp-content/uploads/2020/06/Atlas_land-cover_v2_17_feb_2020.pdf.
- Bangladesh Forest Research Institute. 1993. *How to cultivate cane and patipata (Bulletin 6: Minor forest resource series).*
- Barman, P. 2020. *Problem and prospect of Shital Pati: a livelihood support handicraft of Cooch Behar district of West Bengal* (Master's thesis, Uttar Banga Krishi Viswavidyalaya). Krishikosh Repository. https://krishikosh.egranth.ac.in/handle/1/5810155016.
- Berkes, F., and C. Folke. 1998. *Linking social and ecological systems: management practices and social mechanisms for building resilience.* Cambridge University Press.
- Daily Sun. 2020 (24 January). *Shitol Pati: a heritage on the verge of extinction.* https://www.daily-sun.com/post/460062/Shitol-Pati:-A-Heritage-On-The-Verge-Of-Extinction-.
- Daily Sun. 2021 (26 June). *Traditional Shital Pati on the verge of extinction.* https://www.daily-sun.com/printversion/details/563894.
- Flora of Bangladesh. 2019 (April). *Shitolpati or murta (Schumannianthus dichotomus).* https://www.floraofbangladesh.com/2019/04/shitolpati-or-murba-schumannianthus.html.
- Folke, C. 2006. 'Resilience: the emergence of a perspective for social-ecological systems analyses'. *Global Environmental Change* 16, no. 3: 253–267. https://doi.org/10.1016/j.gloenvcha.2006.04.002.
- Google Earth. 2024. *Satellite imagery of Bangladesh* [Map]. https://earth.google.com/.
- Government of Bangladesh. 2019. Tree and forest resources of Bangladesh: Report on the Bangladesh Forest Inventory. Forest Department, Ministry of Environment, Forest and Climate Change, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh. https://bfis.bforest.gov.bd/bfi/wp-content/uploads/2020/08/BFI_report_final_8-12-20_2.pdf.
- Karim, M. 2020. *Cyber law in Bangladesh.* Kluwer Law International.
- Kennedy, T. 2010. 'Safeguarding traditional craftsmanship: a project demonstrating the revitalisation of intangible heritage in Murad Khane, Kabul'. *International Journal of Intangible Heritage* 10: 74–85.
- Kiatthanawat, A., P. Yodsurang and A. Krasae-In. 2024. 'Exploring Thai vernacular houses for heritage tourism along the western Bangkok canals'. *Nakhara: Journal of Environmental Design and Planning* 23, no. 1: 407.
- Labrador, A. M. 2022. 'Integrating ICH and education: a review of converging theories and methods'. *International Journal of Intangible Heritage* 17: 17–38.
- Linton, J., and J. Budds. 2014. 'The hydrosocial cycle: defining and mobilizing a relational-dialectical approach to water'. *Geoforum* 57: 170–180. https://doi.org/10.1016/j.geoforum.2013.10.008.
- Obateru, R. O., A. A. Okhimamhe, O. A. Fashae, E. Aweda, D. Dragovich and C. Conrad. 2024. 'Community-based assessment of the dynamics of urban landscape characteristics and ecosystem services in the rainforest and guinea savanna ecoregions of Nigeria'. *Journal of Environmental Management* 360: 121191. https://doi.org/10.1016/j.jenvman.2024.121191.
- Polin, F., and D. Alam. 2020. 'Enhancing community participation in forest management: case study of the Sundarbans, Bangladesh' [Conference paper].
- Rahman, M. A., and M. M. Rahman. 2023. 'Present status and constraints to Shitalpati handicrafts and policy options for improvement in Bangladesh'. *Bangladesh Journal of Agricultural Research* 48, no. 1: 19–36.
- Sauer, C. O. 1925. 'The morphology of landscape'. *University of California Publications in Geography* 2, no. 2: 19–54.
- Sawrov, M. M. H. 2022. 'Branding handicrafts products: a study on Bangladesh'. *Economic Insights – Trends and Challenges* 3: 21–29.
- Shabnam, S., H. Ramkissoon and A. Choudhury. 2019. 'The role of ethnic and cultural events in building an authentic destination image'. In *Tourism in Bangladesh: investment and development perspectives*, 70–84. Routledge.
- Soil Resource Development Institute. 2013. *Agricultural land availability in Bangladesh (Monograph 1).* Ministry of Agriculture.
- The Business Standard. 2021 (11 November). *Shitalpati: Sylhet's craft of hundreds of years, old but in crisis.* https://www.tbsnews.net/economy/industry/shitalpati-sylhets-craft-hundreds-years-old-crisis-344803.
- UNESCO. 2012. *Operational guidelines for the implementation of the World Heritage Convention.* UNESCO World Heritage

Centre.
- UNESCO. 2017a. *Traditional art of Shital Pati weaving of Sylhet* (No. 01112). https://ich.unesco.org/en/RL/traditional-art-of-shital-pati-weaving-of-sylhet-01112.
- UNESCO. 2017b. *Decision of the Intergovernmental Committee: 12.COM 11.B.4.* https://ich.unesco.org/en/decisions/12.COM/11.B.4.
- Water Resources Planning Organization. 2004. *National water management plan project: development strategy (WP040).* Ministry of Water Resources.
- Wattanamano, N., P. Yodsurang and T. H. Nacher. 2024. 'From riverine to urban reality: tracing the transformation of riverfront communities: a case study of Koh Kret, Khlong Om Non, and Khlong Chak Phra-Khlong Bangkok Yai'. *NAJUA: History of Architecture and Thai Architecture* 21, no. 2: 301–348.
- Worldometer. 2024. *Bangladesh population (live).* https://www.worldometers.info/world-population/bangladesh-population/.
- Yodsurang, P. 2026. 'Edible waterscapes: cultural food heritage ecosystem and the flood-plain landscape in Thailand'. *International Journal of Food Design*. Advance online publication. https://doi.org/10.1386/ijfd_00087_1.
- Yodsurang, P., S. Insisiengmay, P. Tansukanan, Y. Uekita, W. Daungthima, M. Nakamura, P. Sihalarth and I. Shimizu. 2025. 'Intangible heritage and rituals of spirit purification embedded in the cultural landscape of riverfront communities in Southern Laos'. *International Journal of Intangible Heritage* 20: 82–96. https://www.ijih.org/volumes/article/1206.
- Yodsurang, P., W. Pinijvarasin and U. Suthutvoravut. 2024. 'Post-COVID-19 spatial resilience in community-based tourism: a case study on Ayutthaya'. *Pertanika Journal of Social Sciences and Humanities* 32, no. 2: 409–435.