

IMPACT OF COASTAL EROSION AND LANDSCAPE CHANGES ON PLACE ATTACHMENT AND THE SENSE OF BELONGINGNESS: A CASE STUDY IN OLUVIL, SRI LANKA

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Abstract: Oluvil is a coastal village on the east coast of Sri Lanka with significant resources of fisheries and agricultural lands. The coastal community of Oluvil has a strong socio-cultural and economic attachment to its natural landscape. The community relies heavily on fishing and agriculture for their economic activities, with the vast coastal lands and rich marine resources providing the main source of livelihood. The haphazard development of the fishery and commercial harbour in 2008 resulted in coastal erosion and related landscape changes. This highly impacted the sensitive coastal belt in the region, resulting in many environmental and social issues. This paper investigates the social impact associated with the related negative environmental changes. The research revealed a significant negative impact on income, livelihood, resources and property due to severe coastal erosion. These economic impacts and landscape changes negatively influenced the cultural identity, social dynamics, social structure and interactions, resulting in the loss of place attachment and the sense of belongingness.

Keywords: *Coastal erosion, Landscape changes, social impacts, Place attachment, Sense of belongingness*

1. Impact of coastal landscape changes on the local community

Coastal landscape changes severely impact communities by changing their socio-economic, cultural, and environmental well-being and sense of belonging. Ameer (2015) identified that these changes displace traditional livelihoods such as fishing, agriculture, and tourism, leading to instability despite potential new infrastructure and development project opportunities. Culturally, changes in the coastal environment can destroy traditional and communal practices. The loss of cultural landmarks and changes in land use diminish the community's heritage and identity. Traditional festivals, fishing techniques, and agricultural practices passed down through generations may no longer be functional, weakening cultural continuity, community identity and attachment towards their own landscape.

Landscape changes can disrupt the social fabric of coastal communities. Displacement or changes in population dynamics weaken established social networks and support systems, reducing social cohesion and increasing conflict. The loss of physical spaces for social gatherings further hinders community interaction and solidarity. This affects the social factors of the local community. According to the Audit report of the Auditor General's Department, Sri Lanka, these changes often degrade natural resources and ecosystems, impacting the availability and quality of resources such as clean water, land, fish biodiversity and other agricultural by-products (Auditor General of Sri Lanka, 2015). This results in socio-economic and health issues while increasing vulnerability to natural disasters like flooding and erosion. The socio, cultural, economic, and recreational activities that create more attachment towards their landscape are destroyed due to these changes, which affect the locals' sense of belonging.

2. Introduction to the coastal community in Oluvil

The coastal community in Oluvil depends on the coastal landscape for livelihood and resources. The community engages in traditional practices such as fishing, boat-making, net-weaving, fish processing and craft-making ('Oluvil', 2017). These practices are also integral to Oluvil's heritage, often involving collaborative efforts that strengthen social ties and cultural continuity.

Fishing is more than just an occupation; it is a way of life passed down through generations, with specific fishing locations, techniques, and seasonal patterns deeply rooted in the community's routines and traditions. Local markets where fish and agricultural products are sold are not only economic hubs but also social gathering spots that maintain social bonds and community cohesion. Practices connected to the sea and agricultural cycles, such as the annual fishing season opening and harvest auctions, are important in maintaining cultural identity and fostering a collective sense of belonging. According to Dilsaadh's statement (*Oluvil and impacts on Oluvil*, personal communication, n.d.) the community's social networks are closely tied to the landscape, with families living in proximity, facilitating strong

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FARU Journal: Volume 11 Issue 01 DOI: <https://doi.org/10.4038/faruj.v11i1.310>

connection and a strong support system. This place attachment involves deep emotional bonds with the surroundings, shaping the community's sense of self and identity.

Shared experiences of working on the land and sea, facing environmental challenges, and celebrating cultural practices enhance a strong sense of solidarity and reinforce their sense of belonging. The sea, beaches, and agricultural lands hold symbolic meanings and emotional significance, are seen as providers and protectors, and are integral to the community's collective memory and identity. Knowledge about the landscape and its resources is passed down through generations, ensuring cultural heritage and social cohesion continuity. The community of Oluvil enjoys a harmonious relationship with their landscape, which is central to their socio-cultural and economic life, fostering a strong sense of belonging and resilience, making the landscape an inseparable part of their collective well-being.

3. Impact of coastal erosion and related landscape changes in Oluvil

The Government initiated the first mega port construction project on the eastern coast of Sri Lanka in Oluvil in 1994. The harbour is designed with two sectors: commercial and fishing harbours. The commercial harbour is capable of taking ships up to five thousand metric tons, and the fishing harbour is capable of handling more than 250 fishing boats at a time (Ameer, 2015).

This development plan was implemented with the main objectives of providing a marine transportation network, transporting preliminary goods from the west to the east of the country, and moving the fishery and agricultural products to the commercial city. In addition to these main objectives, some secondary objectives include enhancing internal transport, increasing the interest of cement and fertilizer manufacturing investors, providing services for international ships and developing the port for international users, exporting, providing services for fishing and providing direct and indirect employment for the locals (Zoysa et al., 2023).

The project's construction started in 2008 and was finished in 2013. To mitigate the intense sea erosion due to the harbour construction, a breakwater structure was constructed in 2012, further intensifying the coastal erosion. The annual erosion rate, about 150-200m, increased to 700-800m in some parts of the shoreline. As a result, approximately 35 acres of agricultural land were lost, and 3000 coconut trees were unplugged (Auditor General of Sri Lanka, 2015). The coastal erosion rate increased from 0.1 ha to 0.35 ha per year (Nijamir & Kaleel, 2018). The Kali-Odai River and estuary were the main sources of freshwater fishing and the production of reed (Pan). The changes in the Kali-Odai River and estuary resulted in the decline of these traditional practices and further impacted the natural flood control system of Oluvil.

Table 1: Erosion and accretion in the Oluvil harbour area (Nijamir & Kaleel, 2018)

Year	Accretion(ha)	Erosion(ha)	Total growth erosion	Growth Rate (ha/yr)
1981 – 2001 Before harbour construction	1.25	4.07	2.82	0.14
2001 – 2015 During harbour construction	0.22	5.16	4.94	0.35

The changes in the coastal line and morpho dynamic can be clearly identified in Figure 1. According to the data presented by Nijamir and Kaleel (Nijamir & Kaleel, 2018)

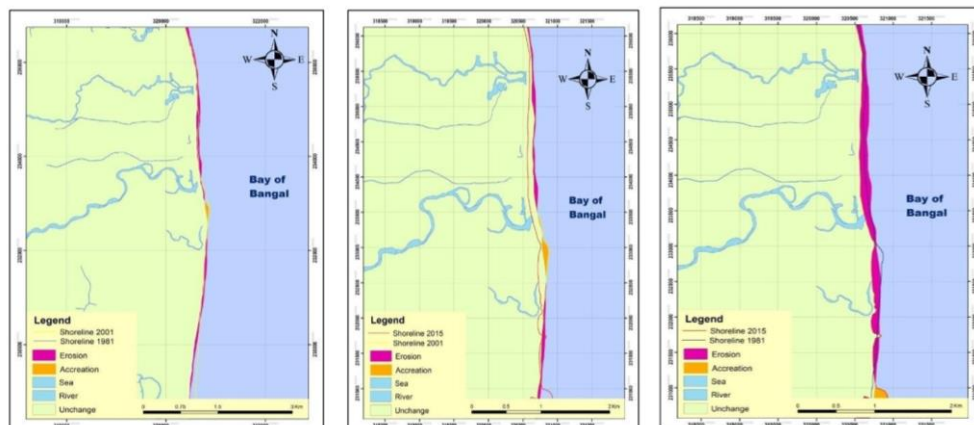


Figure 1: Coastal line change from 1981-2015
(Source Nijamir & Kaleel, 2018)

4. Impact of 'space' on place attachment and sense of belongingness

In environmental psychology, 'space' is transformed into 'place' when endowed with meaning (Low & Altman, 1992; Lewicka, 2008). The place is identified as the immediate environment of one's physical being; moreover, it is connected to a person's arena of action, which may have historical, social and cultural meaning (Casey, 2001). People's connection to place can be defined by several terms; Place attachment, place identity and place dependence are some of the terms identified in the literature (Florek, 2011). Literature on place attachment stresses the importance of psychological balance, positive adjustment, feeling of stability, and involvement in local activities as significant markers that increase emotional bonds with places (Rowles, 1990 & Hay, 1998). Place attachment has been defined as the emotional link people build with a specific place where they live and feel comfortable and safe (Florek, 2011). Place identity or belongingness is a type of bond individuals develop with their surroundings (Florek, 2011). place identity can be defined as the ability to separate oneself from others and to build positive self-esteem (Twigger-Ross & Uzzell, 1996). It can be identified as a process where people describe themselves as belonging to a specific place based on their interactions with the place (Stedman, 2002). This concept can be applied to an individual, group or culture and fosters positive attributes such as self-esteem, self-worth and self-pride (Low & Altman, 1992)

According to environmental psychology, three components affect place attachment: affective (emotional), cognitive and behavioural. (Low & Altman, 1992; Jorgensen, & Stedman, 2001). Affective or emotional place attachment is a socially constructed deep emotional tie to a place. It can be attributed to genealogical linkage, family tradition, and memories of social interactions with friends and family with a place. Functional place attachment is based on behavioural interactions related to activities such as agriculture, recreation, rebuilding and restoration. Function-based place attachment is linked to satisfying a personal need, purpose or goal such as economic, livelihood, raising a family in a particular place. This is related to landscape characteristics which sustain the functional requirement. Cognitive attachment is related to constructed meaning and intellectualized interpretations of a place. It included knowing and understanding the details of the environment. (Baldwin, et al .2017)

This study focuses on functional attachment. The study explores how the negative landscape changes which resulted from the construction of the new commercial and fisheries harbour impacted the community functional attachment to the place. The study firstly explores the physical impact related landscape changes and livelihood of the community and secondly enquired how this affected place attachment and community sense of belongingness.

5. Methodology

A field survey was conducted among residents in Oluvil who were affected by the landscape changes that resulted from the construction of the commercial and fisheries harbour. The survey consisted of three parts: semi-structured interviews, observations, and a questionnaire survey. A semi-structured interview was conducted among professionals knowledgeable on the environmental and social impact of the harbour construction project. Grama Niladhari of Oluvil, Assistant Director (Planning), Addalaichenai Divisional Secretariat; Divisional officer, Addalaichenai Divisional Secretariat, Land acquisition division. These interviews provided insight into the broader issue and helped to develop the questionnaire survey. Observations helped to clarify the environmental impact, social patterns, behaviours and daily activities of community members.

The questionnaire survey was carried out among the residents in Oluvil, and sixty responses were received. Due to time and resource constraints, the convenience sampling method was used to select the sample population for the survey. Observations and questionnaire surveys were used to collect information on four areas of impact identified based on the semi-structured interviews with experts: income and livelihood, resources and property, cultural identity and social dynamics, social structure and interactions. These main areas connect people to their environment and are a significant aspect of identity, place attachment, and sense of belonging. The variables tested under the four impact categories are summarized in Table 2.

Table 2: Areas of impact and tested variables

Impact categories	Variable
Income and livelihood	Impact on livelihood
	Change of occupation
Resources and property	Impact on harvest
	Conflict due to lack of resources
	Accessibility of agriculture and marine life features
	Changes in rights or ownership of properties
Cultural identity and social dynamics	Impact on tradition practices
	Sense of belonging
Social structure and interactions	Changes in the community interaction
	Changes to family dynamics
	Impact on Recreation and leisure
	Types of recreation affected

6. Results and Discussion

The questionnaire survey was conducted within the affected community. Sixty responses were collected from residents of the study area. Table 3 summarizes the demographic information of the sample population.

Table 3: Composition of the sample population

Demographics	Description	Frequency	Valid Percentage
Age	16-30	4	7%
	31-40	24	40%
	41-60	29	48%
	60 above	3	5%
	Total	60	100%
Gender	Male	38	63%
	Female	22	37%
	Total	60	100%
Residency duration	Less than 5 years	1	2%
	5-10 years	7	11%
	From birth	49	82%
	other	3	5%
	Total	60	100%

6.1 IMPACT ON INCOME, LIVELIHOOD, RESOURCES AND PROPERTY

The respondents identified that landscape changes which occurred due to the construction of the commercial and fisheries harbour had a significant negative impact on their livelihood. The community in Oluvil is mainly engaged in deep water fishing, freshwater fishing, coconut agriculture, dry fishing and crafting activities. Respondents identified fishery-related occupations mainly affected by landscape changes (Table 4). As shown in Figure 02, 72% also stated that a change in occupation resulted due to landscape changes. This information is further clarified in the expert interviews, in which a 70% reduction was identified in the fishing industry, mainly attributed to loss and damage to property, lack of resources and safety concerns due to unpredictable shoreline changes resulting from heavy coastal erosion.

Table 4: Impact on Income, livelihood, resources and property

Description	Scale point		Mean	Std Deviation
	1	5		
Impact of landscape change on livelihood	Negative	Positive	2.2	0.82
Accessibility of agriculture and marine life features	Decreased	Increased	1.62	0.64
Effect on fisheries resources	Decreased	Increased	3.05	1.03

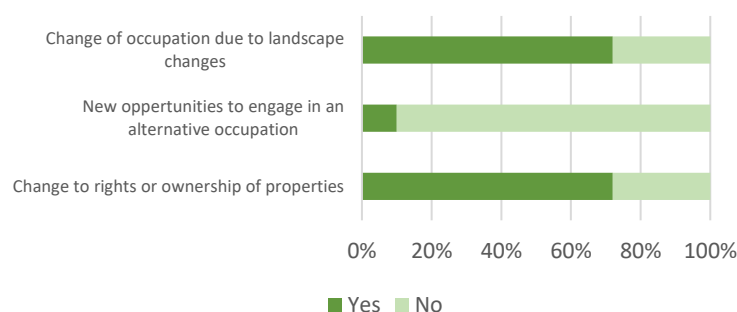


Figure 2: Impact on Income, livelihood, resources and property

6.2 CULTURAL IDENTITY AND SOCIAL DYNAMICS

The main traditional practices that formed the identity of the community in Oluvil consist of deep-sea fishing (34%), freshwater fishing (10%), dry fish making (5%) and pan mat weaving (7%) ('Oluvil', 2017). The questionnaire survey reveals that landscape changes due to harbour construction largely impacted two of the main livelihoods of this community, which is deep sea fishing and freshwater fishing (Figure 3a). The beach was also a significant aspect of their cultural and social identity, and community interactions were deeply attached to the beach as a recreation space. The questionnaire and expert interview results revealed that gathering, playing, observing, fishing for fun and other recreation on the beach were also negatively impacted (Figure 3b).

Changes to familiar landscape elements and restrictions to the daily routine can interfere with the emotional bond people have with the environment. As behaviour constraint theory suggests, when people feel powerless and unable to control stimuli in the environment, they either accept what they cannot change or withdraw from the environment entirely (Diaz, 2022). Such a negative outcome can also be observed within the Oluvil community. The survey reveals that loss of beach, loss of cultivation land and deformation of the Kali-Odai River are significant factors that affected the sense of belongingness (Figure 3c). The reduced connection to nature negatively impacted the sense of belongingness. Adger et al. (2013) identified that environmental changes and the subsequent displacement of communities can disturb social cohesion and cultural continuity, leading to a loss of sense of belonging.

The impact on livelihood, social interaction and recreation has significantly affected the sense of belonging in the community. Amit and Bar-Lev (2015) identified that cultural practices are a significant asset that forms the shared identity within a community, nurturing a sense of belonging and mutual understanding. The cultural practices people engage in through generations and associated activities that connect them increase the sense of belongingness. Social detachment may result from disruption to community interaction due to landscape changes and related loss of livelihood and community interaction.

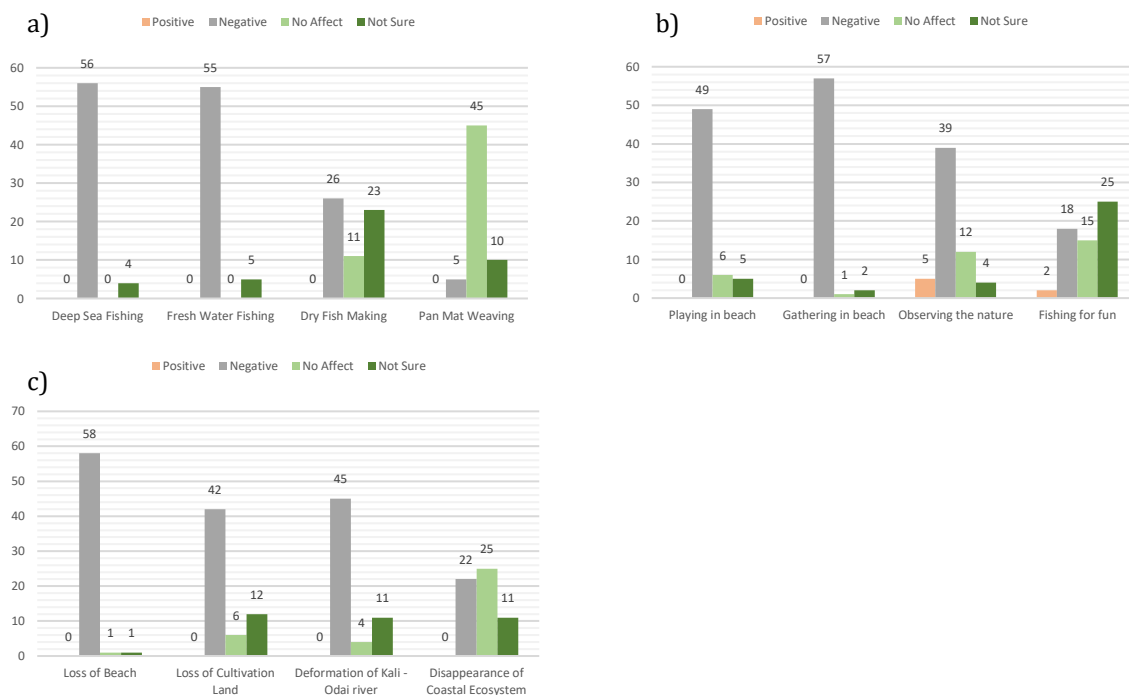


Figure 3: Impact of coastal erosion on a) traditional practices, b) recreation and c) the sense of belongingness

6.3 SOCIAL STRUCTURE AND INTERACTIONS

Social interaction is essential to foster a sense of belonging and interconnectedness in the community. Interactions develop a sense of shared identity and purpose; this is essential for the well-being of the community. Negative landscape changes related to development can disrupt opportunities to raise interaction within the community. Lack of resources and loss of livelihood can significantly impact the social structure. In the case of Oluvil, the reduction in opportunities for traditional livelihoods such as fishing resulted in a significant increase in mothers and wives who left the country as domestic helpers. Changes in family structure have significantly impacted the future generation, given that the family is a fundamental unit within the broader societal structure. Due to a lack of sufficient parental supervision, children may be more prone to engaging in delinquent behaviour and may also experience various psychological challenges. Modifications to the basic social structure can influence how individuals interact within the community and their capacity for decision-making. Even minor alterations in family dynamics ripple through the community, affecting the younger generation profoundly because of the family's role as a societal microcosm.

Table 5: Impact on social structure and interaction

Description	Scale point		Mean	Std Deviation
	1	5		
Change in recreation and leisure	Decreased	Increased	1.75	0.54
Interaction among community members	Decreased	Increased	1.62	0.64
Contribution of women to family income	Decreased	Increased	4.33	0.75

7. Conclusion

In Oluvil, the community is strongly connected to the scenic shoreline, paddy fields, the tranquillity of the Kali-Odai River, and the dynamic coastal ecosystem. These natural features play a crucial role in the residents' recreational and relaxation activities. According to a recent survey, the community feels negatively impacted by changes to these environmental features. Such disruptions create a sense of unfamiliarity among the residents, weakening their sense of belonging to the community. The above insights underscore how landscape changes and alterations in family and social structures can have far-reaching impacts on community cohesion and individual well-being. The loss of land and livelihood has significantly impacted the social aspects of the community in Oluvil. Traditionally, this coastal community relied heavily on fishing, agriculture, and small-scale trade for their economic activities. The construction of the harbour and resulting environmental changes have disrupted these activities, leading to substantial socio-economic challenges.

As fishing grounds were compromised and agricultural productivity declined due to changes in water salinity and land availability, community members were forced to seek alternative employment or jobless situations. This economic instability has had a ripple effect on the social fabric of Oluvil. The economic upheaval has strained social relationships, as the outmigration of individuals seeking employment elsewhere has led to a breakdown in family structures. With more people leaving the community, family bonds and social networks have weakened, leaving the youth particularly vulnerable to negative influences and psychological stress due to the lack of adequate supervision and support.

Physical changes to the landscape, such as the loss of the familiar coastline and paddy fields, have further eroded the sense of belonging and place attachment among residents. Recreational and spiritual activities, which relied on these natural settings, have been adversely affected. Overall, the combined effects of economic displacement, cultural erosion, and weakened social cohesion underscore the profound social impact of landscape changes in Oluvil. Addressing these issues requires a comprehensive approach that integrates economic support, cultural preservation, and community engagement to restore the social vitality and resilience of the community.

8. References

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