

# Jakarta: Design Research and Hypercomplexity

“On the issue of climate change, it is difficult to imagine how the poor would come together behind that idea when they need to think about their survival the next day. Climate change may become a rallying point for the urban poor if an understanding is formed between the middle class and the government that *banjir* (flood), for instance, and potentially larger catastrophes, are issues of justice (not only issues of engineering), and thus inseparable from global injustice.” Abidin Kusno<sup>1</sup>

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## ARCHITECTURE+ADAPTATION

The **Inundation: Jakarta** studio series, initiated in 2012, resulted from a hunch shared by three faculty researchers at different institutions that the global sites of ecologically at-risk urbanisms constitute a geography that largely falls outside the typical domain of architectural education, especially in the West. Cities that have a disproportionate exposure to the accelerating effects of climate change—predominately coastal or deltaic regions in developing economies—are too often underrepresented in design schools even as debates around anthropogenic climate change have gained attention. Some of the most populous and quickly urbanizing areas in the world—Mumbai, Manila, Ho Chi Minh City, Bangkok and Jakarta, among others—are experiencing a rise in devastating inundations as well what has become accepted as “routine” flooding. In order to investigate the intersections among extreme environmental circumstances, urban poverty, and architecture practice and production, these faculty formed the **Architecture + Adaptation** research initiative as a collaborative research and teaching platform. With a primary concern for the spatial politics of water, we identified Jakarta as an initial site for addressing the environmental challenges of anthropogenic climate change and its attendant social effects.

Through an interdisciplinary and intercultural exchange, **Architecture + Adaptation** created the **Inundation: Jakarta** workshops series to develop hybrid modes of research to produce an image of the complex urban and social assemblages. Recognizing the disparity between the limited knowledge we arrived with and the scenarios we were attempting to understand on the ground, the studio pedagogy positioned “unknowing” as a condition for careful inquiry, whereby design becomes a tool for inquiry rather than a direct path toward a solution.<sup>2</sup>



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### JAKARTA UTARA

As a gateway to the resource-rich archipelago of Indonesia, which became an independent republic as recently as 1945, Jakarta is a city shaped by decades of colonial rule and foreign trade. Geographically, the city occupies a broad river basin where a dozen rivers originating in the highlands to the south flow northward into the Java Bay. The original paths of these rivers are untraceable in today's Jakarta, where perhaps the most prevalent of Dutch legacies is an aging network of canals, embankments, reservoirs, and floodgates. Constructed to dry out a growing trade hub and regulate the seasonal floods due to swelling rivers and ocean tides, this colonial infrastructure still forms the backbone of Jakarta's flood mitigation strategies. However, the circumstances of its service area have changed dramatically since the days of Dutch Batavia.

Covering more than 650 km<sup>2</sup> and populated by over 10 million residents, the capital city of Jakarta is a sprawling – and rapidly changing – megacity. Accounting for the larger metropolitan conurbation of Jabodetabek, the numbers jump to over 6300 km<sup>2</sup> of land area and more than 28 million residents.<sup>3</sup> The signs of this urban intensification include Jakarta's famously congested roadways and a skyline filled with construction cranes, as countless megablock developments replace large swaths of the urban fabric. Even so, Jakarta's image as a "world city"<sup>4</sup> is incomplete and only partially recognized, mostly in terms of a site of economic opportunity and the propagation of neoliberalist agendas.

In 2005, for instance, the investments firm Goldman Sachs designated Indonesia one of the Next Eleven (N-11), a group of so-called developing countries that showed promising signs of increasing their market size and investment potential.<sup>5</sup> These designations should be understood as an extension of the neoliberal project into (largely) postcolonial cities in Southeast Asia and the global south. At its core, neoliberalism conceives of the city as a vehicle for international speculation and profit through the creation of infrastructure and the expansion of property markets.

Figure 1: Flooding as everyday experience; North Jakarta, 29 May 2012.

Neoliberalism continues to shape Jakarta's growth through its water infrastructure in two fundamental ways: as an investment opportunity, and as a disaster-management scheme. International financial institutions such as the World Bank and the Asia Development Bank play key roles in boosting investor confidence in these emerging economies by investing in them. Urban water distribution in Jakarta facilitates the presence of international water corporations such as Suez Lyonnaise des Eaux, one of the largest multi-utility, multinational companies in the world.<sup>6</sup> Awarded the contract to supply half the city's utility water (piped water is not potable; drinking water is supplied via bottle distributors) in the 1990s, this French operation, managed by the local company PAM Jaya, failed to substantially increase the service coverage from 41% city coverage at the time of the agreement<sup>7</sup>, leading to many restructurings of the arrangement. In short, the model of private-public partnerships in Jakarta has fallen short of correcting the uneven distribution of service throughout the city, much less providing for the growing needs of its populace.

Meanwhile, flooding and inundation create a continuous nuisance to the efficient functioning of the city. The halting of the city by flooding and the attendant degradation of its infrastructure create the conditions for what Naomi Klein has described as "disaster capitalism," whereby failure itself becomes profitable through the transnational outsourcing of restoration projects to multi-national companies.<sup>8</sup> This confronts competing interests that make infrastructure expansion and efficiency a profitable enterprise. These two contradictory forces may interrelate in the profitable production of failure itself, a repeating cycle of building for failure and obsolescence through decay.

The expansion of this disaster economy and the self-conscious imaging of a new global city have significant consequences for the city's lowest-income residents by pressurizing the competition for housing, employment, as well as clean water and food. In Muara Baru, a thriving urban settlement, or *kampung*, in North Jakarta, residents are facing an extreme case of the conflict between global-imagining, flood mitigation, and their livelihoods. As the primary housing for low-income residents, *kampungs* appear throughout the urban limits of Jakarta as settlements of housing with an integral density of economic activity, all built upon government land. In the *kampung*, residents acquire homes or sites to build homes through an extra-governmental system of payments and negotiations, and as a solution to housing the poor, the government allows "temporary" residency on this land, but reserves the right to revoke this tacit agreement. The unprotected status of land tenure in the *kampung* has enabled the city government to recently declare that the entire neighborhood of Muara Baru, an area adjacent to Waduk Pluit (a run-off retention reservoir), must be evacuated and the residents relocated elsewhere.

These global-economic aspirations and local government misbehaviors operate along multiple spatial and temporal registers, but all form an important context for the research conducted by the interdisciplinary team assembled under the Inundation workshops in 2012 and 2013. While much more can be said about Jakarta's precarious water politics and the troubling trajectory signaled by current mega-developments, this essay focuses primarily on questions of design pedagogy and the exigencies of situated design research within architecture education.

## INUNDATION

In January 2013, the city braced itself for a major flood, with meteorologists and hydrological engineers predicting heavy rains would overcome rivers and canals, while along the coast the full moon tides would swell against the sea walls and drainage outlets. This highly anticipated convergence prompted the new governor to take unusual measures, and he directed a national agency to plant salt-bombs in the coming rainclouds to divert the rain. The extremity of this public performance reflected the rising pitch of anxiety around banjir (flood) as well as the watchfulness Jakarta's citizens aimed at the city management.

While the predicted heavy rains never came, a host of less considered factors led to the city infrastructure to become overburdened with water from all directions. On January 17, 2013, the amount of water entering the Waduk Pluit was over twice its capacity, and the pumps, which bring the water up to the level of the sea, which at mean sea level is higher than that of the nearby canals, could not keep up. But rather than simply labeling the pump house as the site of failure, to understand the complex nature of inundation requires expanding our investigation beyond purely infrastructural factors to consider the compound social and political dimensions of this escalating problem. From the stress point at the Pluit pumps, tracing the water flow back through the city would implicate the impervious surfaces of the city's extensive footprint, the accumulated trash of millions that clogs the canals and floodgates, the opaque operations of these floodgates at the various intersections and pressure points of these waterways, and, even farther up, the deforestation and urbanization to the south, causing lower absorption rates of run-off.

While inundation is typical in the north, this time the water so persistently inundated other parts of the city that it forced the experience of banjir across a larger spatial territory and broader social range, from the north all the way down to the more affluent southern and eastern edges of the city. This new territory of experience suddenly made the water politics of Jakarta, by way of a vast and continued inundation, sensible. This re-distribution of the sensible, then, connected the reality of banjir to the urban poor as well as the middle and professional classes, challenging the modes of inhabitation and settlement across classes and income levels. Taking the political opportunity to respond to this sentiment, the Governor himself scripted a narrative of blame, attributing the cause of the catastrophe to a 21,000 km<sup>2</sup> strip of land on the west side of the Waduk Pluit reservoir, occupied by around 640 families as well as about half that population in a slightly newer settlement along the reservoir's the east side. In the aftermath of the flood, the governor's office hastened to translate this blame narrative into actions. As a highly visible component within the governor's larger campaign to resolve the problems contributing to the recent inundation, his plan was not met without resistance, and the Urban Poor Consortium (UPC), an advocacy group for low-income and underrepresented residents quickly organized the community to demand the protection of their homes and livelihoods.

Here, at the intersection of political ingratiating and disaster capitalism, we begin to understand how entangled patterns of weather and climate variations are with the realms of human action and political will. Ecological management is not just a technical problem, but one that requires synthetic methods of addressing the non-human and human agents at work within this "post-natural" composition. As an important term guiding our research since the



Figure 2: Location of Muara Baru adjacent to Waduk Pluit (flood mitigation reservoir) in North Jakarta. The governor plans to evict all residents within the zone and relocate them to adjacent plots as well as to areas on the urban periphery.



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Figure 3: Dredging the Waduk Pluit. Beyond the reservoir is the Muara Baru kampung and farther in the background are the signs of rapid development in North Jakarta.

inception of Architecture + Adaptation, the term “postnatural,” refers to systems and processes which could occur without the intervention or influence of human actors (i.e. naturally), but which no longer do so. This allowed us to understand that design cannot be driven by technical solutions, and that the water in the city, both as a utility and as banjir, leads a complex, hybrid, material-cultural life. Understanding and articulating the relations among these material-cultural assemblages is necessary for design interventions to have any meaningful effect. Thus, developing hybrid research methods that could account for the quantitative and qualitative values distributed across this contended territory was a fundamental challenge for the Inundation 02 research. UPC asked us to contribute to their advocacy efforts by gathering information that would describe the community’s crucial ties to that site as well as the interrelations that inform the residents’ day-to-day livelihoods.

### WADUK PLUIT and Muara Baru

Upon our arrival in Jakarta in early June 2013, the west side of the Pluit reservoir, had already been razed, while residents of the east side remained locked in a complicated negotiation with government officials over the quality and location of their new housing assignments, (at least those entitled to relocation; many residents are not “card-carrying” citizens of Jakarta, and thus have zero claims to the replacement housing). We observed dredging floats carrying debris out of the reservoir, and construction crews building a new urban park where the *kampung* had been leveled. While the fate of Muara Baru was being negotiated, its likely future was being paved across the reservoir where an access road has been built and lit by some nostalgic faux-iron street lamps. The new waterfront park, a more amenable neighbor to the proposed real estate schemes in the area, represents the promise of a newer, cleaner city, a process reminiscent of the European campaigns to sanitize the tropical city through infrastructural and managerial interventions within the landscape. According to urbanist Abidin Kusno, the “greening” of Indonesia’s capital has been taken up as a new strategy of governance, granting authority to the state to enter into partnerships with developers and builders to promote projects that claim to deliver some amount of environmental improvement (public space, water management, trees). This brazen set of actions taken against an entire community within the city is further justified in the eyes of the middle- and upper-class citizens of Jakarta through the rhetoric of “greening” the city.

### ASSEMBLING URBAN HYPERCOMPLEXITY/ Methodology

Against this narrow formulation of sustainability through development, one of the objectives of the studio research was to demonstrate how the dense internal network of social relations within the *kampung* compensates for limited access to resources, while also identifying moments where design could have a helpful impact. And while there were ongoing efforts from a community architecture group (ARKCOM) to work with the Muara Baru community on proposals for the relocation housing, and we discussed these schemes with them, ours was a less explicitly architectural approach to engaging this scenario. Rather than assume we could generate spatial solutions, our task was a matter spatial information. The need for a better picture of this community was explained by Edi Saidi, UPC coordinator:

We met with Governor Jokowi at the beginning of February 2013. How about if the residents continue to live there? They could if we went through a process



of village planning with all the data first: How many people are there? Why don't they want to move to a rental? What is the reason? What is their income? How far is it from their work to their home now? All that data is needed to measure and identify their connection to this area and their employment. According to us, the village at the edge of the reservoir shouldn't be seen as a problem, but as potential, potential that, if upset, will be lost.

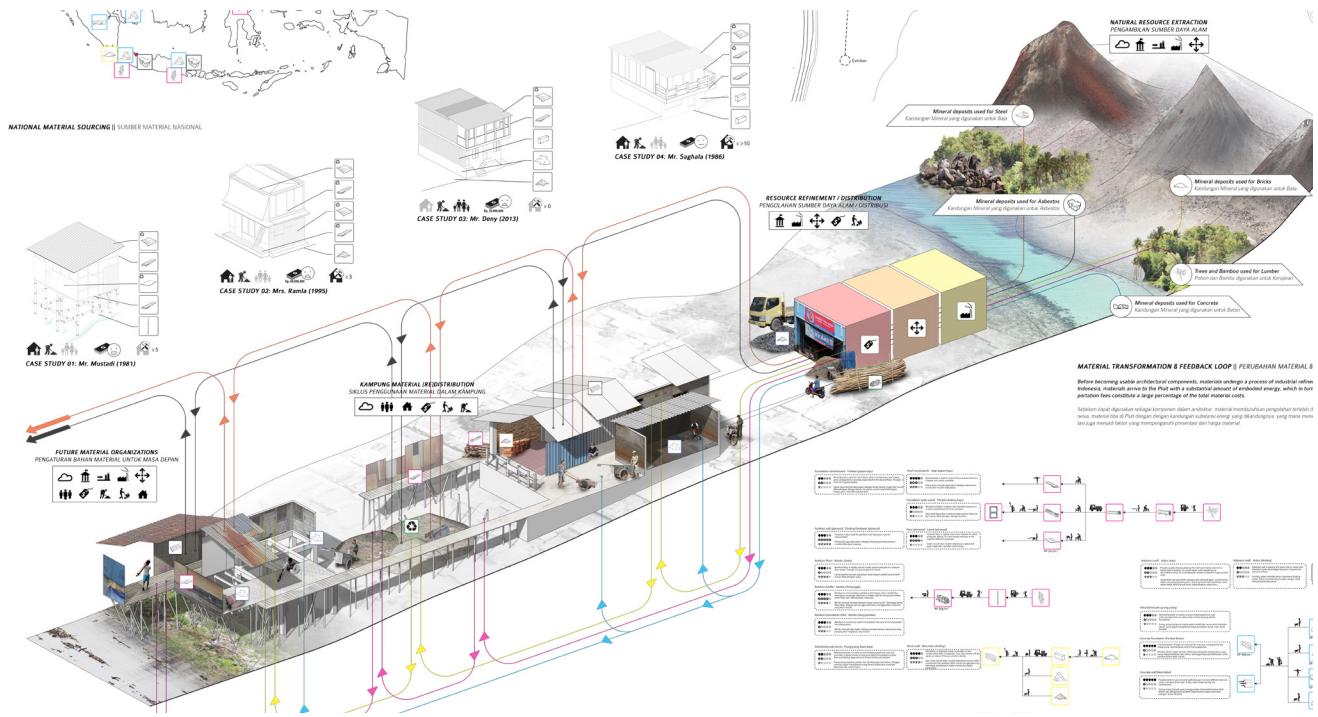
Not only were we outsiders to this physical and cultural landscape, but these research objectives put pressure on the typical way a studio pedagogy would approach site research. The workshop methodology thus positioned architecture practice as a means of navigating within an unknowable set of circumstances and locating scenarios for a course of intervention. As an alternative to the large-scale plans frequently handed down from the top, the approach to gathering information in Muara Baru considered the spatial narratives, social interactions, and urban experiences where they are located—on the ground. The students in the workshop formed 6 teams that each investigated a particular resource flow into, within, and beyond this neighborhood: Electrical Services, Drinking Water Distribution, Floodwater Management, Food Distribution, Materials and Construction Practices, and Waste Streams. Through interviews, site observation, and data collection, these six investigations represented the kampung as a thick ecology of flows and dependencies, which connect the kampung enclave to larger networks of movements and exchange in the city. Even the more affluent neighborhoods nearby benefit from and even rely on the proximate resource of social and economic activity. Working with UPC, our efforts were directed toward a representation of that community as a non-negligible component of the city's daily life (our refrain being Muara Baru is Jakarta); and as a design pedagogy, the value of this research really lies in retooling our approach to site research.

By analyzing typically unseen relationships and speculating on how architecture could complement the agency within these assemblages, the following design research exercises reposition the various stakeholders, objects, and spaces where they interact toward more adaptable forms of architecture and urbanism. They suggest ways architecture practice can participate in interdisciplinary research and advocacy around water politics in Jakarta and beyond.

### **Urban Assemblage Drawing**

As architects, observation is an active practice, closely linked to visual representation. Throughout our fieldwork in North Jakarta, students produced various visual artifacts (maps, drawings, diagrams, photographs) as tools for documentation and analysis. But the nature of our research topic and the "sites" of inundation are in themselves resistant to fixed representations, such that our work necessitated new methods of recording and classifying our observations. This aspect of the work is not simply a creative exercise but an important means to remaining open to new arenas of architectural concern that do not fit easily within conventions of drawing and other familiar forms of spatial representation.

The Urban Assemblage Drawing assignment asked that students collaboratively create a synthetic drawing with the informants/actors from Muara Baru as their main protagonists. The drawing was considered a complete repository of the team's research and a territorial representation of the social, institutional, and material relations that shape the systemic operations of each group's resource



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Figure 4: Materials and Construction Practices: Urban Assemblage Drawing. Student Team: Minhee Choi (UM), Penelope Fung (HKU), Wyan Jatasya (UI), Eric Meyer (UM), Fazrin Rahman (UI), and Nerissa Yeung (HKU)

flow. The assignment did not specify a particular drawing convention, but allowed the students to incorporate multiple projections, including plan, section/ elevation and diagrammatic elements. Social relations were represented as spatial and material, with each drawing representing multiple connected scales and different times. One objective of this assignment was for students to not only pay attention to materials as they transform under different pressures and take new forms as they move, but to represent these transformations visually, without generalizations or reductive linework where connections or dependencies are in actuality highly nuanced. The primary goal of assemblage analysis, however, was to provide a more robust account of relationships between different types of actors, and their capacities to act and be acted upon.

Pedagogically, the assignment was staged to help students come to value drawings not just as visual artifacts or conclusions to a conceptual process, but as an important tool for “seeing.” In this case drawing are a means of “seeing” the circumstances of inundation that could only be produced from an architectural standpoint.

### Prototype for an Information Gathering Tool

Students cannot learn about the potential agency of architecture from studio course work or lecture theaters alone. The impact of field research, on the ground collaborations, site-based and intensive analysis, and first hand site investigations cannot be overstated for the improvement of student learning. While architecture has recently witnessed the emergence of incredibly powerful computational tools for modeling, scripting and projective design research, these tools cannot replace immersive, experiential, and collaborative learning practices.

In the final week of the workshop, after two weeks of intensive investigation of the six resource flows, we gave a complementary assignment to the Urban Analysis Drawing. As a tool for gathering intelligence in the field, each team designed a prototype graphic questionnaire in order to facilitate conversations



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with Muara Baru residents around their relationship to these everyday staples and resources. The goal was to develop a working tool that can generate useful data for UPC's future negotiations on behalf of the community and, more generally, for recalibrating perceptions of this kampung's status. Students were asked to target information that might expose the essential role this community plays within larger networks of Jakarta's economic, social and political relations. To this end, the forms of intelligence we focused on were those that often fall outside the quantitative measures of residents' physical environment, which in the relocation scheme, is conceived of as a spatial footprint entitled to each family unit. Rather, the intelligence each team assembled followed from the shared approach of the ongoing research and extended the qualitative methods of the preliminary data gathering.

Both assignments relied on the collaboration and intercultural exchange among students from each institution, who came from disciplines of architecture, urban design, landscape architecture, and engineering. Of course, the Bahasa-speaking teammembers from the Universitas Indonesia were essential in facilitating the interviews and navigating within the kampung, but more significantly, these Jakarta-based students could explain the context of our research questions, especially the more opaque dynamics of community governance, informal economies, and household management. The degree to which we could penetrate these multi-layered compositions really emerged from a policy of openness to new or conflicting information and adaptation to changes of course or variations among relationships within collaboration. In fact, the brief for the workshop came at the end. As instructors, we deferred making claims about our work or articulating in specific terms what its outcomes would be; in this context, the brief had to follow up the observations, discoveries, and the failures of our initial research activities.

Through these coordinated research efforts—the urban assemblage drawing and the information gathering tool—this studio attempted to plug into an

Figure 5: View from a home in Muara Baru.

#### ENDNOTES

1. Abidin Kusno interviewed by Meredith Miller + Etienne Turpin, February 16, 2013
2. In June of 2013, the Inundation 2 studio directed by Assistant Professor Meredith Miller and Etienne Turpin placed students from the Taubman College of Architecture and Urban Planning and the School of Engineering at the University of Michigan into a unique design collaboration with landscape architecture students from Hong Kong University and architecture and urban design students from Universitas Indonesias. Through a three-week workshop in Jakarta, this interdisciplinary workshop examined the localized, synthetic interactions of built form, social patterns, and natural



Figure 6: Final Review in the kampung; students present their research to members of UPC and residents of Muara Baru.



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- systems to understand how the politics of water at the city scale have social and spatial consequence in a community in North Jakarta.
3. "Jakarta Case Study Overview: Climate Change, Disaster Risk and the Urban Poor," World Bank Report [http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1306291319853/CS\\_Jakarta.pdf](http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1306291319853/CS_Jakarta.pdf)
  4. See Abidin Kusno, on the project of transforming North Jakarta into the image of a global city, through ambitious infrastructural projects and related real estate speculations. ".....the urgency of returning to the coast as a catalyst for globalization is not only the imperative of waterfront competition in the region, but rather a particular crisis of self-imaging faced by the nation following the overdevelopment in the capital city." Kusno, "Runaway City: Jakarta Bay, the pioneer and the last frontier," *Inter-Asia Cultural Studies*, 12:4 (London: Routledge) 513-531
  5. For more on the Next-11 designation in relation to Jakarta's water politics, see "Jakarta: Design Research and the Futures of Hypercomplexity," by Adam Bobbette, Meredith Miller, and Etienne Turpin *MONU 17: Next Urbanisms*, as (November 2012): 56-63.
  6. Karen Bakker, *Privatizing Water: Governance Failure and the World's Urban Water Crisis* (Ithaca: Cornell University Press, 2011), 330.
  7. Achmad Lanti, Firdaus Ali, et al, "The First Ten Years of Implementation of the Jakarta Water Supply 25-Year Concession Agreement (1998-2008)" (Jakarta Water Regulatory Body, 2009) <http://www.jakartawater.org/images/stories/unduh/10tahunbrEng.pdf>
  8. Naomi Klein, *The Shock Doctrine* (Toronto: Knopf, 2007).
  9. Saragih, B. (2013, 01 28). Technology used to move clouds away. *Jakarta Post*. Retrieved from <http://www.thejakartapost.com/news/2013/01/28/technology-used-move-clouds-away.html>
  10. Jakarta was extensively inundated throughout January 2013. For a comprehensive report on the 2013 flood in Jakarta, see the special issue of *Tempo*, 28 January - 3 February 2013: 44-57.
  11. See Rudolf Mrazek, *Engineers of Happy Land: Technology and Nationalism in a Colony* (Princeton: Princeton University Press), 56.
  12. Abidin Kusno, "Green Governmentality in an Indonesian Metropolis," *Singapore Journal of Tropical Geography* 32 (2011) 314-331
  13. Edi Saidi in an interview with Ms. Herlily, to be published as "Urban Poor Consortium: Sharing Space, Sharing Culture" in the forthcoming book, *Jakarta: Architecture + Adaptation*, ed. by Etienne Turpin, Adam Bobbette and Meredith Miller (Jakarta: Universitas Indonesia Press)

existing and urgent circumstances, by positioning architecture as a means for inquiry, advocacy, and visual argumentation. Acknowledging the brevity of a three-week seminar, and the limited depth our research could reach, we still see the potential in applying a design approach to effectively account for the heterogeneous set of issues and interests that characterize Jakarta's relationship to its water, and to the various environmental threats.

The case of Muara Baru is just one example of numerous instances of ecological and social instability heightened by the anthropogenic climate change. Through the Inundation: Jakarta workshops, the Architecture + Adaptation research initiative seeks to adapt design pedagogies to new demands of contemporary urbanisms, pressurized by the increasing threat of environmental disaster.