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Playful Mapping for Climate Adaptation: Two Case Studies From Jakarta's Coast

Annika Kühn[1] | Teresa Erbach[2] | Hilke Marit Berger[1] | Haratua Zosran[3]

[1]HafenCity University, Hamburg, Germany | [2]Research Institute for Sustainability (RIFS) at GFZ, Potsdam, Germany | [3]Freelance Artist, Jakarta, Timur, Indonesia

Correspondence: Annika Kühn (annika.kuehn@hcu-hamburg.de)

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ABSTRACT

While playful methods are increasingly used in participatory mapping processes, their strategic value, particularly in relation to climate adaptation, remains underexamined. This paper explores the potential and limitations of playful mapping approaches in climate adaptation, focusing on two qualitative case studies in Jakarta's flood-prone Kampung Akuarium: memory mapping with children and speculative gameplay with residents and government officials. Both approaches are examined in terms of their methodological strengths and weaknesses as well as their impact and scalability. The findings show that playful and participatory mapping tools open spaces for storytelling, imagination and collective reflection. They make visible immaterial cultural heritage and emotional aspects often excluded from technocratic planning, allowing participants to articulate the cultural dimensions of urban transformation. Yet, these insights often remain symbolic without pathways for institutional uptake. The paper argues that the context-specific potentials and the downsides of playful methods need to be evaluated carefully. Where their contribution to adaptation processes outweighs their resource-intensiveness, they should be treated not only as experiential formats but as strategic instruments embedded in long-term, co-creative research infrastructures.

1 | Introduction

Jakarta is a city shaped by water. Built on an alluvial plain, the city straddles 13 rivers that have long defined its rhythms and vulnerabilities. Flood events, historically known and expected, have become more frequent and severe since the early 2000s, primarily due to a combination of land subsidence, urban development and sea-level rise (Cao et al. 2021; Garschagen et al. 2018). These floods are therefore not purely due to global climate change. As Padawangi and Douglass (2015, 520) emphasise, 'flooding occurs in political space in both its origins and social consequences'. While groundwater extraction is a central driver of subsidence, political priorities have long delayed substantial investment in piped water infrastructure (Abidin et al. 2015; Colven 2020). The result of decades of infrastructural neglect is an exacerbation of environmental vulnerability, which is then mobilised to justify displacement—often of the very communities that have long been excluded from access to safe housing and public services. Environmental vulnerability and displacement thus are co-produced and often serve political and economic interests, legitimised through selective narratives of risk and climate adaptation (Padawangi and Douglass 2015; Saputra et al. 2025).

Nowhere in Jakarta are these dynamics more visible than in the north of the city, a low-lying coastal area home to a high concentration of kampungs (urban villages), many of which predate modern land regimes but are now considered informal. Kusno (2020) frames this condition through the concept of middling urbanism: a state of spatial and political in-betweenness

in which kampung dwellers negotiate between formality and informality, precarity and aspiration. This ambivalence makes kampung residents simultaneously vulnerable to state-led displacement and resilient in their strategies of adaptation and persistence (Kemmer and Simone 2021).

In North Jakarta, frequent flooding and pronounced coastal exposure have made climate adaptation a major priority, debated extensively at both municipal and national levels. Mapping plays a central role in these planning efforts, serving as an essential tool for measuring, regulating and controlling urban space. However, whether used to support eviction or redevelopment, maps reduce complex, lived environments to zones, coordinates and strategic assets. Conventional mapping often overlooks the intangible dimensions of urban life, such as cultural memory, shared rituals and emotional attachments to place. In this article, we propose an extension of the technocratic mapping tradition: We examine how playful mapping approaches can open new spaces for climate change-responsive urban transformation by reclaiming the right to map from below. Rather than measuring spaces, we analyse how they can be explored and discussed by using experimental and creative mapping methods. We investigate what mapping can become when it is treated as a tool for narration, identity-making and the assessment of cultural and social values.

Following a brief contextualisation of the research framework, the article firstly examines recent mapping processes in North Jakarta. It then offers a methodological reflection on playful mapping approaches. This is followed by an analysis of two use cases from Jakarta's Kampung Akuarium: *Our Coastal Neighbourhood*, a memory-mapping activity with children, and *up:town*, a speculative gameplay exercise with residents and government officials. We conclude with a discussion on the potential and limitations of the two approaches and a summary of key findings on playful mapping in climate adaptation. With this, we aim to contribute to ongoing debates on participatory mapping and the role of cultural and social values in climate adaptation by foregrounding playful methods as tools in the co-production of knowledge and space.

2 | Cultural Dimensions of Transformation in North Jakarta: The Sinking Cities Project

The following section introduces the *Sinking Cities* project, which provides the empirical foundation for the reflections and findings developed in this article. Framed as a transdisciplinary collaboration between scientific researchers, cultural institutions and artists, *Sinking Cities* explores how cultural heritage can serve as a resource for navigating urban transformation under climate pressure. Working in Jakarta, Bremen, and Alexandria, each city contributes its own thematic focus, shaped by the expertise and interests of local partners from art institutions, non-governmental organisations and invited artists. In Jakarta, the collaboration with the Rujak Center for Urban Studies has been central. As part of a growing 'right to the city' movement (Padawangi and Douglass 2015), Rujak advocates for the residents of Kampung Akuarium, an informal settlement in North Jakarta that was evicted in 2016 but later partly reclaimed by its former inhabitants with the support of civil-society groups and planners. A co-designed vertical housing project—Kampung Susun Akuarium—stands today as the first of its kind, a symbol of grassroots resilience and innovation (Sari et al. 2022). As part of the *Sinking Cities* project, Rujak extended this initiative by inviting artist Haratua Zosran to develop a project exploring how local cultural heritage can help communities cope with the loss of their homes and adapt to new environments shaped by climate adaptation policies and ideas of modernisation.

Following scholars such as Harvey (2001) and Lowenthal (2005), cultural heritage is understood here as a constantly changing collection of material and immaterial cultural goods defined by the people maintaining and passing on these goods to future generations. The focus is not exclusively on cultural practices and goods that have been officially recognised as such, but also on those that the local population describes as their cultural heritage. In the exchange with the residents of Kampung Akuarium and the Rujak Center for Urban Studies, it became clear that in the kampungs of North Jakarta, this encompasses community values such as gotong royong (a certain form of mutual aid), rituals, oral history and vernacular architecture (Pristine and Sutanudjaja 2024). This view contrasts with the city's official framing of heritage, which reflects Jakarta's colonial past. Kampung Akuarium is located in the Pasar Ikan Subzone, at the core of the Kota Tua Cultural Heritage Zone defined by the city walls, where conservation efforts focus on buildings from the Dutch era. Typically, a sense of responsibility and belonging toward cultural heritage emerges from personal and direct engagement with it (Dupeyron 2020). Yet residents—often with diverse maritime origins across the Indonesian archipelago—report minimal attachment to these colonial sites (Hasnawati and Rahardjo 2023). Recent government efforts to apply for World Heritage status by turning colonial heritage into a flagship, detached from local community relations, align with the political agenda of modernisation and westernisation. As elsewhere, this translates into the privatisation of land, the formalisation of settlements and economic activities and infrastructure development that is often promoted under the banner of sustainability (Leitner and Sheppard 2018).

Against this complex socio-political background, the *Sinking Cities* project focuses on the social and cultural resources of coastal kampungs, which shape community resilience and everyday adaptation strategies that often stand in contrast to official climate adaptation planning.

3 | Mapping North Jakarta

As Shatkin et al. (2023) argue, mapping practices have been instrumental in defining and reproducing informality in Jakarta, embedding it within planning processes that frame kampungs as spaces of exception or deficiency. In Kampung Akuarium in North Jakarta (Figure 1), authorities justified evictions through a complex narrative that linked flood protection, improvements in residents' living conditions, and the broader vision of a clean, green and modern waterfront—arguments typically used to legitimise evictions in the city (Kusno 2013). Re-examining the 2016 eviction of Kampung Akuarium reveals how power relations determine whether mapping functions as a tool of oppression or resistance. The clearance formed part of the National Capital Integrated Coastal Development (NCICD) plan, which

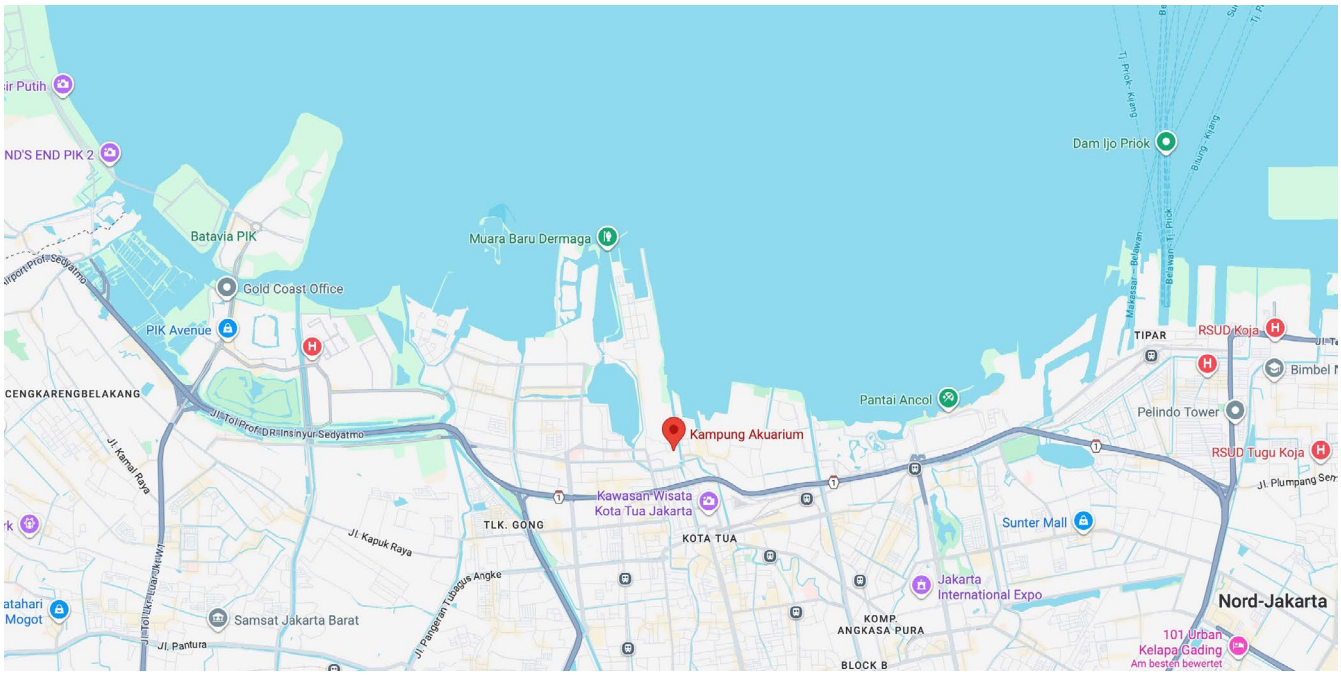

FIGURE 1 | Map of Jakarta Bay. *Source:* Google Maps.

envisioned embankments, polder systems and the reclamation of 17 artificial islands to protect Jakarta from flooding caused by land subsidence and sea-level rise.

The NCICD plan has changed repeatedly since its 2012 draft (see Figures 2 and 3), with different numbers of artificial islands and sea walls introduced without considering the impacts on the kampungs or even informing the population. In a *Sinking Cities* workshop, municipal and national government officials even presented different plans and maps of a future North Jakarta—not as drafts, but as finalised coastal protection strategies. Here, maps were utilised to impose a spatial order that ignored the lived realities of the community. This became particularly evident in the fact that the presented maps showed areas of open water in places where kampungs currently exist, without providing any plan for what would happen to the residents living there.

While coastal protection in Jakarta is an extremely difficult endeavour, fraught with political challenges, relying on maps alone for spatial planning—without incorporating data on the social and cultural context—results in an authoritative vision that overlooks the needs of shoreline communities (Figure 4). Scholars such as Hayes (2022) and Na'puti and Cruz (2022) point to the history of maps in colonialism, where they have served to advance and materialise settler-colonial and imperial power relations and violence. Maps have historically functioned as tools to transform a landscape into a territory—marking resources but not the people living there. In the case of the NCICD maps, resources and valuable assets such as the harbour or high-rise buildings on the reclaimed islands are rendered visible, whereas kampungs, as informal areas, are often misrepresented or omitted altogether (Shatkin et al. 2023). When layered on top of each other, the NCICD blueprint and the 2014 map of the Kota Tua Heritage Zone (Figure 5) reveal how past artefacts and future imaginations are projected from a satellite-like gaze that disregards lived realities in the present. The map depicts the full extent of the city wall, even where sections have been destroyed or obscured by vegetation, yet it omits the informal houses built next to or above the canals. The whole Kampung Akuarium is designated for 'revitalisation of slum areas to create canals and open spaces' (Appendix, Gov. Reg. No. 36/2014; translated by the authors)—a plan that led to the eviction two years later.

In contrast to these maps, the two playful mapping approaches developed as part of the *Sinking Cities* project seek to contribute to making the perspectives of Kampung Akuarium residents more visible and to bringing them into official planning processes. They aim to support existing efforts by highlighting residents' relationships with their local environment, as well as their social and cultural needs and resources.

4 | Theoretical Strands: Toward Playful Mapping

As artists such as Francis Alÿs have shown, even the simplest line on a map can have profound political and social consequences, demonstrating that mapping is always an act of world-making, not just measuring (Wood et al. 2010). Following Tim Ingold (2007), places should not be understood as fixed points or bounded territories, but as knots in a meshwork, formed by the lines along which life is lived. From this perspective, mapping becomes a way of tracing lines and relationships, movements and affective intensities, rather than indexing fixed locations or discrete actors.

By *playful mapping*, we refer to work in critical cartography and cultural geography that conceptualises mapping as a situated, processual and performative practice (e.g., Lammes 2015; Perkins 2013; Playful Mapping Collective 2016). This approach foregrounds cartographic practices, especially digital ones,

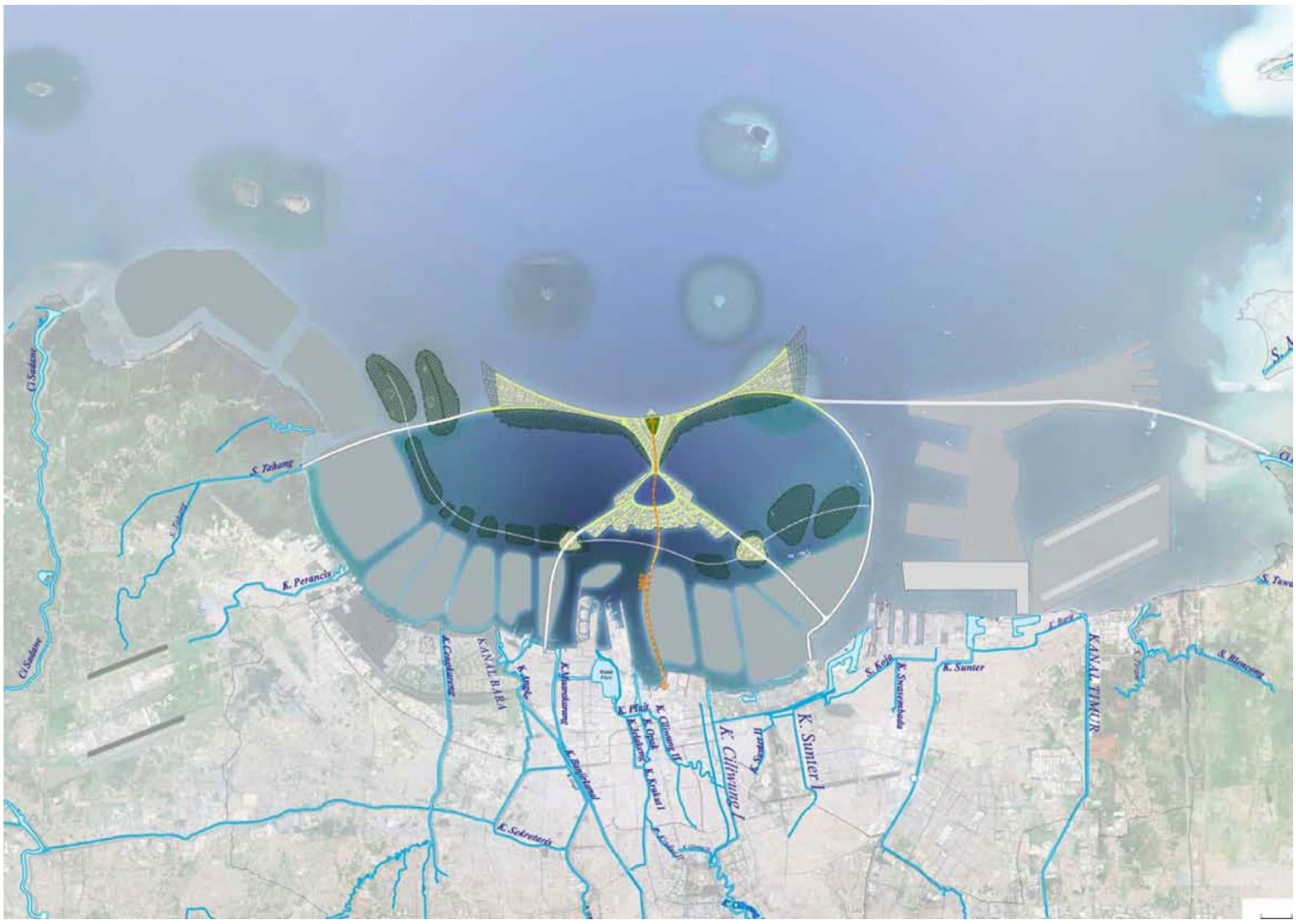

FIGURE 2 | Built coastal embankments in Jakarta Bay under NCICD (2019). *Source:* Laporan IFSP, 2019.

FIGURE 3 | NCICD plan as envisioned in 2014. Since then, the plan has changed multiple times, and the iconic bird-shaped design has been lost along the way. *Source:* Draft Master Plan (PTPIN), 2014.

while emphasising how participants co-create relations, meanings and futures through ludic engagement rather than merely producing static representations. It highlights the similarities between mapping and playing, where 'a map can easily become a game-board, and a playground can transform into a map' (Playful Mapping Collective 2016, 20), and traces connections between participants, environments and narratives, always attentive to power, facilitation and ethics (Dodge et al. 2011).

FIGURE 4 | Photograph of the wall in Kampung Susun Akuarium, where residents use various means to regain access to the sea, 2025. Annika Kühn.

While not all playful approaches explicitly adopt the term *playful mapping*, many operationalise mapping as an encounter that co-produces relations and imaginaries, even when the 'map' takes the form of a board, scenario or immersive world.

Here, playful mapping is understood as a creative practice with a playful attitude, rather than a narrow form of cartographic representation or conventional game. This aligns with what Harriet Hawkins (2019, 968) describes as the creative 'return' in human geography, a shift characterised by increasing engagement with artistic, embodied and practice-based methodologies. Creativity is thus not only an object of analysis but a means of producing geographic knowledge itself (Hawkins 2019). It aligns with artistic and speculative practices that expand the conceptualisation of maps from static, visual depictions of space to performative, situated and processual engagements with place and power (Kitchin et al. 2013; Wood et al. 2010). Through critical and playful practices, these methodologies challenge dominant cartographic conventions and question the presumed neutrality of formal spatial representations.

A significant strand within creative geography is *narrative cartography*, which traces heterogeneous lines in a playful and non-linear manner. It enables researchers and communities to embed stories of lived experience into spatial representations and foregrounds maps as storytelling devices (Caquard and Cartwright 2014; Pearce 2008). This opens space for marginalised voices, allowing underrepresented experiences to contribute to the production of spatial knowledge. Creative mapping thereby fosters inclusive engagements and positions participants' memories and everyday practices as co-creative forces. Yet, the tension between the linear logic of conventional maps and the non-linear flow of narrative remains a key challenge for scholars attempting to reconceptualise cartography as a dialogical, interpretative practice across a range of media (Pearce 2008).

Another strand of playful geography draws on game mechanics and speculative design to imagine alternative spatial futures. Building on Dunne and Raby (2013), maps become tools to explore what could be, rather than simply depict what exists. Speculative mapping embraces 'what if?' questions, allowing communities, researchers and artists to model scenarios, express desires and negotiate possible futures in experimental ways (Candy and Dunagan 2017). Playful futuring approaches can either foster public engagement and learning or, in the form of anticipatory governance, support policy processes (Vervoort et al. 2022). Imagination is not considered escapist but a tool for agency, enabling communities to articulate spatial futures and challenge exclusionary planning paradigms (Oomen et al. 2022). These approaches are often

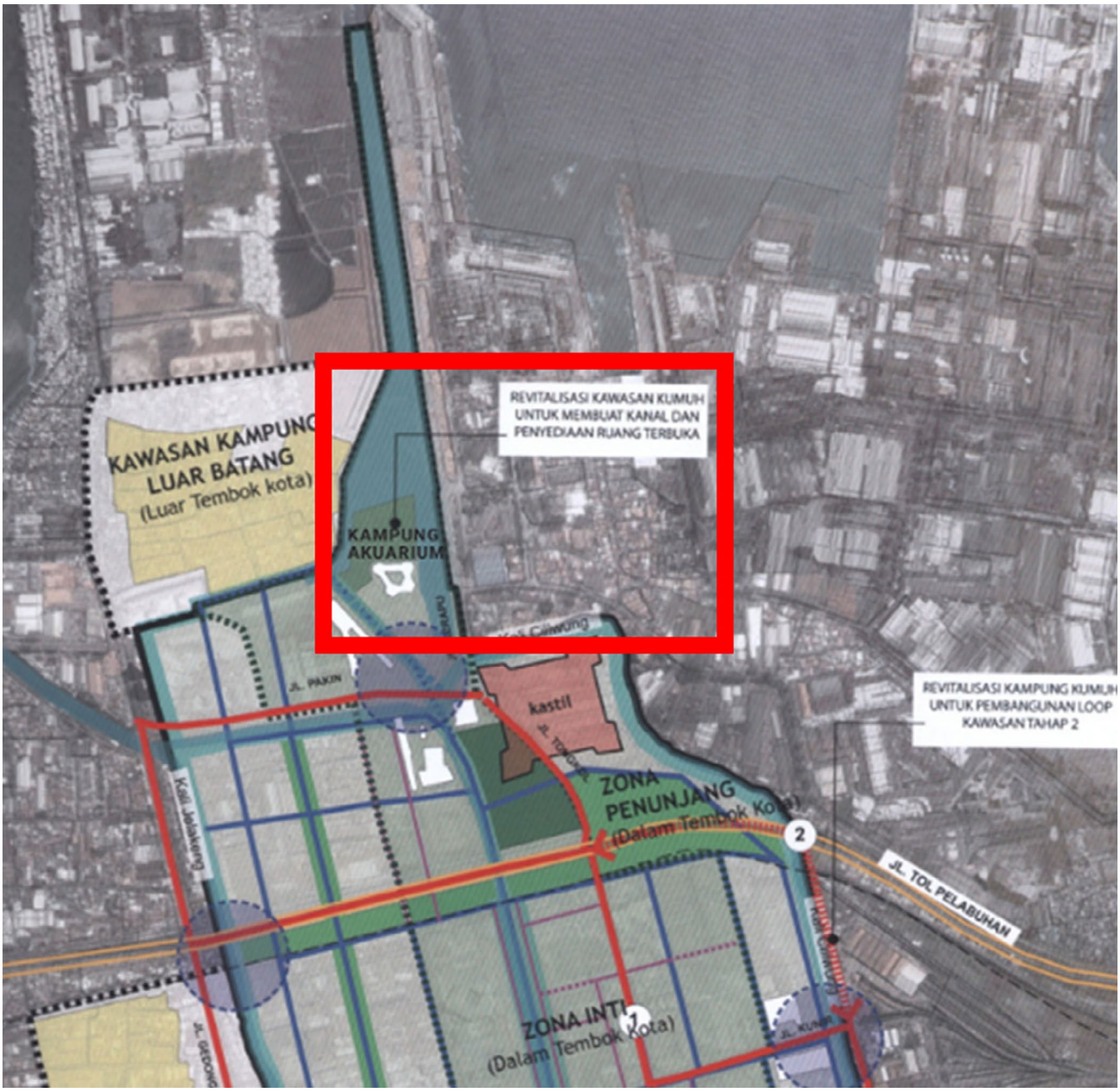

FIGURE 5 | Kota Tua heritage zones (Gov. Reg. No. 36/2014). Kampung Akuarium is designated for 'revitalization of slum areas to create canals and open spaces'. *Source:* Appendix, Gov. Reg. No. 36/2014; coloured by authors.

deliberately incomplete and open-ended, incorporating story-listening and storytelling practices that may enhance future literacy (Mangnus et al. 2021).

In the field of climate adaptation, there has been a growing interest in playful approaches, particularly gaming (e.g., Ampatzidou and Gugerell 2019; Fischer et al. 2024; da Silva and Valdes 2023; for an overview, see Flood et al. 2018; Forrest et al. 2022). These approaches typically aim to foster civic engagement, community resilience and adaptation literacy. Their playful nature creates space for participants to articulate concerns, desires and tensions, while granting them agency—an experience that can be both empowering and motivating (Gabrys and Yusoff 2012; Jasanoff and Kim 2015). Rather than focusing on technical details, they primarily address the social and cultural dimensions of climate adaptation.

Assessing, considering and discussing cultural and social values that people attach to places is a crucial step in developing locally specific adaptation strategies, as resilience often emerges from interactions between people and their environment at highly local and personal scales (Novaczek et al. 2011). However, these dimensions are context-dependent and mapping them requires local knowledge and the integration of diverse subjective perspectives (Adger 2006; Smit and Wandel 2006; Fresque-Baxter and Armitage 2012). While mapping approaches grounded in traditional social science methods aim to generate reliable data on cultural and

social values for governmental decision-making (e.g., Graham et al. 2014; Novaczek et al. 2011), playful approaches in this field are less concerned with capturing values as fixed entities. Instead, they seek to activate participatory processes that explore, share and reimagine cultural and social values, thereby supporting community education and resilience.

As creative methods gain visibility in geography, scholars warn against uncritical embrace. Singer et al.'s (2023) 'artographic' perspective centres history, power and epistemic justice, framing creativity as relational and politically embedded rather than neutral. Mapping becomes an intervention and world-making: a caring, reflexive practice attentive to failure and to participation (who, for whom, with what consequences). This echoes Hawkins' (2019, 975) caution that the creative turn should not become a brand or trend, but remain a critical practice grounded in politics, method, responsibility and the heterogeneity of practice. Creative mapping practices, especially those focused on narrative, speculation and critical artmaking, extend geography's methodological range and public relevance. They invite us to imagine and make space differently. Yet their power does not lie in novelty, but in their ability to disturb, reframe and reworld geographic knowledge from the ground up. As scholars and practitioners continue to refine these practices, the most meaningful maps may be those that not only describe space but also invite us to inhabit it otherwise.

To explore the cultural and social values of the inhabitants of Kampung Akuarium in North Jakarta—particularly their relationship to the changed environment after the eviction and to future scenarios of their neighbourhood—two playful mapping approaches were developed and applied in the *Sinking Cities* project: the workshop *Our Coastal Neighbourhood*, which elicits children's memories of displacement, sense of place and their relationship to cultural heritage (chap. 5); and the game *up:town*, which stages collaborative imaginings of urban futures with residents and government officials (chap. 6). Both approaches reflect a broader commitment within critical geography to research methods that emphasise dialogue, co-authorship and ethical engagement, aiming to resist extractive models of knowledge production and instead to foreground plural, lived realities and futures (Rose-Redwood et al. 2024; chap. 5.2). Building on the methodological reflections discussed above and a systematic analysis of the two formats according to the scheme proposed by Hofer and Kaufmann (2023),[1] the following two case studies focus on their potential and limitations.

5 | First Case Study From North Jakarta: Mapping Memories Through Play

The first case study introduces a memory-based mapping approach developed by Haratua Zosran, a Jakarta-based artist and researcher (and co-author of this paper). During a three-month residency at Rujak Center for Urban Studies, he explored how infrastructural interventions impacted the cultural identity of Kampung Akuarium's younger generation—in particular, the construction of coastal embankments that cut off residents from the sea and led to their displacement. Most of the former residents live today in the newly built Kampung Susun Akuarium, a vertical housing development constructed by the city on a small part of the former kampung in response to a campaign by various organisations (Sari et al. 2022). The former kampung area has changed significantly and is today also separated from the sea by a big concrete wall.

5.1 | Workshop *Our Coastal Neighbourhood*

In the two-day workshop *Our Coastal Neighbourhood*, with 11 children from Kampung Akuarium aged between 11 and 16, the artist engaged in a playful mapping scenario in a community space of Kampung Susun Akuarium to elicit children's memories of experiences in their aquatic neighbourhood and learn more about the interconnection of spatial and cultural loss. Drawing on Bodenhorn and Lee (2021), play is seen here as a means to trace children's embodied and affective familiarity and identity with place. The children were able to establish trust through an extended collaboration with the participating NGO and were familiar with the researchers and facilitators involved in the process. Prior to participation, families were fully informed about the project.[2] The children received compensation in the form of supermarket vouchers for their participation.

In tandem with curator Ashlay Yoon from Mekong Cultural Hub, a mapping game was developed using four instruments: flashcards, maps, bingo cards and photovoice. On day one, participants were asked to discuss and name 21 *flashcards* (see Figure 6) depicting objects, cultural practices and activities related to water and the sea.

The images on the cards had been painted by the artist during a residency in Kampung Akuarium and were based on interviews with adult kampung residents, who had been asked about what they perceive as their cultural heritage. By discussing the images with the young participants, the artist explored how the younger generation relates to the cultural heritage of older generations. Through the individual artistic design of the pictures, which made them more than mere symbols, he encouraged the participants not just to describe the images but to interpret them in their own way.

In a second step, to reflect on changes in everyday routines and the individual relation to locations, participants were encouraged to draw their everyday routes to playgrounds and schools prior to and following the eviction on three maps of different scales (see Figure 7). In this interactive mapping session, participants used creative materials and techniques to intervene in the map, to recall the meaning of sites and to consider how the eviction altered the relevance of locations.

On the second day, participants were asked to walk the drawn lines in the neighbourhood and take pictures, guided by *bingo cards* (Figure 8a,b) that displayed different categories, like water infrastructures ('*infrastruktur air*'), livelihood ('*mata pencaharian*') or cultural heritage ('*warisan sejarah*'[3]). Bingo cards as well as the photographs served as an inspiration and guideline for the following discussion within the community spaces of the kampung and allowed participants to reflect on both personal and community perspectives in relation to concepts like public space or heritage. This approach markedly draws from 'photovoice', a research methodology that emerged within community-based

FIGURE 6 | Flashcards. Haratua Zosran.

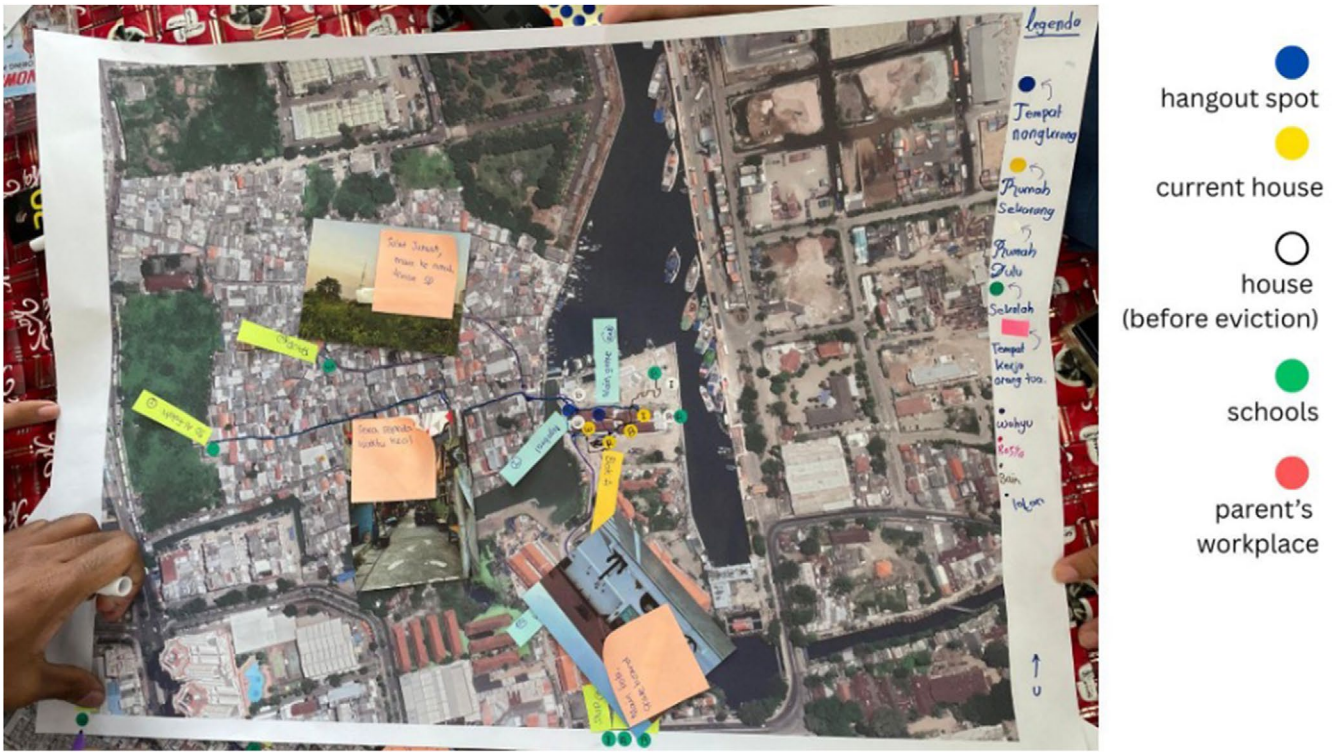

FIGURE 7 | Place-mapping session with a map of Kampung Akuarium. Haratua Zosran.

participatory research in the '90s as a tool for collective reflection and empowerment (Wang and Burris 1997). Photovoice, as a research method, offers participants the opportunity to take photographs that address community concerns. Here, it was chosen to invite collective reflection and facilitate multisensory experience: drawing and walking the lines on the map was intended to evoke multisensory memories by integrating tactile experiences, sounds and smells. The process encouraged critical dialogue, facilitated the exchange of knowledge about individual and collective challenges and allowed participants to create and lead a forum where

they could present their lived experiences and priorities using their own chosen images, language and context.[4]

In order to elicit the changes brought by the eviction to the participants' relation to their environment, each of the four instruments prompted children to revisit past routines and places—a process of reflection and memorising that was supported by questions such as 'What kind of games did you use to play here?' or 'What changed after the eviction?' which were asked by the workshop facilitators. In doing so, play served not only as a memory cue, but also as a relational method of mapping identity across disrupted geographies.

5.2 | Between Loss and Reinterpretation

Despite the potential of playful mapping to foster agency, there was one overwhelming topic: loss. This reveals how material infrastructures, like embankments, not only reshape physical geographies but also foreclose emotional attachments to place.

Within this workshop, loss was explicitly tied to participants' disconnection from the sea and rivers, which are difficult to access since the construction of new embankments following the community's eviction (Figure 9). Discussing the flashcards with the workshop participants (3–8 years old when the eviction

FIGURE 8 | (a, b) Bingo card containing categories for Photovoice (used in Indonesian). Haratua Zosran.

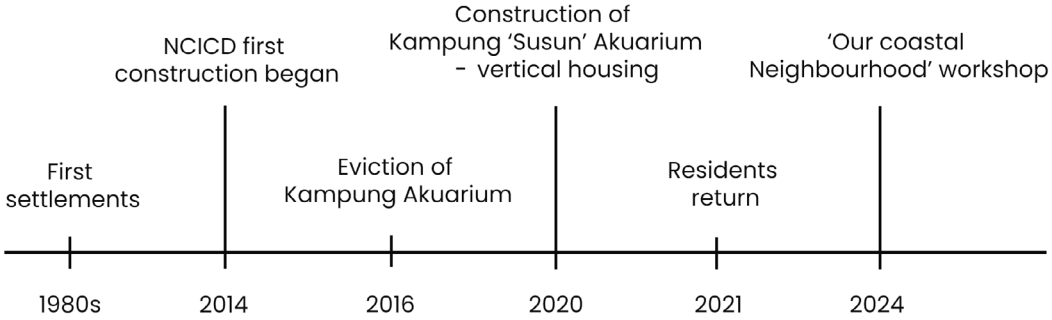

FIGURE 9 | Timeline of Kampung Akuarium eviction to return process. Haratua Zosran.

happened) reveals a loss of what the adults had identified as their cultural heritage (e.g., knowledge about water-related objects, cultural practices and places), as there are various parts of this heritage which the younger generation is not familiar with. In addition, the maps indicate a shrinking range of playgrounds and meeting places, especially close to the sea.

Children also reported that playing at the waterside is now unsafe because the embankments—about 3–4 m high and just 30 cm wide—make it hazardous to reach the sea. In addition, a water pump nearby runs constantly, causing a layer of clay and mud in which children can get stuck and drown along the seafront. This has left children deprived of the maritime childhood their parents recount, only able to reminisce about (and romanticise) what has been taken from them. Paradoxically, it is a generation of parents with a deep, long-standing connection to the sea who must now warn their children of its dangers. To discourage children from climbing the embankments, they sometimes use traditional stories like the ones connected to *pesugihan* and adapt them accordingly.[5]

The construction of embankments caused a gradual retreat from the sea, explicitly traced in the shift of participants' play-routes before and after the eviction (see Figure 10). This is linked to an inability to relate to these spaces, for example: the hangout spot near the fish market, where participants used to play marbles and climb coconut trees, is now abandoned because the garbage truck and coconut trees that characterised the spot are no longer there. As a result, children have become less inclined to engage with communal outdoor areas; instead, despite the expansive open spaces offered by the vertical housing, they increasingly retreat indoors or occupy themselves with school activities. The spatial reconfiguration thus not only disrupted physical routines but fundamentally reoriented children's practices of placemaking and social life.

The findings from the workshop and the interviews with adult residents in the preparation phase suggest that the eviction has not merely blocked physical access to the sea or disrupted the maritime economy but has fundamentally dislocated the social infrastructures through which community life had been sustained. Despite four years of resettlement in the vertical kampung, the community seems to not have recovered its former cohesion.

5.3 | Archiving Memories and the Limits of the Method

Drawing on the concept of 'microgeographies' (Matthews et al. 1998), mapping in this workshop enabled children to articulate their everyday spatial experiences—how they use, perceive and make sense of public spaces and their environment. In crisis situations, play is often the most meaningful way by which children transact with their environment (Chatterjee 2018); it therefore makes sense to assess their relations to places in playful settings. Through this process, the children produced symbolic and situated knowledge that reflected not only their patterns of movement and play but also their sense of participation, agency and informal ownership of specific places. By recounting personal experiences with what their parents' generation regards as their cultural heritage, they reinterpreted that heritage, attaching different meanings and experiences to the pictures than the older generation. Moreover, the official heritage sites—such as

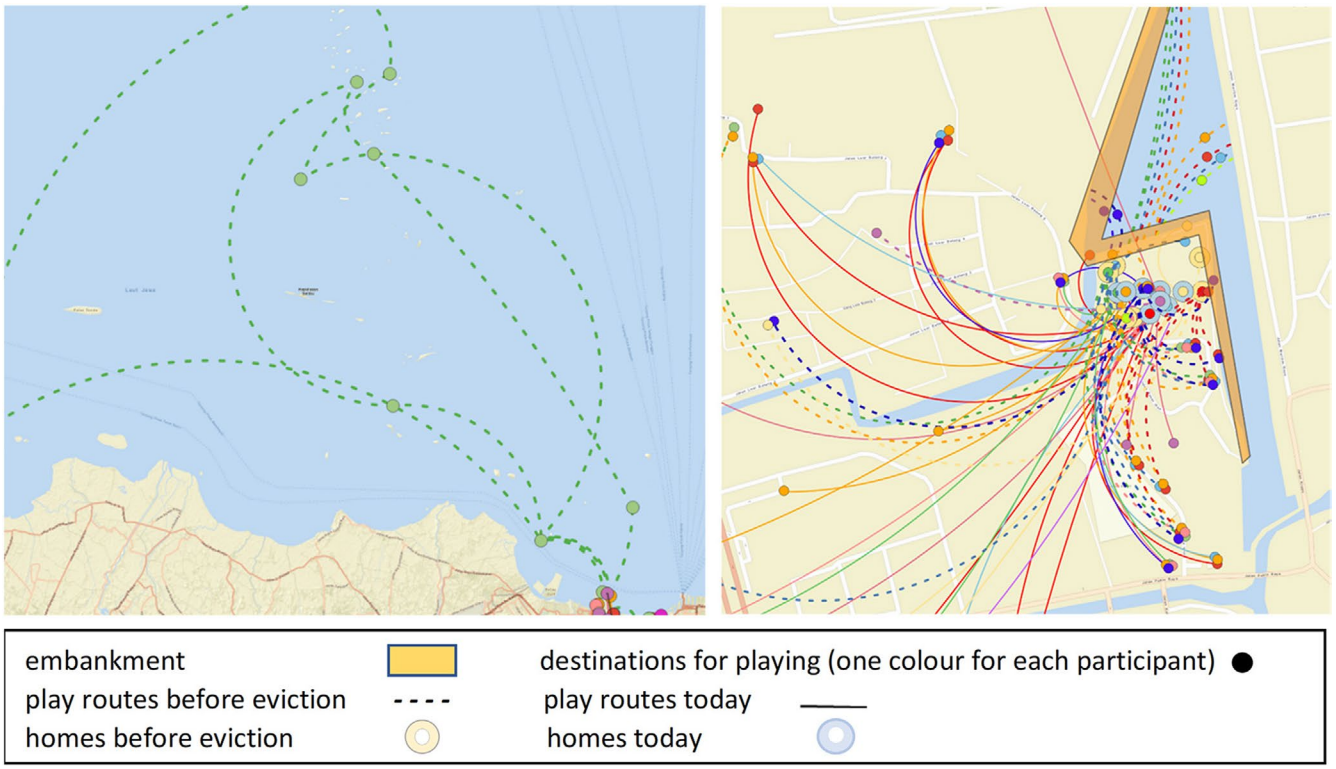

FIGURE 10 | QGIS on the participants' play route before and after the eviction showing the changes in regards to using water as a 'playground'. Haratua Zosran.

the old city wall or the maritime museum—appear to hold little importance for them.

While the workshop made visible what formal and informal cultural heritage children cannot connect with anymore, the method did not allow us to grasp what kind of new cultural bounds might emerge in the young generation. One reason for this could be that the flashcards focused on the cultural heritage of the older generation, so that possible new points of reference could not become visible. Although the participants interpreted the pictures in their own way, a consistent pattern or a new attribution of meaning did not emerge in their answers. What was notable, above all, was the loss of knowledge—for example, when participants were unable to identify fish species. The methods applied in the workshop also evoked deeply personal memories, including stories about the period of homelessness after the eviction. Broaching such experiences in the context of play is crucial for children that must deal with strong emotions and stress related to loss and trauma in the context of disasters and everyday crises (Chatterjee 2018). It is still questionable how far the participants have profited from a form of engagement with their past and current environment that focuses on knowledge production but limits it to a staging of nostalgia and mourning.

While it might be productive and empowering for some of them to articulate their personal relations to places, objects and cultural practices, it also risks entrenching a sense of irrevocable loss rather than opening paths for renewal. However, despite the focus on loss, the atmosphere was most of the time joyful and communal as both Haratua Zosran and the facilitator were familiar with the workshop participants and loosened up the workshop with small playful interventions and shared lunch. The workshop therefore might have been helpful in a process of coming to terms with the past, which is often a prerequisite for dealing with the future. Still, future iterations could include tools to actively stage spaces of collective imagination—allowing children not only to archive what was lost but to envision what could be reclaimed or remade anew.

6 | Second Case Study From North Jakarta: Imagining Futures Through Serious Gaming

The second case study centres on a role-playing game designed to engage adult participants in speculative urban futures. It presents a playful method situated at the intersection of public engagement and policy dialogue, fostering exchange among diverse stakeholders, an approach that responds to the observation that most climate simulation games are typically designed for either public or policy audiences, but rarely engage both simultaneously (Vervoort et al. 2022).

6.1 | Workshop *up:town*

up:town, a serious game developed by the City Science Lab at HafenCity University Hamburg, simulates a fictional city under socio-ecological stress. Players adopt distinct roles, such as planners (with a focus on, e.g., sustainability, compliance, economy) or citizens (e.g., kindergarten teacher, mobility-impaired over 80-year-old; activist) and negotiate responses to unfolding challenges ranging from infrastructural failure and natural disasters to displacement in specific districts, like informal settlements, financial districts or middle-class suburbs. In a first step, participants discuss possible solutions within their peer groups of planners and citizens (e.g., planners of a district marked by low-income neighbourhoods) and subsequently with the corresponding group (e.g., the citizens of the low-income neighbourhood). Having decided on a solution collectively, they start building their model with Lego bricks and play dough and present their solutions in the plenum. As such, *up:town* functions as a creative mapping tool, not in the traditional cartographic sense, but as a space for relational and speculative engagement with urban futures (Candy and Dunagan 2017).

The Jakarta game rounds were initiated by Rujak's management, who had encountered the framework in an *up:town* session during the *Sinking Cities* urban experiment in Alexandria. The game was adapted to address North Jakarta's environmental challenges, institutional structures and socio-political tensions. After collaborative debate on adaptation scenarios, Rujak received the full template set and adapted it to the local context. They developed seven new citizen personas (e.g., man, mid-40s, teaches children's religious class), two planner personas (e.g., land-agency officer suspected of collusion with major developers), two neighbourhoods (e.g., a dense urban kampung of narrow alleyways and tightly packed homes), and two event cards (earthquake leading to urban fire; volcanic eruption leading to tsunami). The complete deck was typeset and printed in both Indonesian-only and Indonesian-English editions (Figure 11).

Local NGO facilitators were engaged to co-run two game sessions in February 2025. An online briefing outlined the framework and assigned facilitator/translator roles, and a full trial was conducted at Rujak's office in Jakarta ahead of the sessions. Initially, two mixed sessions (residents and officials) were planned to support perspective-taking. Based on the NGO's experience that residents speak more freely in dedicated settings, two separate groups were subsequently organised to create a safe space: one for professionals (local government representatives, academics, kampung organisation leaders) and one for the public (kampung residents, local community members, museum visitors) (Figures 12 and 13).

6.2 | Playing *up:town*: Between Local Relevance and Speculative Imagination

Around 20 participants attended the afternoon public session at Bahari Maritime Museum. After the German moderators welcomed and introduced participants to the context and the game (this input was translated by local facilitators), participants were divided into two groups of ten, which both played a locally specific scenario. In the first fictitious scenario, taken here as an example, 'Kampung Kota' is threatened by a volcanic eruption that is likely to trigger a tsunami. 'Cultural Heritage' was introduced as a bonus card in the game design, prompting players to strategically mobilise collective memory, identity and local knowledge systems in shaping more resilient urban trajectories. For this group, 'cultural heritage' took the form of a floating city that can at times levitate through

FIGURE 11 | Introducing up:town—a playful approach for collaborative futuring. Berger/Kühn.

FIGURE 12 | *up:town* played with residents of Kampung Akuarium (All participants were informed that *up:town* was part of an academic research project and would be included in related publications. They gave their verbal consent to participate and to the use of the findings. Nevertheless, we have chosen to anonymise all participants in this article to protect their privacy). Berger/Kühn.

spiritual connections. After the second event card—'Refugee Crisis', which required the residents of a neighbouring town to find shelter—was introduced, the groups debated how they would respond. After presenting their solutions, both groups held a facilitated plenary to discuss their gaming experiences and serious gaming's potential.

While the atmosphere in the public session was enthusiastic and creative, leading to a deep discussion of eviction experiences and moments of empowerment, the professionals' session proceeded more slowly. As playful sessions with government officials and other professionals are less common, we devote in our analysis greater space to the latter,

FIGURE 13 | *up:town* played with local government officials in Jakarta (All participants were informed that *up:town* was part of an academic research project and would be included in related publications. They gave their verbal consent to participate and to the use of the findings. Nevertheless, we have chosen to anonymise all participants in this article to protect their privacy). Berger/Kühn.

acknowledging that this emphasis may bias the account of the workshop as a whole. Eleven professionals (including six in uniform) were welcomed to the workshop by the two moderators from Germany as well as four trained local facilitators and interpreters. The planned pre-session briefing for the German moderators (e.g., participant list, role assignments, professional culture specifics) did not occur due to unforeseen availability constraints. After introducing themselves, their background and the project, the moderators explained the game mechanics. The whole introduction was translated from English into Indonesian.

Within the professionals' session, only one setting was played—Kampung Kota with the event card 'Heavy Rain', causing water to rise rapidly and forcing the inhabitants to act immediately. The group was split into planners and citizens, after which they began discussing possible solutions, quickly culminating in an eviction scenario. A second event card, 'Refugee Crisis', was played to disrupt what had been a seemingly smooth process. In response, the group made moderate concessions regarding the supply of goods, information and temporary housing options to 'give the people their peace of mind', as one participant explained. Allowing players to determine what 'cultural heritage' meant for them, the group designated the mosque as central to community resilience.

The contributions were clearly structured and drew on the professionals' real-life experiences. The negotiation process was skillfully managed: it was highly organised, with speeches ordered and timed according to the official ranks of the participants. This was especially delicate, as the session brought together a member of the evicted Kampung Akuarium community and several officials from local agencies responsible for the eviction planning. Although the member of the Kampung and the (all-female) academic staff were invited to voice their views, the decision-making was dominated by a small group of senior male participants. All of the facilitators—later interviewed by the research team—described the atmosphere as serious and, at times, tentative. While a number of lower-ranked participants were eager and playful, they proceeded with noticeable caution.

The German moderators also experienced the atmosphere as tense, although they were unable to follow the discussions, which were unexpectedly conducted in Indonesian to meet some participants' needs. As a consequence, they could only intervene or steer the discussion by asking the local facilitators to translate questions, prompts and other input. The dynamics shifted slightly when an experienced facilitator engaged participants with creative Lego and play-dough activities, which helped to create a lighter tone. A short debrief after the session gave participants the opportunity to provide feedback—ranging from 'too close to our daily business' to 'interesting methods that could be used in our local projects'. Moderators contextualised the method within an academic framework of serious gaming and described their take on creative approaches.

6.3 | Speculative Futuring and the Limits of the Method

In imaginative, game-based research settings, assigning roles functions as a key epistemic mechanism by enabling participants to reframe real-life experiences and explore alternative perspectives. Gaming can empower less influential actors by

allowing them to inhabit powerful roles, facilitating a temporary reclaiming of agency. Simultaneously, it creates a productive estrangement from everyday knowledge, encouraging speculative thinking and valuing local, non-expert insights. While this estrangement and the mechanics of changing roles allowed residents with eviction experiences to re-live them from a position of power and agency, the refugee crisis surprised them. As such, it created productive tensions within the group, leading to a more lively and playful atmosphere. This interplay between empowerment and levels of estrangement challenges conventional hierarchies of knowledge and fosters new forms of understanding, imagination and bonding.

Despite its potential, role-taking in game-based research settings often encounters friction due to conflicting expectations between professional, everyday and speculative roles. The high degree of localisation through scenarios such as flooding, volcanic disruptions and tsunamis, as well as references to locally specific districts such as kampungs and middle-class high-rise buildings, was intended to make the scenario accessible and relevant. However, in the session attended by professionals, the content seemed to be too close to their lived realities. This closeness limited the abstraction necessary for speculative play. Participants tended to reproduce familiar dynamics rather than disrupt them and often reverted to technocratic planning scripts. This convergence around expected roles highlights a central methodological feature: the more closely a speculative tool mirrors reality, the less room it leaves for imagining alternatives (Frissen et al. 2013; Oomen et al. 2022); and the less knowledge participants have prior to the gaming, the greater seems to be the detectable impact of the role-play (Rumore et al. 2016).

Power asymmetries, though partially softened through the game environment, remained deeply embedded in participants' interactions. Separating residents and local government officials, while intended to create safer spaces for engagement, produced different outcomes. Among the kampung residents, the social cohesion led to enthusiastic and joyful discussions that culminated in self-organised debate at the end of the session. Within the officials' group, most government officials attended in uniform, reaffirming their actual professional role and all participants were well-informed about urban development processes and represented hierarchically structured organisations in which each holds a defined role and position—a setting which complicated playful and speculative engagement. While gaming was intended to create spaces for reflexive learning, dialogue and moments of talking while doing (Flood et al. 2018), participants largely adhered to hierarchical structures familiar due to their shared background.

These very different experiences underscore the risks of assuming that participatory tools can be seamlessly transplanted across contexts (Kesby 2005). It highlights the necessity of approaching knowledge production, translation and localisation as situated, contested and deeply political processes. In the case of *up:town*, it was features of organisational and institutional culture, which allowed similar gaming mechanics to create totally different dynamics. Legitimising gaming in professional settings, amid power dynamics and a fragile speculative frame, requires methodological sensitivity and attunement to the epistemic politics of place-making, translation and participation. In hindsight, following joint reflection with the facilitators, the NGO partner and the research team, we would redesign the workshop as a more integrated process, inspired by the community-led approaches described by Blackett et al. (2022)—which might have helped balance diverse knowledge systems more equitably. As others have argued, climate change is not only a material crisis, but also a crisis of the imagination, of whose futures are rendered thinkable, livable and legitimate (Gabrys and Yusoff 2012). As such, the game revealed not only the potential but also the fragility of workshop settings when deployed in politically charged, real-world settings (Caretta and Vacchelli 2015).

Above all, alongside resident safety, a safe forum for professionals should have been provided. Something which is often pointed out as obligatory for serious games to function (Flood et al. 2018), yet can be challenging: In this case, the aim would have been to insulate contributions from agency liability and prevailing power dynamics. In addition, closer cooperation with government actors to avoid 'participation by mandate' and early preparation, scheduling more comprehensive advance briefings, introductions, discussion of divergent organisational and institutional cultures and expectations, and early agreement on the working language. Responsible transfer of the game to various contexts entails integrating situated knowledge (Haraway 1988): it must be close enough to matter, but distant enough to unsettle. If balanced successfully, the game remains generative across contexts and participation not only becomes a practice of imagining futures, but also of interrogating the conditions under which imagination itself becomes possible.

One way to enable the development of situated concepts is to invite independent development through local actors using open-source ideas, tools and material: post-sessions, the creators left a full card set and associated creative materials with the NGO to enable reuse. Since then, the format has not remained static: artist Haratua Zosran adapted the game to co-develop a climate change module for youth activists together with a local NGO. In addition, Rujak plans to use a set at a festival in Jakarta and a local urban planner, engaged as a volunteer in the *up:town sessions*, has adapted the game for her professional practice. Her artistically designed persona cards are now being reintegrated into the original German set. Another volunteer, now a teacher in Bali, uses the game to introduce political and planning scenarios to her students. The format thus travels and is being locally adapted to context-specific needs. This reflects a collaborative approach to urban experiments in which knowledge is co-produced, cultural frictions are addressed rather than elided, and lessons become portable insofar as they are adapted to place-specific institutional and socio-political conditions. In this sense, trans local exchange is oriented less toward replication than toward careful translation under the guidance of local actors.

7 | Mapping Otherwise: The Potential and Limits of Play in Climate Adaptation

Drawing on the empirical insights from the two case studies, this section discusses the contribution of playful mapping

approaches to the incorporation of cultural and social values of marginalised groups into adaptation strategies. This also considers the use of the term *cultural heritage* as a conceptual entry point and the integration of insights from such formats into long-term adaptation planning.

7.1 | Mapping Cultural and Social Values

Social and cultural values that people attach to places include a variety of values such as spiritual, aesthetic, recreational or economic ones. The overarching purpose of mapping them is to allow a better understanding of the relationships between people and their natural and built environments (Novaczek et al. 2011). In the context of climate adaptation, this is significant because cultural and social values contribute to shaping resilience, while certain adaptation measures may simultaneously put them at risk. To date, there are only a few approaches that seek to map cultural and social values in the context of climate adaptation. Those that are largely based on conventional methods of social research are typically aimed at producing data to support governmental decision-making (e.g., Graham et al. 2014; Novaczek et al. 2011; Ramm et al. 2017). In contrast, the benefits of playful methods in climate adaptation are typically located in the fields of education and public engagement (e.g., Fischer et al. 2024; Orlove et al. 2024; da Silva and Valdes 2023). The two playful approaches discussed above combine elements of data collection, education and public engagement, with the *up:town* game additionally incorporating aspects of policy advice.

The workshop *Our Coastal Neighbourhood* aimed, on the one hand, to support children in experiencing themselves as autonomous and capable individuals in a rapidly changing environment. While the methods applied may have contributed to this goal, achieving a lasting and measurable educational impact would likely require a series of sessions conducted over a longer period. The second aim of the workshop was to gather information on children's perspectives—data that are rarely captured through conventional social science approaches to mapping social and cultural values (e.g., Brown 2008; Graham et al. 2014; Novaczek et al. 2011). The resulting maps and other data on children's cultural and social values proved to contain valuable information. However, to incorporate these insights into adaptation planning, the workshop outcomes would need to be further analysed, translated into other formats and complemented by additional data.

The playful approach of the *up:town* workshop offered an opportunity to initiate a conversation on cultural and social values with government officials and local residents. Designed to prompt discussion—not to produce robust value data—this activity cannot substitute for systematic mapping (e.g., Novaczek et al. 2011) and does not on its own support the long-term implementation of playful approaches (e.g., Fernández Galeote et al. 2021; Hügel and Davies 2024). Rather, both approaches might serve as additions for incorporating social and cultural values into adaptation planning, as *up:town* can act as a door-opener for conversations between very different groups, while *Our Coastal Neighbourhood* captures children's lived realities and experiences and provides them with a space to engage with them.

In summary, combining playful approaches with data collection and policy advice holds promise for informing stakeholders about relevant cultural and social values in adaptation processes. However, the data generated in this way will usually require further processing to make it usable for planners and policymakers—and may still not be applicable in some cases.

7.2 | Cultural Heritage as 'Floating Signifier'

While having slightly different goals, both approaches used the term *cultural heritage* instead of cultural and social values (or a list of specific values). This approach was motivated by the aim to highlight values regarded as especially significant by the community and worthy of preservation for future generations. In the *up:town* workshop, this name was assigned to the corresponding bonus card, and in the preparatory interviews for the *Our Coastal Neighbourhood* workshop with adults, as well as in the workshop itself with children and adolescents, questions about cultural heritage were asked. However, no definition was established; rather, it was understood as a floating signifier (Laclau 2007) to capture what the participants consider as their heritage. Floating signifiers are articulated differently depending on the discursive contexts, which opens up possibilities for their use in social research as they can help to stimulate discussions and examine different perspectives on complex topics (Moraes 2014). As Hofferberth (2015) remarks, it is still important to discuss floating signifiers in a cautious and self-reflective fashion to do justice to their ambiguity.

One central insight from both formats is the divergence between official, state-recognised heritage (such as the Dutch colonial buildings) and the informal, everyday cultural practices valued and remembered by adult interview partners and the young workshop participants. Both, interview partners and children, linked cultural heritage solely to cultural practices or to memories of lived experience and sites whose access often has been restricted through the construction of protective infrastructure and displacement. Similar to their associations, residents' stories, told during the *up:town* workshop, reveal an understanding of heritage that is closely tied to relational, spiritual and informal practices. The 'Cultural Heritage' bonus card in the *up:town* game elicited contributions about religious rituals, seasonal celebrations and everyday communal practices, and participants engaged in lively discussion on these subjects. Rather than simply representing symbolic traditions, these forms of informal heritage often operated as flexible adaptive mechanisms within a broader repertoire of community-based competences contributing to resilience. Practices such as joint preparation for ceremonies or the strategic use of myths to save children from risks such as drowning illustrate how cultural practices are adapted to shifting conditions in ways that sustain communal cohesion and behavioural norms. As Rahmayati et al. (2017) argue, such heritage can actively strengthen social cohesion and shape a community's adaptive capacity.

Methodologically, using the broad label *cultural heritage* rather than a list of specific cultural and social values proved fruitful. It not only sparked lively discussion but also allowed

participants to articulate forms of cultural and social value that we, as researchers, had not anticipated. The strength of the term lies not in analytical precision but in its ability to resonate with very different groups in society, making it a useful entry point for participatory discussions of cultural and social values.

7.3 | The Redistribution and Reproduction of Power

Both mapping exercises also engage with broader representational tensions in Jakarta's planning discourse. As previous research notes, kampungs are frequently depicted in policy and media narratives as backward, informal or obstructive to modernisation (Dovey et al. 2019; Leitner and Sheppard 2018). These dominant imaginaries shape both the literal and symbolic erasure of kampungs from urban plans. Against this backdrop, *Our Coastal Neighbourhood* and the *up:town* game operated as counter-narratives (kollektiv orangotango+ et al. 2018). They inserted stories, roles and identities that resist such erasures. Yet, while both use cases surface alternative perspectives, they do not inherently redistribute power. As engaging in a participatory format does not guarantee influence on real planning decisions (Hofer and Kaufmann 2023), both mapping methods remained confined to the workshop setting despite their critical potential. Integrating the cultural and social values of kampung residents into adaptation planning is challenging, as it requires linking marginalised perspectives to long-term structural transformation. Scaling these approaches is further complicated by their resource-intensive and context-specific nature, and their influence on broader policy frameworks hinges on alignment with existing governance structures.

Finally, creative methods risk being perceived as frivolous or symbolic if they are not linked to actionable outcomes. Some participants voiced this concern, questioning whether their contributions would be taken forward beyond the research setting. As these use cases were designed as an experiential and cross-sectional snapshot, they do not allow for analysis of longer-term impact or spillover effects. Future research might explore whether and how such creative processes influence planning discourses, decision-making or community organising.

In addition, playful approaches do not guarantee representational justice. In the *up:town* session with professionals, power asymmetries among heterogenous official ranks and positions shaped the tenor and outcome of the engagement. While the separation into different groups ensured a sense of comfort for participants, it also limited the opportunity for professionals to enjoy a safe space as well as a direct dialogue between citizens and state actors—a process the simulation game *up:town* was intentionally designed for. The relative homogeneity of the professionals' group may have constrained their imaginative scope, with outcomes falling short of the game's transformative potential.

These limitations invite careful reflection on positionality and facilitation, and on the ethical dimensions of asking communities to invest in creative processes without a clear pathway to impact. While playful approaches may democratise knowledge production to some extent (Frissen et al. 2013), they also demand accountability from those who implement and document them. Every use of playful methods should be preceded by a careful assessment of their resource requirements and potential risks—such as negatively affecting social or institutional relationships—to make an informed and context-sensitive decision about whether their implementation is justified.

8 | Conclusion

The disconnection of residents from their familiar environments reflects a broader shift in the cultural landscape of kampungs, where access to the sea has been restricted through redevelopment, protective infrastructure and displacement. Playful mapping offered a way to make such disconnections visible by giving residents the tools to document their own spatial narratives. Aiming to (re)claim cartography as a means of situated storytelling and collective agency (Caquard and Cartwright 2014), they tried to generate spaces for articulating and negotiating one's relationship with the environment and creating alternative imaginaries of life along the waterfront, which has been partially successful. While challenging technocratic tools of mapping, the workshops also showed that playful forms of mapping cannot counter the actual reality of spatial planning. They can document and provoke reflection, but re-establishing access to space requires broader structural change. Without explicitly linking the workshop findings to institutional responsiveness, such mapping approaches risk becoming archives of ideas and memories rather than tools of renewal.

This raises broader questions of epistemic justice: What would change if the cultural and social values of an informal urban community were more visible in planning? Or if their perceived cultural heritage were formally acknowledged as such? Could this lead to new forms of support, visibility or protection? As the findings suggest, playful methods have the potential to do more than gather data. They can help to reflect critically on social and cultural values and gesture toward more inclusive, responsive adaptation planning and design strategies. However, for playful mapping to unfold its transformative potential, the intention to translate local experiences and needs into the political realm of planning must be embedded in the very mechanics of the method. Without such structural design, the contributions risk remaining isolated expressions rather than becoming integrated into longer-term, institutionalised change.

Looking ahead, the development of modular formats that bring diverse stakeholder groups, kampung residents, government actors and civil-society organisations into converging processes will be an important step. Multi-stakeholder approaches of this kind promise to raise the political and procedural relevance of playful methods. It may, in fact, be the friction between different actors that generates the imaginative energy needed to develop new ideas. One-off workshops can spark insight, but sustained impact requires stable partnerships and a continuous commitment to co-learning across disciplinary and cultural contexts. As these methods are adopted in other settings throughout Jakarta (and Bali), future work could follow their travelling and development under situated yet heterogeneous circumstances,

assembling a longitudinal case that evidences institutional, social and spatial outcomes of playful mapping across extended periods.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Endnotes

[1] The analysis was inspired by their distinction between actors, arenas and aims; for an overview, see app.1.

[2] A consent form was read aloud to the participants' guardians/parents. The NGO had advised against requiring written consent, as this could have placed families in an uncomfortable position: Due to a strong trust-based relationship with Rujak, requesting written consent risked undermining that trust and making participants feel scrutinised. Given the history of eviction, signing documents carries negative connotations in this community. Therefore, the artist relied on verbal and community consent, engaging local leaders such as the cooperative head and head of neighbourhood association.

[3] 'Warisan' is used interchangeably for both 'cultural' and 'historical' in the Indonesian education system (in schools), specifically as something 'being passed down'. Participants were engaged in a discussion about individual and collective usage of the notion before the photovoice session.

[4] The method is mainly used in research on topics related to health and disability and the participants are adults who receive monetary and nonmonetary incentives (Hergenrather et al. 2009).

[5] Pesugihan refers to practices aimed at acquiring wealth through supernatural means. At Kampung Akuarium, there are rumours that children were deliberately drowned as a sacrifice for a jinn. In an interview, one of the adults explained that these children had been unable to swim.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendix S1:** Playful mapping for climate adaptation (Kühn et al.): Summary of systematic analysis of workshops based on Hofer and Kaufmann 2022.