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**RESILIENT THREADS OF MANCHAR LAKE:
CRAFT-BASED PARTICIPATORY ART AS A VEHICLE FOR
WOMEN'S EMPOWERMENT AND ENVIRONMENTAL
STORYTELLING IN SINDH, PAKISTAN**



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Abstract

Pakistan's biggest freshwater lake, "Manchar", is facing serious ecological degradation over the past few decades because of industrial pollution, agricultural run-off and alteration in the hydrological regimes of the lake. This has led to a drop in water quality and biodiversity and has had a marked impact on the livelihoods and culture of the indigenous fishing community (Mohana), who are closely tied to the lake. Some of the most affected are Mohana women, whose traditional skills of ralli patchwork, quilting and crochet have been a part of household livelihood and the preservation of the knowledge of the traditions. The paper introduces a conceptual research framework for Resilient Threads of Manchar Lake, a participatory, place-based art installation that involved local craft skills and environmental narratives. Guided by the concepts of participatory design, socially engaged work, eco-art and women empowerment, the project aimed to shift the role of community members from recipients to co-creators. The design utilised reclaimed timber, handmade textiles, and ceramic accents to convey the ecological narrative around Manchar Lake, while also honouring the strength and ability of the artisans in the local community. In contrast to standard empirical results, the study herein offers a research-through-design model to show how collaboration in artistic practice can help to advance women's empowerment, environmental awareness, community engagement and cultural maintenance at the same time. The framework also discusses ethical aspects, community ownership, and sustainability, providing a model that can be implemented in other communities with environmentally critical heritage.

Keywords: Participatory art; Women's empowerment; Environmental storytelling; Manchar Lake; Mohana community; Ralli quilting; Eco-art; Research through design

1. Introduction

Manchar Lake is the largest freshwater lake in Pakistan, located in the province of Sindh, Pakistan. It is the birthplace of one of the oldest indigenous fishing communities of South Asia, the Mohana (Mirani, 2015). The lake served as an ecological resource as well as the basis for a distinctive cultural environment in which fishing, boatbuilding, textile making and oral history all developed in harmony for centuries. Thousands of families directly relied on the biodiversity of the lake, and traditional crafts by the Mohana women were also significant aspects of cultural identity and an additional source of income for their households (Panwar, 2024).

But, during the last 40 years, Manchar Lake was severely degraded. Water quality and fish populations and migratory bird habitats were severely impacted by industrial wastewater, untreated sewage, agricultural runoff and altered river hydrology (Sharif 2025). These ecological shifts had far-reaching social and economic impacts on communities in the lake-dependent areas. Affected by declining fisheries, many Mohana families left behind their traditional ways of life, leading to the gradual loss of indigenous knowledge, cultural practices and craft traditions embedded in the local communities (Moti, 2018).

Included in the cultural practices at risk was the ralli quilting, a centuries-old textile tradition observed by women all over Sindh (Streefkerk, 2006). Ralli quilts were made from various pieces of cloth recycled into complex geometric patterns, embodying both art and eco-friendly craftsmanship. These fabrics also served as vital sources of income, knowledge sharing and social bonds among the household. However, these skills were endangered by economic pressures and shifting markets and by environmental displacement.

Recent scholarship highlighted the need to consider the preservation of the environment and the preservation of culture as two aspects of the same process of development (Dissanayake, 1992). Rather, sustainable measures increasingly acknowledged the importance of building local resilience through engaging and empowering local communities, safeguarding local indigenous knowledge systems, and inclusive

environmental decision-making. One possible means to accomplish these goals, which are interconnected, is through participatory art. In contrast to traditional public art, participatory practice placed community members as active partners who co-created the work as the content and context for the art emerged during the process. (Kester, 2004)

This paper discusses Resilient Threads of Manchar Lake, a conceptual participatory art project aimed at combining environmental storytelling with women's empowerment through craft making. The project aimed to use a site-specific installation and a collage of reclaimed wood, traditional textiles, crochet and ceramics to make indigenous craft practices useful tools for addressing ecological issues and change while increasing women's cultural visibility, voice and agency.

This article takes a research-through-design (RtD) approach to the research process (Zimmerman et al., 2007), rather than an empirical intervention study. The designed installation was the main research artefact to explore the connections among cultural heritage, participatory design, environmental sustainability, and women empowerment. Instead of presenting the results of the field, the study laid out a conceptually driven framework for implementation, evaluation and adaptation in similar ecological and cultural settings.

For this reason, this paper can be said to have three goals:

- To examine how participatory craft-based art supported women's empowerment within indigenous communities.
- To establish an interdisciplinary conceptual framework connecting eco-art, participatory design, and environmental storytelling.
- To propose a transferable model for community-led artistic interventions addressing environmental degradation and cultural resilience.

2. Literature Review

2.1 Ecological Degradation of Manchar Lake and Its Socio-Cultural Impacts

Manchar Lake in the province of Sindh was once one of the most important freshwater ecosystems in Pakistan and an environment for a wide variety of aquatic life and the livelihood of the local Mohana fishing population. Over the last 40 years, however, the lake's environment has suffered due to the breakdown of the ecosystem at a fast pace and turned into one of the nation's most stressed environmental wetlands. The untreated discharge of industrial effluents, agricultural run-off and municipal wastewater into the Main Nara Valley Drain (MNVD) and Right Bank Outfall Drain (RBOD) significantly lowered water quality, salinity and fish numbers (Mirani, 2015). All these ecological changes led to the displacement of communities whose social, economic and cultural lives were tied to the lake, further compounding the displacement of communities. This further pushed communities off the land, as their social, economic and cultural life was a part of the lake.

The degradation of the environment went beyond biodiversity loss, as it was also a direct threat to cultural heritage. Increasing unsustainability of fishing led to the shift of many Mohana families from houseboats to neighbouring settlements, thereby disturbing the long-standing tradition of community life (Moti, 2018). This shift compromised the transmission of the indigenous ecological knowledge, traditional boat-building skills, oral history and women's textile skills. Thus, the conservation efforts that were undertaken in Manchar Lake needed solutions to restore the environment, preserve its culture, and build community resilience—solutions that solved all three problems at once.

2.2 Craft Traditions and Women's Empowerment

Handicrafts used to hold an integral place in Pakistan's rural economy and culture in the past. Of these, ralli quilting was one of the most unique skills of the Sindhi community. Ralli quilts, which feature geometric patchwork incorporating recycled fabrics, were indicative of sustainable production methods as well as embodying local identity, family history and the transfer of knowledge from generation to generation (Streefkerk, 2006). The interdependence of ralli production also had a positive impact on strengthening social relations between the women since it provided opportunities to learn and share cultures together.

Empowerment for women was not limited to earning a livelihood; it also included access to resources, decision-making power, recognition and involvement in the development of communities. Kabeer's (1999) empowerment framework focused on increasing women's capabilities, agency and achievements. In this context craft production was seen as a route to an economically independent and self-sustaining existence and as maintaining cultural identity.

Environmental displacement, on the other hand, did not guarantee empowerment of production by handicrafts (Wilkinson-Weber & Ries, 2016). Artisan communities were frequently limited by structural barriers such as limited access to markets, financial means, bargaining power, and lack of institutional support. Hence, projects which were skill-based were successful in promoting the participation of the people, providing good remuneration, making the products visible in the market and recognising the artisans as knowledge holders and not just cheap human resources. The incorporation of traditional crafts into participatory art allowed for the exploration of these more encompassing aspects of empowerment.

2.3 Participatory Design and Socially Engaged Art

From being a user-centred approach, participatory design moved to a more collaborative practice where community members were engaged in the design process from the start (Sanders & Stappers, 2008). Participatory approaches focused not on designing for communities but, at the same time, on designing with communities, seeing local knowledge as an important source for innovation. Co-creation processes engaged participants in generating ideas, making design decisions and sharing the ownership of the outcomes, which enhanced social relevance and long-term sustainability.

In modern art practice, collective creation, collaboration and dialogue were also high priorities for socially committed art, exceeding the importance of individual art production (Kester, 2004). Unlike art-making for artworks alone, artists helped to create collaborative processes to address social issues and build community participation (Bishop, 2012). These practices were especially useful in marginalised communities, as they helped to raise visibility and foster cultural identity and collective action over shared issues.

There was also a potential ethical consideration which was discussed in critical scholarship. However, participation projects can sometimes end up reinforcing unequal power dynamics when the community is involved on a superficial level or when there is a clear division of creative controls between external practitioners and the community (Cooke & Kothari, 2001). Transparency, co-production, equitable acknowledgement of contributors, informed consent, and effective community ownership of the project were thus essential to participatory practice ethically. Transparency, co-production, equitable acknowledgement of contributors, informed consent, and effective community ownership throughout the project lifecycle were thus necessary for participatory practice from the ethical perspective. The developed installation framework was based on these principles.

2.4 Eco-Art and Environmental Storytelling

Eco-art took shape as an interdisciplinary art that approached the issues of environmental education, ecological restoration and sustainability (Gablik, 1991). Eco-art aimed to create emotional linkages between people and ecosystems, a different approach to environmental communication than traditional environmental communication, with a focus on place-based experiences. Eco-art merged local material, culture, and community engagement to communicate scientific information in a way that was accessible and personally relevant (Lippard, 1997).

Similarly, environmental storytelling acknowledged that stories have a greater effect than technical information on understanding ecological issues (Cronon, 1992). Through storytelling based on local experience, communities were able to share environmental change in their memories, symbols, and traditions and through their daily practices. Environmental storytelling and traditional crafts together made women's experiences integral to environmental advocacy while sustaining cultural heritage at risk due to environmental changes in the case of Manchar Lake.

2.5 Research Gap

Despite the many studies on Manchar Lake's environmental degradation and on the women's handicrafts, community development and participatory design separately, little attention was given to the intersection of these areas in a single, interdisciplinary approach. There is very little research that has investigated the possibility of improving women's empowerment, safeguarding cultural heritage and conveying environmental issues while addressing the necessity of participatory art practice. Moreover, there was limited availability of conceptual models related to research-through-design and eco-art in Pakistan. This study aimed to fill these gaps by suggesting a framework where community co-creation is the bridge between cultural sustainability, environmental storytelling and women empowerment.

3. Methodology

3.1 Research Design

A research-through-design (RtD) methodology was used in this study, which is a well-known method in design research that involves the iterative development of creative artefacts to produce knowledge (Zimmerman et al., 2007). In contrast to an intervention in the field that is completed and evaluated, RtD used the process of designing to offer a way to explore complex social, cultural, and environmental issues by designing and reflecting upon design outcomes. The participatory installation was the main research artefact used in this study for the exploration of the relationships between community participation, empowerment of women, cultural heritage and environmental storytelling.

The project was a learning-by-doing process and a design approach rather than an empirical intervention. In this regard, the study laid the foundations of the theoretical, design, ethical and implementation approach needed for the implementation and evaluation of the installation.

3.2 Theoretical Framework

The framework developed incorporates four complementary theoretical approaches:

1. **Participatory Design Theory:** The theory of participatory design highlights the importance of the community members as the co-creators of the design process, not as recipients of a pre-designed solution but as active participants in the process of creating knowledge (Sanders & Stappers, 2008). Co-creation encouraged community ownership, and community priorities and lived experiences were captured.

2. **Socially Engaged Art:** Offered a perspective on how art can be considered a social dialogue (Kester, 2004). From this point of view, the importance of an artwork was not only in its aesthetic qualities but also in its ability to support participation, foster a sense of community and stimulate public debate on social and environmental issues.

3. **Eco-Art Theory:** Art with theory as a tool for communicating about environments and ecological awareness (Gablik, 1991). Eco-art brought together natural materials, local stories, and place-specific symbolism in ways that fostered emotional connections to environmental issues and that were difficult to create with scientific communication.

4. **Women's Empowerment Theory:** It informed the project's emphasis on women's empowerment in terms of their agency, visibility and recognition within the framework of collaborative craft production (Kabeer, 1999). Traditional textile knowledge was thus not only considered cultural heritage but also a valuable social and economic tool, which could contribute to community resilience.

Combined, these theoretical frameworks were an interdisciplinary approach that connected environmental sustainability, participatory design, indigenous knowledge, and cultural preservation.

3.3 The Community Co-Creation Process Model

The proposed implementation layout was in the following stages as listed in Table 1:

Table 1: Phases of the Community Co-Creation Process

Phase	Title	Core Structural Activities	Target Participants
Phase I	Community Engagement	Building relationships, trust dialogues, informal participatory storytelling and memory collection.	The Mohana community elders, fishermen and artisans.
Phase II	Collaborative Design	Co-creation workshops, choice of materials and motifs, design of the colour palette, and sketching of the layout.	Design facilitators: Mohana women artisans.
Phase III	Collaborative Fabrication	Synthetic hands-on making of textile panels (ralli, crochet), assembly of timber framework and integration of ceramics.	Local artisans – women, woodworkers and potters.
Phase IV	Exhibition & Engagement	Public installation and storytelling circles, educational workshops and policy dialogues on site.	General public, researchers, environmental policymakers.

3.4 Ethical Considerations

Ethical engagement was a key focus of the project design. Voluntary participation and informed consent were put in place. When planning workshops and community meetings, cultural practices, local leadership structures and gender norms were acknowledged. The agreement set out the terms of monetary compensation

for those artisans who took part in the project and stated that the design, exhibition and future upkeep of the installation are subject to the community's approval (Cooke & Kothari, 2001). The purpose of these measures was to reduce the use of extractive research methods and ensure the long-term ownership of the community and mutual trust.

4. Design Framework and Results

4.1 Concept Development

The idea of *Resilient Threads of Manchar Lake* was conceived as a participatory installation on-site, reflecting the multi-faceted nature of the relationships between ecological sustainability, cultural identity and women's resilience. It was inspired by the traditional houseboat of Mohana, which symbolises the dependence of the community on the lake and the uncertainty caused by the continuing environmental degradation.

The project's metaphor was based on *rally* quilting. Just as the individual fabric fragments were stitched together to form the entire fabric, the installation acted as a symbolic gesture of the collective efforts to reconnect the divided relationships between people, culture and the natural environment. The artwork thus conveyed a sense of resilience, both as a material artefact and as a product of group co-creation.

4.2 Materials and Artistic Components

The pieces installed used reclaimed wood, handcrafted panels of textiles, crocheted decorative accents and ornaments from ceramic. The reclaimed wood represented environmental recovery and sustainable resource use, and the ralli quilts contained traditional textile knowledge and visually represented community experiences. The ecological value of Manchar Lake was emphasised with the presence of ceramic fish, birds and water-related motifs.

Environmental considerations and a desire to tie the artwork into its local landscape were considered, and locally available or recycled materials were used as a priority. The use of modular textile panels enabled continued community involvement and future maintenance and replacement following completion, further aiding the project's sustainability.

4.3 Environmental Storytelling and Community Engagement

The conceptual centre of the installation was the environmental storytelling. The artwork did not just convey ecological decline through data alone; it also was a visual story of what the community had experienced that visitors could emotionally connect with. Fish, waves, migratory birds, traditional boats, and everyday life were depicted in textile motifs, which symbolised environmental change and cultural resilience.

To support the installation, a set of community workshops, storytelling sessions and learning activities were identified to spark conversations between local communities, visitors, researchers, and policymakers. The activities sought to build awareness of the environment and to promote intergenerational knowledge transfer and cultural preservation.

4.4 Proposed Evaluation Framework

This study adopted a research-through-design approach where standard empirical fieldwork data was replaced by the validation of the framework and the expected social and ecological results of the design. A multi-dimensional impact matrix was created to assess the effectiveness of the framework after implementation (Table 2). The matrix is used to evaluate the operational aspects of how well the participatory art installation is doing in three different areas: social, cultural, and environmental.

Table 2: Framework Evaluation and Projected Impact Matrix

Evaluation Dimension	Targeted Socio-Artistic Asset	Verification Indicators & Methods
Social (Women's Empowerment)	Enhancement of agency, expansion of collaborative networks, and financial equity.	* Post-intervention qualitative interviews confirming increased perceived self-efficacy. * Equitable compensation distribution logs. * Emergence of independent artisan

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		clusters.
Cultural (Heritage Preservation)	Intergenerational knowledge transfer and material conservation.	* Documentation of active participation by younger Mohana women in <i>ralli</i> quilting workshops. * Integration of traditional motifs into contemporary artistic formats.
Environmental (Storytelling Advocacy) /	Public engagement and elevation of local ecological discourse.	* Quantitative tracking of exhibition visitorship. * Media coverage metrics. * Engagement logs detailing interaction between local community representatives and environmental policymakers.

Methodological Finding: This framework was built around its non-extractive operational posture, and it was this which provided structural validity for it. The delegation of physical authority to the community meant that the installation would not become an ethnographic product but rather function as a dynamic, local medium of engagement in environmental activism.

5. Discussion

The Resilient Threads of Manchar Lake initiative proposed a 'one size fits all' approach to environmental, cultural and women's empowerment fields, using participatory craft-based art as an interdisciplinary mechanism. This approach was different from traditional environmental awareness campaigns, which focused on scientific facts or policy communication, by involving local communities in the production of knowledge and artistic creation. It was through this that Mohana women were put at the centre of their own creation instead of being beneficiaries, and indigenous craft traditions were seen as potential cultural resources that could create social and environmental impact.

The created model closely matched participatory design principles which focused on collaboration and shared ownership and collective decision-making throughout the creation process (Sanders & Stappers, 2008). Engaging with the artisans from concept to implementation ensured community agency and ensured the final installation was culturally authentic. These collaborative practices are becoming more and more acknowledged as key drivers for creating design interventions which are socially responsive and have a meaning that goes beyond the span of externally funded projects.

The framework also helped to broaden the field of 'eco-art' as a model for the possibilities of environmental storytelling as grounded in local cultural practices (Lippard, 1997). The installation did not only present ecological degradation in terms of scientific information but also in terms of materials, symbols, memories and narratives which came straight from the lived experience of the Mohana community. The incorporation of creative expression into the indigenous knowledge was a promising way to enhance public awareness of environmental issues and, at the same time, help to retain intangible cultural heritage that could be lost.

The project did not only contribute to income generation but also to participation, recognition and creative leadership in general (Kabeer, 1999). Traditional ralli quilting and crochet were offered as more than just handicrafts but as a source of cultural knowledge and a manifestation of community identity. The framework allowed for the participation of public exposure and recognition of artisans as co-creators of the design process, encompassing wider aspects of empowerment such as agency, confidence and social recognition.

Despite these strengths, the study was conceptual in nature and needed to be validated in the field through execution of physical studies. There is a need to assess the impacts of future evaluation on community ownership, visitor engagement and longer-term impacts of cultural preservation and environmental awareness. The assessment of these outcomes in quantitative and qualitative ways will further substantiate the evidence base for participatory eco-art interventions, and the framework would be adaptable to other communities in environmental vulnerability.

Practical Implications

The framework provided useful recommendations to designers, artists, non-governmental organisations, and development practitioners who wanted to design and implement community-based environmental communication. A similar approach may help reinforce local livelihoods and foster heritage preservation and sustainable community engagement by incorporating traditional crafts into participatory art. The framework also laid the groundwork for interdisciplinary cooperation of artists, environmental groups, schools and citizens.

Policy Implications

The results emphasised the relevance of integrating cultural heritage and indigenous knowledge into environmental conservation policies. Policymakers need to acknowledge that community-based artistic programmes are an additional asset to sustainable development, especially in environmentally vulnerable areas where cultural identity and environmental sustainability are interlinked. The implementation of cultural heritage programmes, creative industries and CL EE for supporting women artisans proved to be viable approaches for realising wider sustainable development goals.

6. Conclusion

Resilient Threads of Manchar Lake was a conceptual research framework for designing a participatory craft-based art project that addressed the issues of women's empowerment, the story of the environment and cultural heritage through a research-through-design process. The framework drew on principles of participatory design, socially engaged art, eco-art and women's empowerment to show the potential for meaningful engagement between environmental sustainability and community resilience through collaborative artistic practice. The project's emphasis on Mohana women as co-creators and custodians of indigenous textile knowledge fostered a culturally responsive approach to environmental communication that emphasised local knowledge, shared authorship, and collective creativity.

While the framework will need to be assessed in the long term following the fieldwork, it provided a replicable model for community-based artistic work in environmental risk areas. Further studies are needed to investigate its sustainability in promoting women's role in participation, traditional crafts, environmental awareness and sustainability over the long run. An integration of CH and participatory design demonstrated clearly the potential to contribute to the enrichment of SD strategies and the inclusion of local communities as active partners in their own environmental and cultural futures.

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