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ECOLOGICAL IDENTITY IN TRANSITION: FAMILY ROLES IN SHAPING CONSERVATION AWARENESS UNDER ENVIRONMENTAL CHANGE

[1]Kukuh Setyo Pambudi, [2]Fara Marisha, [3]Shahnaz Sarah Darmawan, [4]Basma Tania, [5]Asruhrohtun Taufiddiah, [6]Saleha Binti Idris
[1,2,3,5]Universitas Negeri Malang, Malang, Indonesia,
[4]Center for Social Psychology and Society, Malang, Indonesia,
[6]Universiti Sains Islam Malaysia, Nilai, Negeri Sembilan, Malaysia
Corresponding Email: kukuh.setyo.fpsi@um.ac.id

ABSTRACT
Climate change has intensified hydrometeorological hazards in coastal regions of Malang Regency, East Java, with Gedangan Sub-District experiencing recurrent floods that disrupt livelihoods and reshape environmental perceptions. This study explores how families and community-based initiatives jointly foster ecological identity transformation under conditions of climate variability. Using a participatory qualitative design, data were collected through in-depth interviews and observational engagement with households and the Tegalsari Maritim community grassroots organization dedicated to riverbank restoration and watershed conservation. Findings reveal a psychosocial shift from viewing nature as a source of threat to embracing it as a relational entity requiring care, a process mediated by family-level value internalization and reinforced through intergenerational community practices such as tree planting and riparian management. These routines not only strengthen pro-environmental norms but also contribute to physical ecosystem recovery. The study underscores the role of family–community collaboration as a scalable model for ecological education and climate adaptation. Policy support and sustained funding are recommended to expand similar initiatives, alongside further research on the psychosocial impacts of family engagement in conservation.

Keywords: climate adaptation; community-based conservation; ecological identity; family socialization; participatory research.

INTRODUCTION
Climate change constitutes one of the most critical environmental challenges of our time, exerting profound and multidimensional impacts on ecosystem sustainability and human livelihoods. At its core, climate change is driven by global warming—a persistent rise in the Earth's average temperature caused by the accumulation of greenhouse gases such as methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O). These gases originate primarily from anthropogenic activities, including deforestation, fossil fuel combustion, excessive use of chemical fertilizers, industrial processes, and environmentally unsound waste management practices (Leontinus, 2022). The consequences of climate change extend beyond ecological degradation, permeating social and economic systems (Anggraeni, 2023). Among its most visible manifestations is sea-level rise (SLR), which threatens coastal ecosystems and communities dependent on marine resources.

In addition to rising seas, climate change has disrupted precipitation patterns, leading to earlier onset and shorter duration of rainy seasons, coupled with increasingly extreme rainfall events (Suhadi et al., 2023). According to Indonesia's Meteorology, Climatology, and Geophysics Agency (BMKG), approximately 67% of the country is projected to experience annual rainfall exceeding 2,500 mm (BMKG, 2024). These hydrological shifts accelerate runoff into coastal zones, intensifying flood risks and undermining the socio-economic resilience of productive coastal areas—impacting food security, public health, and community well-being (Purwanto & Suryanto, 2012).

Email Corresponding:
kukuh.setyo.fpsi@um.ac.id
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Such dynamics are evident in Malang Regency, East Java, a region characterized by extensive river basins and a southern coastal belt. Seasonal floods have become recurrent, damaging agricultural land, inundating settlements, and disrupting daily life. Over time, these disasters have altered local perceptions of rivers—from vital resources to feared agents of destruction. This perceptual shift underscores the urgency of fostering ecological awareness and adaptive behaviors that transcend technical flood mitigation, embedding environmental stewardship within social and cultural systems.

Within this transformative process, families play a pivotal role as primary agents of ecological socialization. As the first site of value internalization, families shape environmental attitudes through everyday practices—such as sweeping yards, planting trees, and proper waste disposal—gradually cultivating ecological sensitivity that evolves into an ecological identity (Wattimena et al., 2021). This identity transition, conceptualized as ecological identity in transition, reflects a psychosocial reorientation wherein nature is reframed from an exploitable object to a relational entity requiring care and reciprocity (Shephard, 2016). When consistently reinforced, these values foster generations that perceive conservation not as an occasional act but as an integral component of lifestyle.

Community-based initiatives amplify this process. For instance, Tegalsari Maritim, a grassroots collective in Umbulrejo, Gedangan, emerged in 2022 as a response to recurrent floods and riverbank erosion. With approximately 30 members, the community organizes bi-monthly conservation activities—such as tree planting and spring preservation—while engaging local residents, particularly youth (Tabloid Pilar Post, 2023). These practices transcend mere communal action, embedding ecological values within family systems and intergenerational routines (Scopelliti et al., 2022). Consequently, rivers once perceived as sources of disaster are reimagined as lifelines and blessings, catalyzing both environmental consciousness and local economic revitalization (Celidwen & Keltner, 2023).

Building on these observations, this study seeks to examine the role of families in shaping conservation awareness amid climate-induced environmental change. While previous research on climate change adaptation and environmental conservation has predominantly focused on institutional, economic, and community-level factors, limited attention has been given to the family as a primary agent in the formation and transmission of ecological values, particularly within disaster-prone coastal communities. Moreover, the psychosocial processes through which ecological values emerge, transition, and consolidate over time through sustained community engagement remain insufficiently understood. Addressing this gap, the present study explores how ecological values emerge, transition, and consolidate through sustained community engagement, offering insights into the psychosocial mechanisms underpinning adaptive capacity in disaster-prone coastal regions. In doing so, it contributes a novel perspective by integrating family socialization, conservation awareness, and climate adaptation into a unified framework for understanding resilience in the face of environmental change.

METHOD

This study adopted a participatory qualitative research design, which emphasizes collaboration between researchers and community members to co-produce knowledge and foster action-oriented outcomes (Caggiano & Weber, 2023; Vaughn & Jacquez, 2020). Such an approach is particularly relevant for environmental psychology and disaster studies, as it values local knowledge and addresses power asymmetries in research (Ratcliffe et al., 2024). The study was guided by principles of Community-Based Participatory Research (CBPR), whereby community members were involved not only as research participants but also as partners in identifying local environmental issues and reflecting on the findings.

Research Site

The research was conducted in Gedangan District, Malang Regency, East Java, Indonesia, a coastal and rural area highly vulnerable to climate-related hazards. Gedangan has experienced severe flooding events, partly driven by climate change and land-use changes, which have disrupted local livelihoods and ecological stability. In recent years, environmental changes

associated with climate variability and land-use transformation have significantly affected local livelihoods, particularly among fishing and farming households. The area was selected because of its active community-based conservation initiatives and its vulnerability to recurring environmental disturbances.

Community Partnership

The study was implemented in collaboration with Tegalsari Maritim, a local community organization engaged in coastal conservation, mangrove restoration, environmental education, and disaster preparedness programs. The organization facilitated access to local communities, assisted in participant recruitment, and contributed contextual insights throughout the research process. This partnership promoted cultural sensitivity, reciprocal learning, and community empowerment, which are central principles of participatory and CBPR approaches (Cargo & Mercer, 2008; Pollock et al., 2019).

Participants and Data Collection

Participants consisted of families residing in disaster-prone areas of Gedangan. Data collection conducted in 2025 employed multiple qualitative techniques:

1. In-depth interviews with family members across generations to explore narratives of ecological identity, solastalgia, and conservation practices.
2. Participatory observation during community-led conservation and disaster preparedness activities.

Data analysis followed a reflexive thematic analysis approach as proposed by Braun and Clarke (2022). Data triangulation was achieved by comparing findings across in-depth interviews and participatory observations. Regular discussions with community partners were also conducted to validate interpretations and enhance the credibility of findings.

Ethical Considerations

Ethical approval was obtained from the relevant institutional review board prior to data collection. All participants received information regarding the study objectives, procedures, potential risks, and their right to withdraw at any time. Written informed consent was obtained from all participants, and pseudonyms were used to protect confidentiality and anonymity.

RESULTS AND DISCUSSION

Malang Regency, located in East Java, has become increasingly vulnerable to climate-related disasters, most notably floods and landslides. Among its most affected areas is Gedangan Sub-District, situated in the southern part of Malang. The region's geomorphology comprises approximately 40% lowland and 60% undulating hills, with an average elevation of 350 meters above sea level and an annual rainfall of around 1,690 mm. Covering a total area of 20,171 hectares, Gedangan encompasses eight villages: Gedangan, Segaran, Sumberejo, Sidodadi, Gajahrejo, Sindurejo, Tumpakrejo, and Girimulyo. Its coastal stretch spans roughly 12 kilometers, intersected by multiple river systems, including the Pangaluran, Pakem, Lesti, and Gajahrejo Rivers.

This geographic configuration underpins both opportunity and risk. On one hand, the abundance of rivers and coastal resources sustains local livelihoods through fisheries and tourism. On the other hand, prolonged and intense rainfall during the monsoon season frequently triggers river overflow, resulting in recurrent flooding. Historical records illustrate this pattern: in 2021, flooding occurred in Gedangan Village following the overflow of the Pakem River, fortunately without fatalities. In 2022, Sidodadi Village experienced inundation up to 1–1.5 meters, affecting 60 households and severing local access routes. Subsequent years saw similar events: in 2024, heavy rainfall caused river surges in Gajahrejo Village, with floodwaters reaching 30–50 cm and claiming one life due to electrocution following a fallen power pole. Most recently, in September 2025, floods again struck Sidodadi and Gajahrejo, submerging 45 homes under 60 cm of water, reinforcing the observation that the Pangaluran River overflows annually.

Figure 1: The 2022 Flood in Sidodadi Village.



Source: Instagram (@polresmalang_polisiadem), 2022.

In 2024, intense rainfall triggered the overflow of rivers surrounding Gajahrejo Village, resulting in floods with water depths ranging from 30 to 50 centimeters. The disaster claimed one life when a resident was swept into the river's strong current and fatally electrocuted after a power pole collapsed into the floodwaters.

Figure 2: The 2024 Flood in Gajahrejo Village.



Source: TagarJatim.id, 2024.

In September 2025, severe rainfall caused rivers in Sidodadi and Gajahrejo Villages to overflow, inundating approximately 45 homes under floodwater reaching 60 centimeters. Reports indicate that the Pangaluran River has exhibited a recurring pattern of annual overflow, perpetuating flood risk across the region year after year.

Figure 3: The 2025 Flood in Sidodadi and Gajahrejo Village.



Source: Tugumalang.id, 2025.

The persistence of these disasters underscores the inadequacy of purely technical interventions and calls for a behavioral and socio-cultural shift in environmental governance. Beyond structural measures, fostering ecological awareness and adaptive practices among residents is imperative. This transformation must begin at the micro-social level—within families—where environmental values are first internalized and transmitted across generations. By embedding pro-environmental norms in daily routines and extending these practices through community-based initiatives, such as collaborative riverbank restoration and watershed conservation, Gedangan can strengthen its ecological identity and resilience against climate variability.

DISCUSSION

The series of major floods between 2021 and 2023 in South Malang—especially in Gedangan and adjacent sub-districts—appears to have reconfigured local understandings of environmental care from a peripheral concern into a lived imperative. In November 2021, flash floods associated with intense rainfall led to evacuations across Malang Raya; impacts rippled from Batu to Malang City, illustrating the basin-scale nature of hydrometeorological risk (ANTARA News, 2021; VOI, 2021). In October 2022, eight southern sub-districts—including Gedangan, Sumbermanjing Wetan, Pagak, Bantur, Tirtoyudo, and Donomulyo—were hit by overflow and flash floods, with thousands of households affected and emergency status declared; regional and ASEAN disaster databases corroborated wide impacts and infrastructure damage. These events made flood risk tangible at the household level (ADINet/AHA Centre, 2022; Liputan6.com, 2022). In July 2023, further flooding and landslides cut access roads (e.g., Sitiarjo–Gedangan), inundated homes in Sidodadi and Rowotrate, and affected thousands across at least 21 villages, reinforcing the perception that extreme water is no longer exceptional (IDN Times Jatim, 2023; TIMES Indonesia, 2023).

From a risk-driver perspective, community members increasingly tie these recurrent events to environmental degradation and climate variability, a convergence that is broadly consistent with national diagnostics. Indonesia's Climate and Development Report highlights flood as the dominant climate hazard, aggravated by land-use change, watershed degradation, and urban encroachment (World Bank, 2023). Complementing this, an ITB national study on adaptation governance underscores the need to strengthen local metrics and financing for risk reduction—precisely where community initiatives in South Malang are emergent but under-resourced (Suroso et al., 2021). Official communications have been similarly blunt: National Disaster Management Agency (BNPB) cautioned in 2022 that East Java's flood trend will persist "as long as there is no environmental improvement,". A message community in Gedangan increasingly echoes in their everyday discourse and practices (BNPB, 2022). While attributing a specific flood to anthropogenic climate change is methodologically complex—hydrology, land cover, and infrastructure mediate rainfall–runoff relations—there is growing evidence of increasing frequency and intensity of heavy rainfall extremes in Indonesia, alongside scholarly calls to embed multi-driver attribution into policy (Carbon Brief, 2024; Hendrawan et al., 2025; Humaira & Rizkillah, 2025; Scussolini et al., 2024).

At the psychosocial level, the narratives we heard map closely onto solastalgia—distress experienced as one's home environment is transformed—yet they also reveal adaptive identity work in families. International literature shows that environmental loss can evoke grief, sadness, and powerlessness, but also mobilize repair motives and stewardship when social meaning-making is supported (Galway et al., 2019; Stanley et al., 2024). Recent psychometric advances (e.g., the Brief Solastalgia Scale) offer concise tools to document such distress and track change in the wake of disasters, which can be useful for program evaluation in places like Gedangan (Christensen et al., 2024). Methodologically, environmental psychology's renewed emphasis on qualitative inquiry—to centre seldom-heard voices and reflexivity—supports interpreting flood experiences not just as "impacts" but as identity transitions (Ratcliffe et al., 2024). Taken together, these strands help explain why repeated floods have shifted ecological

identity among families from "nature as backdrop" to "nature as kin/responsibility," reframing conservation from optional to normative action.

In this setting, the family emerges as a pivotal socialization unit translating distress into conservation awareness and practice. Evidence from Indonesia indicates that injunctive and descriptive family norms shape Gen-Z intentions and behaviors toward pro-environmental action; social media can amplify these intentions into practice (Suminar et al., 2024). Likewise, intergenerational environmental education can spill over from children to parents, altering household water-saving routines—a mechanism highly relevant in flood-prone villages that also face dry-season scarcity (Husin et al., 2025). Studies on children's environmental identity show outdoor learning and routine practices (waste sorting, riverbank clean-ups) consolidating pro-environmental self-concept, which families can scaffold within everyday chores (Lestari et al., 2024). These findings resonate with the Gedangan case, where Tegalsari Maritim and allied groups have organized repetitive, family-inclusive plantings along Sungai Bajulmati and other riparian strips—small acts that recur fortnightly and are narrated as *merawat kampung* (caring for the village) after floods (WALHI Jatim, 2025). The key insight is that flood memories, when held within family narratives, appear to lower the threshold for conservation actions (e.g., tree-planting, waste gatekeeping at home, monitoring river levels), moving them from episodic campaigns to habitual practices.

The participatory character of recent initiatives matters. Community-based participatory research (CBPR) emphasizes co-decision, shared ownership, and action orientation; it is well suited to disaster-affected settings where trust and situated knowledge are crucial (Vaughn & Jacquez, 2020) . Environmental research has also clarified how qualitative participatory methods (visual elicitation, story circles, process mapping) help communities surface causal logics linking land clearing, river siltation, and localized flood peaks, thereby refining the target of conservation (Caggiano & Weber, 2023; Courtney et al., 2024). Beyond research, policy toolkits endorse community-centred mitigation—e.g., United Nations Office for Disaster Risk Reduction's (UNDRR) compendium on community-based DRR and the U.S. Environmental Protection Agency's (U.S. EPA) smart-growth guidance on steering development away from hazard zones—both of which align with South Malang's need to couple ecological restoration with settlement planning (UNDRR & G20 Disaster Risk Reduction Working Group, 2024; U.S. EPA, 2024).

Tegalsari Maritim exemplifies this approach. Formed out of concern for environmental degradation in coastal and watershed areas, the community conducts activities such as tree planting, spring conservation, and environmental education for local residents. Its conservation schedule—twice monthly on the 1st and 15th—often follows informal evening discussions and coffee gatherings, fostering social cohesion before morning restoration work. Typical tasks include sowing plant seeds to reinforce riverbank stability and prevent landslides during floods. These sustained efforts have attracted partnerships with universities (e.g., Widyagama, Universitas Negeri Malang, Universitas Brawijaya, Universitas Raden Rahmat) and NGOs such as World Alliance for Living Environment Indonesia (WALHI) Surabaya (Tabloid Pilar Post, 2023). With 23 members certified as nationally recognized ecotourism guides and formal legal status granted by the Ministry of Law and Human Rights, Tegalsari Maritim has evolved into a credible community-based environmental organization, opening pathways for training, funding, and broader institutional support (Paramita, 2023).

Locally, river and watershed conditions are a concrete hinge between floods and conservation consciousness. Studies on the Penguluran River (which drains Sitiarjo–Gedangan) point to riverbed siltation and inadequate bank vegetation as proximate drivers of overflow risk, and they prioritize capacity-building and volunteer disaster teams as first-line mitigation (Utama et al., 2020). Regional assessments of watershed carrying capacity in Greater Malang similarly diagnose low vegetative cover and high erosion indices; they advocate land cover restoration and better soil conservation to reduce runoff (Kurniawan et al., 2024). Such technical findings converge with what families are already intuiting post-flood: plant more trees, protect riparian buffers, and stop treating rivers as waste conduits—practices that not only manage hydrological peaks but also restore a sense of ecological identity.

This study is limited in its focus on family-level psychosocial processes in shaping ecological values and conservation awareness within climate-vulnerable coastal communities, which may not fully capture the influence of broader structural and institutional factors on environmental adaptation. In addition, the analysis centers on the emergence and transformation of ecological values through family and community interactions but does not extensively address variations across different cultural and socio-economic settings that may affect how such values are formed and sustained. Furthermore, the emphasis on intergenerational processes provides limited consideration of external determinants such as policy frameworks, governance systems, and economic pressures that also contribute significantly to conservation behavior and adaptive capacity.

CONCLUSION

This study demonstrates that climate change manifested through the intensification of flooding in coastal areas of Malang Regency, particularly Gedangan Sub-District has fundamentally reshaped community perceptions of the environment. The findings indicate a gradual shift in environmental meaning-making, where nature is no longer perceived solely as a source of risk, but increasingly recognized as a fragile system that requires collective care. This transformation is linked to the internalization of ecological values within family systems, where everyday practices such as waste management, environmental discussions, and participation in conservation activities serve as key mechanisms of environmental socialization. Through these processes, residents have experienced an ecological identity in transition: a shift from viewing nature as a source of threat to recognizing it as a vital entity that must be protected. Families play a critical role in fostering sustainable conservation awareness by embedding pro-environmental behaviors into everyday routines from an early age. Intergenerational community activities—such as riverbank restoration and regular tree planting—not only reinforce ecological identity but also contribute to tangible improvements in physical environmental conditions. At the community level, engagement in Tegalsari Maritim (KTM) initiatives—particularly mangrove restoration, riverbank rehabilitation, and tree-planting activities—further reinforce these family-based values and strengthens collective ecological identity. Overall, the study highlights that ecological awareness is not only individually developed but is continuously reproduced through the interaction between family socialization and community-based environmental action.

The implications are clear: collaborative models that integrate family-based socialization with community-driven conservation, as exemplified by KTM, offer an effective framework for ecological education and climate adaptation at the grassroots level. Theoretically, this study contributes to environmental psychology and climate adaptation literature by illustrating how ecological identity is constructed through intergenerational family processes embedded within community conservation practices, while practically highlighting the importance of integrating household-level environmental education with sustained community-led conservation programs. Moving forward, sustained public policy support and long-term funding are essential to scale such initiatives across other vulnerable regions. From a policy perspective, local governments should support and institutionalize community-based conservation platforms such as KTM through long-term funding, technical assistance, and integration with formal environmental education in schools and village governance systems. Such support is essential to ensure continuity and scalability of grassroots ecological initiatives in other climate-vulnerable coastal areas. In addition, these findings align with global sustainability agendas, particularly the Sustainable Development Goals (SDGs), by emphasizing the role of community participation and education in strengthening climate resilience. The results also have implications especially in reinforcing the role of families as the foundation of character building, including the development of environmental awareness and sustainable behavior within resilient and quality families.

Future research is recommended to further examine how different socio-economic and cultural contexts influence the effectiveness of family-based ecological socialization, as well as to explore the long-term psychological, behavioral, and psychosocial impacts of sustained involvement of families in community-based environmental stewardship under accelerating

climate change conditions. Additionally, future studies should assess how these family and community-based approaches can be adapted, strengthened, and scaled across different regions to support broader climate adaptation strategies and enhance community resilience.

Artificial Intelligence (AI) Use Disclosure

The authors used an AI-based writing tool only to help improve language and grammar. All ideas, analysis, interpretation, and conclusions are entirely the responsibility of the authors. The tool was not used to generate data, conduct analysis, or replace the authors' critical thinking.

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