Where the Sidewalk Ends: Reimagining Urban Place and Governance in Semarang, Indonesia

Emmaleah K. Jones

Follow this and additional works at: https://scholarworks.wm.edu/honorstheses

Part of the Asian Studies Commons, Biological and Physical Anthropology Commons, Civic and Community Engagement Commons, Community-Based Research Commons, Community Health and Preventive Medicine Commons, Cultural Resource Management and Policy Analysis Commons, Emergency and Disaster Management Commons, Environmental Design Commons, Environmental Policy Commons, Environmental Public Health Commons, Environmental Studies Commons, Geographic Information Sciences Commons, Health Information Technology Commons, Health Policy Commons, Health Services Research Commons, Human Ecology Commons, Human Geography Commons, Infrastructure Commons, International Public Health Commons, International Relations Commons, Leadership Studies Commons, Medical Humanities Commons, Nature and Society Relations Commons, Organization Development Commons, Other Anthropology Commons, Other International and Area Studies Commons, Other Public Affairs, Public Policy and Public Administration Commons, Physical and Environmental Geography Commons, Place and Environment Commons, Policy Design, Analysis, and Evaluation Commons, Politics and Social Change Commons, Public Administration Commons, Public Policy Commons, Quantitative, Qualitative, Comparative, and Historical Methodologies Commons, Social and Cultural Anthropology Commons, Social Policy Commons, South and Southeast Asian Languages and Societies Commons, Urban, Community and Regional Planning Commons, Urban Studies Commons, and the Urban Studies and Planning Commons

Recommended Citation
https://scholarworks.wm.edu/honorstheses/1073

This Honors Thesis is brought to you for free and open access by the Theses, Dissertations, & Master Projects at W&M ScholarWorks. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of W&M ScholarWorks. For more information, please contact wmpublish@wm.edu.
Where the Sidewalk Ends:
Reimagining Urban Place and Governance in Semarang, Indonesia

A thesis submitted in partial fulfillment of the requirement for the degree of Bachelor of Arts in Interdisciplinary Studies from The College of William and Mary

by

Emmaleah Kelly Jones

Accepted for __________________________
(Honors, High Honors, Highest Honors)

________________________
Dr. Joseph L. Jones
Director

________________________
Dr. Tomoko Hamada

________________________
Dr. David P. Aday, Jr.

________________________
Dr. Robert Rose

Williamsburg, VA
May 2nd, 2017
Where the Sidewalk Ends:
Reimagining Urban Place and Governance in Semarang, Indonesia

Abstract
Purpose: This project analyzes the uses of space and geography up the scales of political organization – from the village to the municipal – attempting to find the intersections where physical space meets governance using Semarang, Indonesia as my strategic case. This research employs a biocultural lens, addressing the existing gaps in literature by advancing a framework to function across disciplines and ultimately reconnecting to its practical application in urban planning and design. Such a framework is important in providing a blueprint for building a coherent and supportive structure on which to assess the human impact of design and contribute new “human-centered” solutions to the discussion of the way we plan, upgrade, and build our cities. Methods examined the formal planning strategies employed by the municipality to mitigate the city’s key shocks and stresses; the informal acts of community mapping and placemaking incited by community stakeholders; and the overlay of these two urbanizing processes; framing the study of the kota (city) and its governance in terms of their interaction in the built environment.

Practical Implications: This paper suggests that if participatory, village-oriented strategies were further encouraged and even facilitated by the city – especially in neighborhoods with high environmental risk – corresponding policy efforts and geospatial planning in building urban resilience will prove more effective and efficient. This paper further asserts the function of place and placemaking as a tool for leveraging village voices in urban development.

Executive Summary
Points of the Executive Summary:
1. The challenges caused by the rise and development of cities around the world, and their specific consequences
2. A glimpse of how cities tend to rise in general and the importance of linking the human-center of the city to its spatial planning
3. The meaning of space and place, and how spatial planning can provide places rather than spaces
4. The special case of Semarang and how above points interact in the city (with key dates, places, and forms)
5. Potential and what I propose to contribute to them, i.e. community planning, upgrading, and data collection through placemaking.
6. The How: how is this approach unique, and how to proceed.
Introduction:

Topic/Issue
Around 10,000 years ago, just as our planet emerged from the last ice age, humans began to experiment with a novel form of social organization. Instead of constantly roaming, hunting and gathering, we began to live in settled communities – the first proto-cities. Humans have become more and more urban at an exponential rate. Today humanity is experiencing, without a doubt, the most frenzied and concentrated phase of urbanization since beginning our urban experiment.

It’s become a cliché to say that over half of the world lives in cities. We breezed through that milestone in 2010, with estimates purporting that within another 100 years the world’s urban population will expand to over 9 billion people, over eighty percent of a total human population of 11 billion. As rural populations pour into cities and populations in Asia and Africa grow, the world is turning their gaze to see how many already densely populated cities will adapt to new constraints due to globally rising income, globalization, and changing climate.

Every day, close to two hundred thousand people leave their homes in rural regions and move to their local cities. That means almost a million and a half people a week move to cities, find land, and make a home where they can. This amounts to seventy million people a year, with even higher rates in places that are experiencing economic growth, such as Indonesia.

It is the urban areas of developing countries in Asia and Africa that will absorb ninety five percent of the world’s population growth by 2030. Whether to follow an entrepreneurial or educational dream, to adjust to economic transitions, or to adapt to the insecurity of agricultural labor, people are moving to cities whether the cities are ready or not.

Rarely does one find a political will to provide housing, but even in cities that plan ahead and build into unclaimed spaces, the pace of organic, informal growth – or growth that is self-built, unplanned and unregulated – far exceeds that of synthetic growth. Yet this is not a subject to be ignored. The consensus of planners and organizations alike is that ignoring rapid urbanization results in high levels of urban poverty and rapid expansion of informal urban settlements. The UN Habitat report on Informal Settlements (2015) acknowledges that informal settlements are caused by a range of interrelated factors including the usual culprits— population growth, rural-urban migration, and lack of affordable housing for the urban poor— but also emphasizes weak governance in the areas of policy, planning, land use, and urban management resulting in squatting and a subsequent lack of secure tenure across entire communities. Yet these sensitizing concepts are not well woven into a comprehensive understanding of the formality of urban space.

One word often used to describe these communities is slum. This is a word shrouded in negativity, increasingly used as a hollow buzzword rather than an informative or even accurate lexicon. The United Nations Human Settlements Program (or UN-Habitat) defines slums as “as a group of individuals living under the same roof

---


lacking one or more of five conditions: 1) access to improved water, 2) access to improved sanitation facilities, 3) sufficient living area – not overcrowded, 4) structural quality/durability of dwellings, and 5) security of tenure.\(^3\) Otherwise known as the ‘five deprivations,’ this description leaves much to be desired. Rather than giving a definition of what slums are, it offers nothing more than a list of what slums do not have: an ambiguous characterization of only absence rather than presence.

**Paper Digest:**

My primary objective in designing and pursuing this project was, firstly, to address the many critiques of urban planning as being too fixed and Eurocentric in this new, informal phase of urbanization, and – in response – provide an alternative methodology to reach the more difficult types of urban space and change through a holistic, emic understanding of Semarang city.

First, I will give an overview of the city of Semarang, Indonesia, and illuminate why I chose to study this example as a springboard for further discussion and research. Then, I will go over the more concrete research goals\(^4\) to frame core sensitizing concepts and final discussion. The following Background section and sub-sections will then cover the lens of this study, core sensitizing concepts, relevant terminology and background literature adopted from various disciplines, as well as expand on the context for the research – municipally, nationally, and internationally.

After this I will explicate the attributes of the primary research conducted in the city of Semarang, including: research questions, project design, and methods for collecting data at varying scales. As this project is mixed-methods, the data collected vary rather significantly, as illustrated in the following section, Data Management and Analysis. This project was also conducted concurrently with the primary application of this data, in both at the city level and in an urban village, so I also address these procedures in this section. To set the stage for discussion and conclusion, the subsequent Key Findings section addresses the intersection of the quantitative and qualitative discoveries of the data, converging on the topics addressed in the background section.

My ancillary objective in designing this project was to find a way to integrate the study of the formal and informal processes acting on urban space back into a responsive design strategy. Thus, my Discussion and Conclusion sections are structured on the terms defined in the background, and eventually operationalized. Finally, my conclusion will address the major limitations of this project and suggestions for further, improved research.

**The Case of Semarang: Overview**

As previously mentioned, we are living through the most frenetic and intense period of urbanization in human history – but this is largely an African and Asian era of development. Countries such as China, India and, of course, Indonesia are named as the ascending heavy-hitters in participation in the global economy, population increase, and, consequently, urbanization.\(^5\) It is estimated that by 2025, Indonesia’s total urban population will reach 182.6 million, which also means that 68 percent of their populace

---


\(^4\) See Note 1.

\(^5\) Ibid, 34.
will reside in urban areas; a mid-size provincial capital such as Semarang will be a key host of this new urban population.\(^6\)

Semarang is both a city and regency. It has historical significance as the colonial Dutch capital of Java and, as such, is the current capital of the province of Central Java (Indonesian: Jawa Tengah). The city itself is Indonesia's fifth most populous city, and at 373.78 square kilometers (144.32 square miles), it is also the fifth largest Indonesian city. While the actual city itself currently boasts a population of about 1.8 million people, Greater Semarang (Kedungsapur, which includes periphery regencies) has a population close to 6 million. The population of Semarang Metropolitan Area has consistently grown by a few percentage points since the 1970s, after some large-scale infrastructural changes. Since the 1970s, population has grown from around 700,000 inhabitants\(^7\) to around 1.5 million inhabitants in 2010; at the current rate, population is projected to hit 2.1 million inhabitants by 2030.\(^8\)

The province of Central Java is divided into regencies (or kabupaten). Due to the mass urban and, particularly, suburbanization of Java and of the city, “Greater Semarang” has absorbed the surrounding regencies of Semarang, Semarang Regency, the newly carved Salatiga city, Kendal Regency, and Demak Regency. Regencies are subsequently divided administratively into districts, known as kecamatan, which are further divided into sub-districts, called kelurahan, which are then even further divided, to be expounded on in further sections. These forms of administrative divisions are all absolutely formal. Yet in reality, in Semarang – as in the rest of Indonesia – the heart of sociospatial and political organization in the city is the village, or the kampung. Ironically, this is an informal body and the term, kampung, does not correspond to any distinct administrative units. Some of these have ethnic or religious associations, but the kampung identity is one that stands separate from other identifications.

The dominant Semarangian ethnicity is Javanese – which also a language that many residents speak alongside the official Indonesian language, or Bahasa, which is a standardized version of Malay – followed by minorities of ethnic Chinese, Indian or South Asian, Arabic, and others including local ethnicities of Sundanese, Batak, Madura, and so on. The majority religion is Islam, practiced by an estimate of 87 percent of residents, followed by Christianity and Buddhism.\(^10\)

**Geography and Environment:**

Semarang is a coastal archipelago city in the center of the northern corridor of the island of Java. The geography of the city is characterized by a dichotomy of coastal and hilly areas, making it vulnerable to various types of disaster risks such as floods, storm surges and landslides, as well as periodic drought due to Tropical seasonal changes.

The city is deeply, and painfully, aware of the impact that climate change has on the quality of life in the city. Climate change is worsening the impact of these disasters

---


\(^8\) "Issue Papers: Informal Settlements," 23.

\(^9\) See Note 2.

that already occur and adds the further hazard of rising sea levels in the long term. Various planners within the country of Indonesia, however, have championed the city in their literature as being relatively forward thinking in regards to its policy, integrating resilience into formal planning processes. Since 2009, before the 100 Resilient Cities program was initiated, Semarang was a hub of ACCCRN, or the *Asian Cities Climate Change Resilience Network*, also funded by Rockefeller Foundation. The city has made many public efforts to combat climate change-related vulnerability, and the most prominent studies featuring Semarang are centered on improving environmental resilience and better studying the impacts of disasters on their infrastructure. Following this interest, in 2010, the Indonesian national government produced a policy stating that all City Spatial Plans (CSP) should address climate change issues. Whether this investment of resources and attention directly translates to solutions is to be discovered anon.

Semarang perfectly encompasses the before-picture of rapid urbanization of an Asian city. At this very moment, the city is struggling to keep up with its development whilst also evolving to be a ‘smart,’ resilient city. It is already undergoing that typical process of absorbing and connecting to surrounding regencies, with periphery growth being mainly driven by private-sector suburbanization without much integration of resilience or governance into spatial development.  

This is why I have decided to study the case of Semarang, and particularly Indonesia. The country has a distinct context as a young, developing democracy with – a common theme in informal development – a colonial history a rising economy, and a booming population. On top of this, Semarang has actively sought to open discourse between individuals and the government, through recent policies facilitating improved transparency and accountability in governance, as well as improving local capacity. Moreover, Indonesia is considered the social media capital of the world, and Semarangians are highly active social media users. This was also an ideal attribute to contribute to a responsive, potentially SMS-based, data collection for mapping informal communities – one of the original goals of this research. Residents have a strong participation in the informal economy, and a cooperative local government that had recently collaborated with International organizations. As a student researcher set on finding sub-city spatial data, this condition is vital.

**Research Goals & Objectives:**

The overarching goal in conducting this research is to establish a generalizable framework to function across complimentary disciplines and reconnect to its practical application of urban planning and design. Such a framework of interdisciplinary concepts attempts to reach spaces where prior research has fallen short, or failed to generate suggestions for planning and design disciplines. Put simply, this framework was developed to provide insight into the reality of urban dwellers with the intent of its practical application.

This research is multilateral, culminating in a final suggestion of the theoretical framework’s application in planning. The first, most simple implication of this research is that if participatory, village-oriented strategies were further encouraged by the city— especially in neighborhoods with high environmental risk— corresponding policy efforts

---

to improve urban resilience will be more efficient and effective. The suggestions and conclusions are framed in the aim of contributing a coherent blueprint on which to assess the human impact of design and pose convincing arguments for re-evaluating the way that we plan, upgrade, and build our cities.

I argue that, if properly implemented, these interventions can address the overwhelmingly negative social impact that mass infrastructural improvement has on predominantly informal communities, and provide an alternative focus to traditional planning and upgrading in this new phase of urbanization. Furthermore, I argue that place-based design interventions hold potential for increasing the resilience of neighborhoods through the expedition of both the spread of information and the responsive collection of data. Lastly, and perhaps most importantly, the prioritization of places for community planning can galvanize previously-unheard voices, effectively connecting the human center of the city to its planning.

Background:

Lens and Justification

The issue of urban growth is acutely interdisciplinary. Professionals, academics and planners attempt to understand the realities of urban life through the various disciplines of planning, public health, political theory, design, and the like. However, blind spots remain where fusion falls short. After a thorough review of relevant literature, I am still unaware of any current publication that synthesizes the contributions of the disciplines of anthropology, public health, and urban planning into an analytic framework for use in the 21st century. In an attempt to address these gaps in the literature, this paper aims to maintain a dialectical perspective, borrowing relevant vocabulary within anthropology and certain subfields, as well as public health, geography, and urban planning/design. To reinforce this approach, the methods employed in this research included several theoretical and empirical tools from these fields.

Such a perspective is made necessary by the need for explicit attention to land use and design as inhibitors or assets to governance and determinants of community health, understood in this paper as an essential function of governance. Subsequently, this perspective aims to address the dearth of useful indicators within the built environment for understanding the progress and process of governance and community health. If explicit attention is not paid to the overarching goals of equity in cities, they have little if any chance of being realized in projects, programs, and policies that shape the built environment and therefore the public’s health.

This project takes a biocultural approach to the issue of understanding the technical processes acting on urban space, and to deconstruct the political ecology of a mid-size city in Indonesia. When discussing urbanity in any capacity, I posit that a synthesized, human-centered approach is required to develop any realistic suggestions for governments and community actors to implement. The biocultural synthesis is this


13 Ibid, 1095.

paper’s precedent to understanding the historical, socio-cultural, and political economic context of the city of Semarang, with regard to the key concern of governance.

**The Biocultural Framework in an Urban Context:**

Humans have always had a symbiotic relationship with our ecology, and we consistently modify our environments – directly and indirectly – to satisfy our societal pull for resources.15 Cities house patterned concentrations of people who consume food, potable water, and various resources or commodities. On an abstract level, environmental anthropologists assert that variations in the built environment are driven by mediation between our relationship to resources within natural landscape and existing political and economic processes, grounded in the historical urban morphology.16 The linkage, then, between human activity and anthropogenic landscapes intensifies with the density of people, thus inextricably linking urbanism and biology – both in regards to ecology and biological health.17

The biocultural perspective emphasizes the fluid social, political and economic relationships that produce our living conditions in a landscape, and interactions amongst them. Called the “biocultural synthesis” by many, it is most simply defined by the assertion of culture and biology as a fluid dialectic, both influencing and sometimes opposing the other.18 The underlying political, economic, and social structures of culture form an anthropogenic ‘ecosystem,’ which we use to connect to resources and to each other, what shapes much of our behavior, and ultimately what characterizes the environment that we rely upon to meet our basic biological needs.19 Our built environment – i.e. our cities, towns, and neighborhoods – can be seen as a concrete manifestation of this ecosystem, embedded in the larger natural environment.20 This explanation is also referred to in the biosocial perspective as the “materiality of the social,”21 which denotes that, in regards to population health, our built environments are “final common pathway” of history and socio-political-economic circumstances in the material world.22


20 Goodman, "Bringing Culture into Human Biology and Biology Back into Anthropology," 363.


See Note 3.

The study of health disparities and their roots in social and economic inequalities has emerged as an important theme in public health and the social sciences. Carrying on this theme, this paper acknowledges that health is intricately associated with cultural – particularly sociopolitical – processes. These processes are further embedded in the natural landscape, giving impetus to the examination of the biological consequences of culture. The sociopolitical emphasis of this relationship is termed political ecology; in an urban context, political ecology stresses the political implications of the uneven spatial distribution of health and wealth. The term is often used to field discourse on equity in coastal cities in light of climate change-related vulnerability. Using this delineation, this paper regards community health as a key function of governance.

A dominant proof of this concept is found in the relationship between poverty, measured in science by the term socioeconomic status (SES) and biological health. Yet while SES is almost universally accepted as a key predictor of specific health outcomes such as high morbidity and mortality, further scrutiny the relationship revealed the linkages to be far more intricate. Despite the widespread, interdisciplinary usage of SES, there is still debate surrounding the semiotics and adequate appraisal of the variable in relation to its impact on health. Even the ideas surrounding what constitutes ‘health’ are a social construction, dominated by Western biomedical paradigm, as is referenced in Michel Foucault’s coinage of biopolitics and biopower in the series Society Must Be Defended. This is perhaps because the most persistent health impact of SES does not occur at just one level but at the intersection of different bases of disadvantage. Disparities in SES, and consequently health, are embedded in the larger physical processes associated with social disadvantage. Put simply, poverty also impacts health through its sociospatial implications, in such forms including but not limited to: restrictions on where people can afford to live, reduced land values in vulnerable or undesirable areas, and – as some would argue – the legal ambiguity of a city’s periphery.

The biocultural framework employed in this research places importance on equally acknowledging these interactions at their respective scales, reinforcing the assertion that neither the biological nor the cultural realm should be isolated from the other in its study. Yet in its application in reality, the knowledge that the framework generates should be targeted.

See Note 4.


See Note 5.


Applied Bioculturalism:

This paper primarily focuses its concern to an urban scale and its administrative divisions. The objective of adopting this theoretical framework at the city level is to reunite with its practical planning and design potential. Thus, this section aims to ground the abstract theory of bioculturalism in the relevant understanding of the planning, design, and governmentality of physical space. These considerations are further supported by the methodologies of this research.

Discussions of urban space tend to circulate around two key paradigms: that of ‘top-down versus bottom-up’ and that of the formal to informal spectrum. The former is shorthand used to describe the impetus behind actions for urban change, and – this research argues – a reductionist, unproductive crutch in the literature.

The latter, however, posits that urban space can be approximately placed on a spectrum of formal to informal influence that primarily acts on that space. At any point in time, space is being acted on by various legal, political, and social processes; these jurisdictions can be highly passive or active, and their interaction can and does impact the manner of the built environment and the activity within it. A space that is primarily informal is not completely impervious to formal processes, but the dominant actions or actors shaping it are considered informal – meaning illegal or quasi-legal, unplanned, and unregulated. The considerations for placing urban areas on this spectrum consist of numerous variables with differing levels of importance, including but not limited to: presence or absence of prior formal planning, legal or secure tenure, and formal infrastructure. Formal space, conversely, is the standard frame of reference conjured by the word city, and is normally defined by the presence of a public authority, organized by formal designers, and planned with access to services, resources, and representation in mind.

The formality of space is largely dictated by the attributes of the sociopolitical relationships within it, referred to in this paper as governance. To elaborate, governance encompasses the mechanisms through which a formal body enforces policy, regulates organization, protects rights, and distributes services. Yet it can also have a much broader application: when put in a cultural context, governance is considered an expression of the relationship between individual and society, in addition to formal authority. It is the pliant reality of how policies are enforced, how people are governed, and how authority is represented; but it should not be mistaken as a static extension of government, nor is it entirely formally codified. Furthermore, governance is constantly interacting with and even relying on the social realm to function effectively. This nuance is often overlooked, yet I argue that it this overlap between the social and the political realms that is central to the adequate function of democracy across the spectrum of space.

---

29 See Note 6.
usage. Cities are expanding unlike never before, filling in unplanned space organically and beyond the preoccupations of traditional planning, leaving a legal maelstrom in its wake.

In the industrial Fordist growth model, cities were firmly embedded in the regulatory and redistributive framework of the centralized state that held full formal authority in planning and building the city. Yet in a post-Fordist age of complex urban informality and flexibility, this model has become replete with failings and incongruities. As previously mentioned, many of the world’s most populous cities – mostly in Asia and Africa – are urbanizing quickly and informally; this challenges the prevailing Eurocentric paradigms of how to plan for urban growth and changes the way we see the future of the mega-city and its designers. Informal actors are now influencing the agenda of urban planning and urban politics by means of – as Steele and Keys put it – “temporary re-appropriation and animation of interstitial spaces.” Yet this then raises a question similar to that which Harvey posed in his book, *Social Justice and the City*: if “the problem of the proper conceptualization of space is resolved through human practice with respect to it,” then what is interstitial space and how is it used?

**Background on Semarang Indonesia:**
Semarang is an ideal place to discuss these larger concepts. The strong and sustained growth in the regional economy has sparked symmetric population growth; resulting, as previously mentioned, in a vast increase in the urbanized area of Greater Semarang and concomitant land use change. Yet the successful provision and management of services by the provincial government is lagging in many sectors. In spite of its developing economy and increasing property development, Semarang’s planning and infrastructure – such as transportation, building green space, affordable housing, improved water, healthcare, and education – have not kept pace with demand. Furthermore, transparent and effective governance remains a loaded issue in Indonesia in general, contributing to a sociopolitical gap between the government and the people.

The heart of sociospatial organization in the city is the village or the *kampung*. Urban and rural village governance is a hotly contested political issue, and yet while it is technically an informal body, the *kampung* is the subject of complex national and regional policies and holds a distinct place in political organization. Most simply, as discussed by Hellman, the term *kampung* is used as a local expression to denote geographical belonging. Yet despite this, *kampungs* typically do not correspond to any distinct boundaries or administrative units – meaning, that if one tried to look up the *kampungs* of Kemijen or Bustaman in GoogleMaps, they might not be able to find it. In

---


36 Ibid. See also Steele and Keys.


39 Hidayat and Sulistyo, "Is Average Governance the Best Indonesia can Hope for?" 38.

the typical translation of the word, *kampung* means village. Yet the urban word for village is different from the rural word, *desa*. In Poerwadarminta’s Indonesian Word Book, *kampung* is equated with *desa* but also implicitly with uncivilized behavior and city blocks of low status. 41 This association is harsh and hyperbolic; though living in an urban *kampung* is associated with poverty and antiquity, certain amount of nostalgia for a traditional life style also imbues the concept. 42

*Kampung* societies are full of acting subjects and “strong local impulses to community.” 43 They are active communities full of agency and informal authority as well as relating – not always without conflict – to the political and administrative structures put in place by the modern state. 44 Hellman approaches the *kampung* as “informal social relationships entangled with a specific place.”

In terms of political structure as in other cities, Semarang is lead by a Mayor (or a *Walikota*, currently Hendrar Prihadi) and supported by a city manager and four city assistants responsible for: Government Administration (overseeing governance departments); Economy, Development and Welfare; Information and Networking; and General Administration (operations). These assistants report directly to the city manager, and implement the city’s spatial plans developed by the Regional Body for Planning and Development, or BAPPEDA (*Badan Perencana Pembangunan Daerah*), which sits in the Economy, Development and Welfare department. While there are several planning systems relating to various sectors, the central vein of planning – development and spatial planning coordinated by BAPPEDA with support from Ministry of Public Works (or DPU, Indonesian: *Dinas Pekerjaan Umum*) – includes three timelines: Long term development planning (RPJPD) with a 20 year strategic time horizon; Mid-term development planning (RPJMD), reviewed every 2-years and revised every 5-years and encompassing the Mayor’s vision and mission; and Annual planning, which provides the yearly implementation direction for the Integrating Climate Resilience Strategy into City Planning in Semarang, Indonesia RPJMD.

Yet, as clean-cut as this whole process sounds on paper, the reality of its effectiveness, speed, and transparency is far from perfect. Only recently has local administrative power been allocated to regencies from the national government, with a law as recent as 2014 and, due to this, gaps in local government management still need to be filled. 45

Until 1999, Indonesia’s governance was strongly centralized; most regulation and policy was made at the national level and applied across all cities. Yet, after President Suharto resigned in 1999, the country rapidly transformed its government system through lighting bolts of legislation for the broad decentralization down to district levels. Though intended to improve political representation by providing greater autonomy to local regencies and cities through supporting policy development and budgetary decision-making at local levels, these changes also brought numerous challenges to the country.

---


44 Hellman, "Living with Floods and Coping with Vulnerability," 469.

45 Law No. 32 in 2004 and Law No. 33 in 2004.
Many of these smaller regencies and cities were not ready, in terms of capacity and planning, to take on this new authority, which was not accompanied by thorough preparation for decentralized management and budget authority. This eventually led to explosive, unresolved disputes between sectoral agencies over planning authority and budget allocation. Due to continued limited capacity and experience, delivery of key public services was, and largely remains, poor.

This remains within the top bracket of priorities for the city of Semarang. On top of this, other key political priorities of the municipal government, as brought up in the literature, center on resilience, efficiency, ecology, and health; these include mobility/transportation, public space, mitigating disaster risks, and dengue fever outbreaks. For the purposes of this research, the latter two priorities will be discussed more at length.

Disasters:

As previously mentioned, the main natural disasters that affect the city are floods and landslides, according to the Semarang Disaster Management Agency (BPBD). Yet, despite affecting the city in numerous ways, flood mitigation practices are underdeveloped and recurring major floods cause death, serious material losses and put a severe pressure on the whole city economy.

The northern coastal area of Semarang floods constantly, with some areas flooding every time the tide is high. In 1960, this northern section of the city was filled with water disposal sites, but in 1971, these sites were destroyed to build housing for local workers in neighboring industrial sites as well as fishermen. Flooding occurs in Semarang due to the absence of adequate protective walls and dredging, high tides, rain or storms, deforestation to the south, heavy rains in the mountains that cause rivers in the city to flood, high tides and strong winds, sea level rise, poor drainage systems and the lack of maintenance of the river as well as increased waste thrown into the river. Yet, no matter how these floods occur, the majority of people that live in areas affected by them do not live in a bewildered ignorance; they have complex technical knowledge as to the various causes of flooding.

In 2007, the National Ministry of Public Works developed a policy – titled Public Works Act no. 26/2007 – stating that every regional and city spatial plan must consider disaster safety procedures and evacuation plans, including evacuation plans for climate-related disaster. City planning departments have yet to fully and distinctly address climate change issues in their City Spatial Plans (CSP), due to failures in local capacity as well as budget allocation. However, the Ministry for Public Works developed this policy to mitigate a dangerous attribute of poor planning – lack of adequate Emergency Disaster Plans.

Dengue Fever:

A central concern of health professionals and city planners alike is the epidemic of Dengue Hemorrhagic Fever (DHF). Though Semarang is well within the regional

---

46 Hidayat and Sulyisto, "Is Average Governance the Best Indonesia can Hope for?" 38.
48 Ibid.
average income and health outcomes, the city has the highest incidences of DHF in all of Central Java. According to the Indonesian Ministry of Health, in 2014 the incidence rate of DHF reached 92.43, accounting for 14.7 percent of cases in the province. DHF is a disease a *flavivirus* that is generally transmitted by the Aedes aegypti mosquito. As all mosquitoes, the Aedes aegypti mosquito breeds in standing water, this the outbreak of dengue is inextricably linked to flooding, inadequate drainage, and poor water management – a cause for extra concern in the face of rising sea levels and climate change.

In 2010, Semarang began their concerted efforts in the prevention of dengue fever; that year, the Semarang City Government established the Regional Regulation No. 5 for the Prevention of Dengue Fever that required cooperation across all municipal departments related to the health sector in Semarang, based in the Semarang Health Office (DKK). A year later in 2011, the city established the Management Information System (MIS), but the reporting was limited and, thus, rife with inconsistencies. Since then, there have been numerous concerted efforts without much success. Yet finally, in 2013 – with the support of Indonesian Mercy Corps and the Asian Cities Climate Change Resilience Network (ACCCRN) – Semarang implemented the Actions Changing Incidence of Vector-Borne Endemic Diseases (ACTIVE) program to take place until 2016. The ACTIVE program consists of two integrated prongs: a Health Information System (HIS) to disseminate accurate information about dengue fever in the field, and a Health Early Warning System (HEWS) to actively monitor outbreaks. Still, the program is new and while the collection may be adequate, transfer of the data is still slow. Data on the outbreaks of dengue fever by clinic became available just last year, yet only for the years of 2013 and 2014. Still, this stress to the city emerged as one of the subjects of my methodological application.

**Interstitial Space:**

Characterized as blank, empty or “in-between” space, *interstitial space* is referred to obliquely in urban planning as borderlands, the periphery, and the margin. Architecturally speaking, it can refer to “both physical and conceptual spaces located at the edges of urban form and practice,” which could apply to any multifunction space in or around a building, such as patios, verandahs, balconies, corridors, etc. In urban and social sciences literature, the concept of interstitiality focuses on places and practices that transcend fixity, falling in between the cracks of what constitutes formality and informality. The commonality that can be found amongst the characters of interstitial space are that it is ambiguous; a form of “loose space” – as opposed to “tight space” – that is largely unplanned and unregulated. These spaces are “left out of time and place” with regard to their fixed urban surroundings, mainly as a consequence of decentralized rapid urbanization.

In this paper, interstitial space is largely understood in the functional, political manner of Steele & Keys. In the context of governance in the built environment specifically, this kind of space encompasses quasi-legality – meaning that even though many of these spaces are built illegally, they are not socially illicit or even abnormal. The

---


52 Ibid.
general social atmosphere surrounding the legal repercussions of illegal land use is mostly connected to its relevance. In many places, such as in Indonesia, there is even a ubiquitous reverence for the historical and social ties that many communities have to the places they occupy, and are only called on to vacate that space if there is some specific reason they must move. Their quasi- legality combined with the appearance of ‘non-planned’ planners, the one-dimensional logic of formal design and mono-functionality of control make it difficult to incorporate the complex vitality of these indeterminate spaces into planning procedures. Too often they are threatened in their existence and pushed to the margins. This paper affirms the belief that interstitial spaces are central to the future development of cities, but speculates that this interstitial space between formal and informal urban space usage is where governance is least understood and least effective.

Moreover, this “daily usage” understanding of space is offered in opposition to and as a critique of the intellectual stalemate of “top-down versus bottom-up” (TDBU) in urban design and planning literature. This perspective denounces TDBU as being rooted in Western preoccupations about urban growth\(^53\) that falls far behind the reality of dynamic urbanization, particularly in non-Western cities.\(^54\) A litany of academic discussion surrounding current urban development is grounded in this outdated assumption that overestimates the role of planners and policymakers. The reality is that the urban fabric is predominantly being shaped by a very different set of informal, and semi-formal, actors that are largely impervious to the planning and policy-making efforts made by the city. Furthermore, this paradigm pits fundamental informal processes of governance against the formal. While typically depicted as conflicting, the reality is that these forces and their actors are constantly collaborating, or attempting to collaborate, and the failures lie not in their coexistence but in their communication.

There are absolutely improvements that must be made to improve access to health, water, sanitation, et cetera, but in reality these informal settlements are homes and businesses, and they have creativity and resources to offer the future. About 85 percent of all new employment opportunities around the world occur in the informal economy.\(^55\) These urban settlers mix more concrete than any developer, lay more brick than any government, and have created a vast informal economy. The question of “solving the problem of slums” is a misguided one. Instead, I aim to reframe the inquiry to ask what planners can do to amplify local voices and resources of the rich social networks in interstitial space to solve the problems produced by the unmet needs of urbanization.

As early as the 1960s, British architect John Turner argued this point about the *barriadas* in Lima, Peru.\(^56\) He noticed that the urban poor were much more satisfied building their own homes than letting the state determine where and how they lived; this was, as he discovered, a consequence of the rich social life woven into the livelihoods of the barriada communities. Turner believed that – socially and quantitatively – Lima’s informal settlements were “the most effective solution yet offered to the problem of urbanization in Peru.”\(^57\) Governments could not meet the demand or the expense of

\(^{53}\) See Note 8.


\(^{55}\) See Note 9.


\(^{57}\) Turner, Ibid.
building a more effective alternative to individual informal settlement, and the combined wealth and labor of the poor was far greater than what the state could give. These settlers only needed assistance in leveraging these assets for their own benefit. Thus, Turner posited, the only solution to rapid urbanization was to support, socio-politically, the informal construction of homes; to understand “housing as a verb.” As a discussion on urban upgrading, in this paper I aim to understand ‘place’ as a verb.

Following in Turner’s wake, many urbanists speculate: the uncertain status of these urban ‘no-man’s-lands’ could incite the emergence of a new, spontaneous order: an un-planned ‘urbanity.’ Interstitial space is truly an opportunity. The interstitial spaces and practices – especially those gravitating towards the informal – are where new urban paradigms, creative urban change, and “new transformations to a different social condition” can rise, especially when supported by the city’s sociopolitical web. This paper asks what role does interstitial space have in facilitating communication amongst the forces that it exists between? How do different human practices create and make use of interstitial space?

**Place:**

Our cities and our homes occupy space, but the meaningful relationships and symbols that we form to and in that space cast its meaning into a completely different category. This interaction between our familiar associations and the physicality of the tangible world builds a sense of ‘place.’ Physical design alone can aid in evoking a sense of place, but really places are “directly experienced phenomena of the lived-world and hence are filled with meanings, real objects, and ongoing activities.” Place is not completely grounded in physical design, nor is it bound by the purely phenomenological: there is also an element of function and, particularly, social activity to place. This research acknowledges that there are multiple variations of the definitions of place, each grounded in the widely varying perspectives of the study – yet this research focuses on the simple behavior-focused, urban design definition.

While the objective of this framework is to plug back in to the fields of urban planning and design, this does not include the suggestion of specific design interventions in form. Put colloquially, while this paper emphasizes placemaking, the perspective is grounded in “everyday urbanism.” As Crawford explains, proponents of everyday urbanism maintain their point of view at ground level, and suggest that, “design proposals …be informed by an understanding and appreciation of everyday activities.” If designers apply high design assumptions or elite spatial form precedents to their work in cities, especially in low income and/or informal areas, they run the risk of isolating real

---

58 Cohen, Ibid.
community issues and – thus squandering the intrinsic sociopolitical value of interstitial space.

In urban planning literature as in practice, the concept of spatial planning is often criticized as being too rigid, monofunctional, and largely over-scaled when imposed on informal settlements. To make improvements on the quality of life for people living in these communities, the answer is neither to move them out nor to completely reconstruct roads and homes. These suggestions are based in Western preoccupations about the desires of the poor and the direction from which the impetus for urban change occurs, as mentioned previously. If spatial planning can adjust to a more highly localized scale, it can utilize the existing social resources, which in their cohesiveness can best be characterized by a Durkheimian mechanical solidarity, in interstitial space to understand place, on a nontraditional canvas – a developing Asian city.

International Development: 100 Resilient Cities

A massive implicit factor in any kind of urban development work, especially in Low and Middle Income Nations – also referred to as Developing Countries – is the role of international financial institutions, foreign aid, large private corporations, and international for-profit and nonprofit organizations. Companies like IBM, IDEO, Arup, USAID, AusAID, and MercyCorps – to name a few – are fielding the discussions on which innovations to invest in next. This is not to mention the colossal economic wake left on both the cities themselves and the global trends in terminology and approach by Bretton Woods institutions and development banks, such as the World Bank, the International Monetary Fund (IMF), the Asian Development Bank (ADB), and many more. All too often, applied research overlooks the impact that globalization and economic institutions have on developing cities. Practically speaking, very few – if any – infrastructural improvements, projects, and even policy interventions can be implemented without the economic backing, and one commonality amongst each of these organizations is the demand for metrics – which typically means quantitative data – to frame the picture of a ‘successful’ project and to justify any further investment.

There are multiple consequences of this practice, but one externality to be addressed here is the imposition of an organization’s terminology on the city in which it works. Some describe this imposition as being oppressive and neoliberal, while some defend it as being pragmatic and helpfully comparable. This paper does not take a particular stance on the debate, yet maintains that organizations should take precaution to put responsive measures in place in ensuring the effectiveness of the projects they pursue. This includes adequate research into the cultural contexts in which they operate. The development terminology used in this paper is thus informed by the position in which I came to the city of Semarang.

I was given the opportunity to participate as a student researcher and spatial analyst in the 100 Resilient Cities (100RC) procedure. Coined a “Platform Partner” by 100RC, my role was to engage with the city’s leaders to build capacity in the city’s

---

63 Turner, ibid; Burdett, ibid.
64 See Note 10.
65 See Note 11.
66 See Note 12.
67 See Note 13.
geospatial analysis by designing maps for use in policy and project working groups surrounding key shocks and stresses of the city. The objective of these maps was to facilitate productive discussions and cooperation within the 100RC network of service providers and partners from the private, public and NGO sectors.\(^{68}\) In this position, resilience is the ‘hip’ development jargon and practical target to which ‘successful’ interventions strive for. The term is ecological in origin, used to describe an ecosystem’s elasticity following disturbances in its system. In the context of development, it was originally adopted to describe a city system’s response to natural disasters; yet now the word has taken on more complex meaning.

The organization of 100RC defines resilience as “the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.” Put more simply, a resilient city has the ability to absorb disturbances and still retain its basic function and structure.\(^{69}\) This means that resilient cities have developed built-in systems to intercept damage that might undermine it; they can adapt to shocks without destabilizing the entire urban system, which strengthens the city’s built environment, especially its infrastructural networks. However, a city’s systems are not purely formal or physical, and it is important to note that within the overarching term, there are sub-categories that encompass attributes to holistic resilience. These include the economic, social, and the political systems within a city, as well as its environmental and infrastructural systems.\(^{70}\)

The pressures countering resilience are categorized as chronic stresses or acute shocks. Stresses are persistent, and “weaken the fabric of a city on a daily or cyclical basis.”\(^{71}\) Examples of stresses include: high unemployment, inefficient public transportation system, endemic violence, and chronic food and water shortages. Acute shocks are sudden, often severe events that threaten a city, such as earthquakes, floods, disease outbreaks, and terrorist attacks. Many confuse this concept with ‘sustainability,’ but while there are some commonalities, there are also important distinctions between the two. Urban sustainability can be modestly defined as anticipating the limits to the resources that feed a city’s local, regional, and global systems that, once breached, can lead to its rapid decline. Urban resilience, in comparison, is defined as reducing dependence on scarce resources and diversifying the systems themselves in anticipation of future shocks and stresses. Hence, the more resilient a city is, the more sustainable it will likely be. Resilience places higher importance on decreasing our over-dependence on certain resources, and is often more appropriate to use when discussing climate change-related vulnerability.

**Primary Research: Design & Methods**

This section outlines the primary questions and research design of this research, as well as justifies and discusses the practical implications and limitations of the study.

---

\(^{68}\) See Note 14.


\(^{70}\) See Note 15.

\(^{71}\) *City Resilience Framework*. November 2015.
Lastly, I will explicate the methods used in the study – including why they were chosen and how they were used. As this research involved human subjects, approval from the College of William & Mary’s Institutional Review Board (IRB) – registered with the Office of Human Research Protections – was obtained so as to ensure the safety and the appropriate use of humans subject data in research studies.

The design of this project allowed me, the researcher, the opportunity to explore the strategies employed by the municipality to improve its spatial planning in the face of key shocks, as well as to observe and participate in the actions incited by community stakeholders to improve their space, fully plugging in to the existing formal and informal networks of governance. I incorporated geospatial analysis as a methodological tool, in order to augment the understanding of the ‘real world’ consequences of abstractly academic discussions, i.e. interstitial space and its governance. Already this technique is used in some public health research and anthropological research, particularly in understanding the complexity and weight of social relationships in a space.\(^\text{72}\) However, this project is seemingly the first distinct biocultural application of the methodology.

**Research Questions:**

To begin with, the first phase of research questions asked: what are the qualitative differences of lived experience in different places across the city? What is the role of planners and designers in different kinds of urbanization? How do existing informal networks and stakeholders interact with formal government in space? How does the majority of urban change happen, and what is the stimulus, and where does it come from?

My second phase of research questions asks: what impact does participatory strategy have on urban resilience? How can existing strategies be used in building resilience? How can planners and designers adapt to different types of urbanization? How does the design of urban space impact political and social activity? What is the most effective practical intervention?

**Research Design:**

As this project’s theory was grounded in an interdisciplinary framework, employing mixed-methods was important to generate knowledge for a wider practical application. Though originally designed to be explanatory sequential with mixed-methods techniques to collect and analyze first quantitative data then qualitative data. However, given the nature of my role within the city as well as the limitations of this research – as will be expanded upon in the discussion – the design was reconfigured to best explore the opportunities with the data that were available for use. The outcome is a quasi-experimental, concurrent nested model, collecting information from different levels to strengthen the hypothesis, and nesting the quantitative data in the larger qualitative context.

Rather than apply a phenomenological method, a descriptive case study was chosen because it provides contextual conditions, especially when the boundaries between phenomenon and context are not clearly evident.\(^\text{73}\) This model gives parameters

---


and further adds controls to the study case in asserting its specific cultural and political context in its setting and boundaries, helping the researcher fully explore the specific, localized challenges.

This study was designed using a mixed methods approach involving the collection and analysis incorporating of both qualitative and quantitative data in tandem, drawing from strengths and compensating for the weaknesses of either approach. This design is meant to provide firm foundations in grounded theory, beginning with the sensitizing concepts of informal urbanization, place and interstitial space, vulnerable political ecology due to climate change. The emergent theory, at the nexus of the qualitative and quantitative data in planning, defends the function of using space as a tool and methodology in itself, used to survey the community’s capacity.

Methods:

As the original theoretical framework of this research is interdisciplinary, so too are the supporting methodologies. Throughout the data collection phase of this research, I employed a diverse series of tactics to collect both quantitative and qualitative data, at various levels of both formal and informal governance— the village, the sub-district, and the city level. Despite the originally intended research design, as previously mentioned, the nature of circumstance only allowed for the concurrent collection of data. At all levels, I downloaded and processed data from the open-source mapping website OpenStreetMap (OSM). Due to OSM’s open-source status, there is ample skepticism within the literature surrounding its use. However, I argue that due to the nature of open-source data, its users or co-researchers are constantly testing it for validity, and likewise the higher number of co-researchers is in itself a test for reliability. Additionally, the OSM data was constantly compared to the city’s data itself, which is arguably less responsive and less reliable in its collection.

For the sake of organization, I have decided to divide this section by political scale:

Municipal:

Multiple sources of data were collected for the city, including a panel discussion across various departments in the city hall (Balaikota), semi-structured interviews, participant-observation, and collection of historical materials, reports by both the city and various organizations, progress reports, photographs, as well as a survey of spatial data of numerous variables from various sources – including the City and Regional Planning Department of Diponegoro University, the Initiative for Urban Climate and Environment (IUCCE), the city itself, and OpenStreetMap (OSM) – and field notes contributing to a greater analytical density and in-depth conceptual understanding of the data. The city’s spatial data – as well as the OSM data – was processed using ArcGIS and, despite not being feasible to test for validity due to the unavailability of sub-city spatial data, was reliably consistent across data sources.

I worked directly with the city’s Resilience Office, which was developed for the city’s partnership with 100 Resilient Cities and consisted of individuals from BAPPEDA, the Regional Body for Planning and Development, IUCCE, MercyCorps Indonesia, and a

---


75 See Figure 1 in Appendices.
professor and researcher from the City and Regional Planning Department of Diponegoro University. My role was to learn the key shocks and stresses that the city wanted to address and develop maps for usage in their working groups for policy and project implementation, given the variables the city could offer me. My aim in participating with the city in such a way was to observe their spatial planning process in collaboration with the smaller scales of the city, as well as to better understand the nature of the city’s relationship to international organizations, particularly those that are obliquely ‘development-oriented.’

Importantly, I also conducted one semi-structured panel discussion with various department leaders within the municipality. Topics covered – as will be expanded upon in the Findings section – included, but were not limited to: top priorities of the city and their feasibility, the use of and access to services, participation in local organizations and local governance, and collaboration within and across the departments – both legally and socially.

District and Sub-District:

The sources of data at the sub-district (kelurahan) were collected using semi-structured interviews and collection of historical materials, as well as OSM data, photographs. The spatial resolutions of some of the city’s data were also divided by district and sub-district.

Village, or Kampung:

In terms of spatial resolution, citywide in certain variables were either extremely difficult or impossible to acquire at the village level, because either i) the data did not exist at all or only existed on paper,76 or ii) I was denied its access due to concerns of confidentiality.77 Data collection techniques at the village-level relied on in-depth interviews, participant-observation and collection of documents and data from OSM.

At this level, interviews with key informants – or co-researchers as many participatory researchers term them78 – were most important in providing rich depth to the spatial data; some were casual and some were semi-structured, and informants including representatives of village governments and other village leaders (such as teachers, social activists, and artists). These were conducted alongside heavy field notes and recorded observation. Moreover, I conducted group interviews with community members and urban artists on select topics, such as their views on and experiences with priority problems – such as flooding, dengue fever outbreaks, and transportation – as well as on collective action, local institutions, development projects, and general information regarding household welfare and demographics – particularly seasonal coastal abandonment.

Village data collection was concentrated in two key villages: one coastal village in the northeast corner of the city called Kemijen, and one high-density village in the north of the city called Bustaman. The OSM spatial data for these particular villages are much more detailed due to prior participatory mapping efforts with a locally formed organization called Peta Kota (hereafter referred to as PK), a collaboration between an

76 See Note 16.
77 See Note 17.
Indonesian urban artist’s collective called Hysteria and small development-oriented tech company within the 100RC framework called Ushahidi.  

**OpenStreetMap and Participatory Action Research (PAR):**

Undoubtedly, there is a relationship between public participation in planning and implementation, but there are currently no “foolproof” strategies to best involve public participation in planning – especially involving interstitial, informal space. However, there pervades a belief that the only acceptable solution to this issue would involve generating data for and from the perspective of a community member. In response, there are several overlapping strategies and terms to apply to this same process: community-based participatory mapping (CBPM), citizen-generated mapping (CGM), and participatory mapping. This paper chooses to focus on the generation of spatial data in particular – obtaining data collected through a multi-layered mapping process that seeks to involve as many community stakeholders in the process as possible. This method is referred to more broadly in this paper as Participatory Action Research (PAR).

PAR is a dynamic learning process in which the people involved are not static players; this strategy is also a springboard for community participation in governance and planning. It also aims to promote active participation in development, such as discussing potential strategies to address perceived risks and problems or crowdsourcing emic understand of community strengths, weaknesses, opportunities, and threats. The organization Ushahidi utilized this process in collaboration with Kolektif Hysteria and Peta Kota (PK) when they came to the city a year prior to this research.

Among other things, Ushahidi is a web developer and initiative design platform that works internationally to create development-oriented technology “to serve people with limited access in hard-to-reach places.” In 2015, the company came to Semarang to engage *kampungs* and “voices…traditionally left out of official decision-making processes” with the city’s government while simultaneously attempting to address data gaps. In the process, Ushahidi connected with an urban-focused artist’s collective called Kolektif Hysteria, which – since 2010 – had already been using their active social media presence for activism, producing vibrant street art in *kampungs*, and even creating large paper maps with community members. Hysteria was – and still is – focused on improving quality of life for the city’s poorest through convening diverse stakeholders, sparking inclusive discussions, and coordinating action. Together, the two organizations developed Peta Kota (which means *city maps* in Indonesian), with the main function of facilitating a two-part citizen generated mapping process, utilizing OpenStreetMap and Ushahidi’s citizen-report platform. Their website claims that this project was meant to be the bridge between city officials, academics, village communities, artists and activists.

As the majority of the spatial data I used at this small scale came from this collection, the participatory process of PK is an important aspect of the methodologies mentioned here, despite not having facilitated it myself. Thus, the two-step process is as follows:

---

79 See Note 18.
First, for a shared understanding of the city, PK and Hysteria trained numerous community members in the use of OpenStreetMap, and began the preliminary mapping on open map of the physical environment. Next, PK combined this map with reports collected from the Ushahidi platform, which collected information about hazards and resources in the area. Throughout this process, Kolektif Hysteria also collaborated with city officials to hold in-person community-mapping events, creating large paper maps with community members and the Village Representative Board (or BPD) to include more villagers’ additions to the map; thus offering multiple new pathways to participate and minimizing the negative impact of facilitating a purely digital mapping exercise.

The initiative ended in 2015, with not much to show for it: certain areas of the city were mapped in OSM with increased granularity, yet no formal policy nor infrastructural improvement was initiated.82 However, some on-the-ground community action did occur through the efforts of the small artist’s collective started by students in Semarang. I will go on to examine this in the Application sub-section of Data Management and Analysis.

Data Management and Analysis

In this section I will expound on the quantitative data collected, particularly outlining the spatial variables acquired by the city, and their details – including how the data were processed and integrated, as well as my primary findings. Ultimately, I will discuss how these particular data were applied during my time in Indonesia, from the village level to the city.

Spatial Data:

Following are the ecological variables used in the city’s spatial analysis:

Geology:
• Slope; Soil type; Ground movement; Seismicity; Faults; Subsidence; Alluvium; Elevation

Water/Water Networks:
• Rivers; Watersheds; Groundwater usage and extraction; Chronically flooded areas; Coastline; Aquifers; Clean water network, primary and secondary; Reservoirs83

Anthropocentric, or ‘human-centered,’ variables were collected from various departments within the municipal government, primarily, but not limited to, the Public Works Department (PWD) and the Regional Body for Planning and Development (BAPPEDA). Variables include:

Mobility:
• Roads and their reported condition, accident frequency, and congestion; BRT map, but without a schedule or bus stops;

Infrastructure:
• Wastewater drainage networks and direction; Electric network, including substations, power plants, voltage lines and types;

82 See Figure 2 in Appendices.
83 See Note 19.
**Built Culture:**
- Land use type, i.e. residential, industrial, forests, rice paddies; Key places, i.e. clinics/hospitals, port/airport, schools, and government buildings;

**Administrative:**
- Districts, including regencies, districts, and sub-districts; Population density; Poverty per sub-district;
- Historical maps of the city, which I digitized.

**Health:**
- Dengue Hemorrhagic Fever Outbreaks, reported by clinic or hospital;

**Planning:**
- Evacuation routes; Hurricane-prepared areas; Priority areas; Conservation zones; “Underserved Areas”; Nature preserves; Dam/pumping stations;

Supplementary anthropocentric data was obtained village-specific data from OpenStreetMap, as the detail of entries varied greatly across the city. OSM data includes variables such as built structures and type, such as residential, business, industrial, vacant, and so on. Additionally, DigitalGlobe – another partner in the 100 Resilient Cities network and a provider of extremely high-resolution Earth imagery – also donated satellite imagery data to the city, yet was not directly used in my analysis.

**Qualitative Data:**

The qualitative data collected in this study was mostly narrative, and was thus managed by transcription and semiotic coding of values and sensitizing concepts.\(^{84}\) I conducted various interviews, participated in placemaking for a village festival, observed the process of informal *kampung* collaboration, and conducted a panel discussion with various department heads within the municipal government – all of which were recorded and saved on an external hard drive in a secure folder.

As previously mentioned, most of my interviews with residents were semi-structured. Though this means each interview is different, some key in-depth questions about daily life, routines, services, socioeconomic status, and governance to cast the shape of the interview. Examples of these questions include, but are not limited to:

- Where do you get food?
- Where do you get water?
- Do you have electricity? Where do you get it?
- How do you reside?
- What problems do you encounter in meeting your daily survival needs? Where are the closest resources for meeting these needs?
- What are the hazards, or dangerous parts to this neighborhood? Why? Or, what parts of the city or the neighborhood do you avoid? Why?
- Where did/do you go to school? Or, where do children in this community go to school?
- Where do you go if you are sick or injured?
- Where do you work? Or, where do you sell goods or services?

• Where do you vote? Do you ever go to government buildings for protests or community meetings?
• Where does your family live? Or, how many family members live in your house?
• How do you travel to other places in the city? Or, what is your mode of transportation? Do you ever use public transit?
• What do you do for income? Where do you work?
• Why do you live here? How long have you lived here? How long do you plan to stay?

In my interviews with city officials, as well as the panel discussion, our topics covered the policy priorities of the city, the attitudes held by officials surrounding communities in vulnerable areas, the process of governance with such scenarios as, “What if my road has a blockage in the storm water drainage pipes?” and the process that individuals must go to in order to secure social services and public services, as well as plans and hopes for future city development. The panel discussion was held in Indonesian with key informants translating the information back to me. More details on specific interviews and findings will be elaborated in the Findings section.

Application – City Level:
The objective of my work with the City Resilience Office was to develop maps for usage in policy and project working groups. Given the spatial data that was made available to me, and the key shocks and stresses of top priority to the city – as explicated in the City Resilience Strategy – I decided to develop maps with relevant indices to calculate risk and urgency in the areas of: Disaster, integrating Flood Risk and Land Risk; Dengue Fever Outbreaks; and Mobility. Further on, I also developed a map to represent “Replicability” for district and sub-district project implementation. Using ArcGIS, I analyzed the spatial distribution of the relevant variables – as illuminated by interviews, collection of reports, and observation – looking for patterns and discerning confounding variables.

The final product took the form of numerous maps that were then transferred back to the city. The only maps that required using formulas were the Disaster Index and population density maps. The latter was manipulated to consider potential replicability of programs, and was mapped based on both its actual value as well as its standard score, also known as its position on the Bell Curve or its z-score.85

Due to the incredibly diverse geography of the city,86 the Disaster Index was considered an equal balance between the respective risks associated with the land, or more precisely the geology, and risk associated with floods. These I calculated converting buffers of key features to raster datasets, reclassifying them, and subsequently adding them together in a weighted overlay. The final product of ‘Disaster Risk’ is an equally weighted overlay of the flood risk and land risk indices.87

Application – Village Level:
Though the collaboration with Ushahidi ended in 2015, Hysteria still works through PK to continue facilitating the participatory methods for community action in

---

85 See Figure 3 in Appendices.
86 See Note 20.
87 See Appendices; Figures 4 – 9.
order to strengthen “the capacity of citizens through the identification, distribution, and utilization of knowledge for the daily good of the city.”

In the beginning of 2015, the Japan Foundation selected the director of Hysteria at the time, Ahmad Khairudin (known to me as Mas Adin), to curate an art series for social engagement as a part of their Run & Learn: New Curatorial Constellations Program. Hysteria crowd-sourced funds and received grants from both the city and the Japan Foundation to curate and produce a large-scale art project in the extremely crowded urban kampung of Bustaman. This project included a village art festival, a photo contest, a storytelling-through-art workshop with the village children, numerous permanent public art installations inspired by the village, and a re-design of public space in the cramped, cluttered spaces of the village. This was not the first time that Hysteria had collaborated with a kampung, but it was the first art intervention that they had waged at this scale.

In the summer of 2016 – when I was collecting data in the city – Kolektif Hysteria decided to expand their operations to a high-risk coastal village towards the northeastern quadrant of the city. This project was, too, a huge undertaking that centered on placemaking through art, and included a children’s puppet workshop and a village festival with numerous performances of music inspired by the kampung. This project also included a mural of map that I made next to a large mosque. The map was developed from data given to me by the city as well as OSM data that included key existing places in the city such as the mosque and prayer rooms and the local kindergarten, streets, water-pumps – all superimposed on a map of land subsidence occurring in the village, in centimeters per year. There were sections of the map where streets were subsiding at 8 centimeters per year on average; the objective of painting this mural was to use chalk or paper to interact with it to develop emergency evacuation plans, to point out which roads were flooded, which pumps were broken, and which houses are abandoned by its dwellers, as well as to plan adaptive behavior such as soil replacement in sections subsiding at high rates. I will go on to discuss the lessons gleaned from this in the Discussion section.

**Key Findings:**

In this section I will relate the quantitative and the qualitative findings of the data, and the intersection of the two. The material will be condensed to include only topics addressed in the background section, such as sociospatial implications of environmental and health vulnerability, social organization and mechanical solidarity, and political organization of formal governance.

Despite getting access to numerous spatial variables provided by the city, anthropocentric sub-city data that was consistent, accurate, and up-to-date proved extremely difficult to come by. As I will discuss in the following section, there is much speculation – and even skepticism on the part of the disenfranchised – as to why this is the case, however in large part the data blind spot has to do with the history of political structure of the city and its contribution to a lack of capacity in collecting, managing, processing, and communicating data.

One key finding I did have, however, even by interacting with data and with international organizations is that data is what drives the inception of many projects. That is to say that data, especially Big Data, offers confidence in decisions and probability of benefit from an investment; it can be compared, across projects or over time.

At least to initiate work in a city, international organizations and consultants are primarily interested in data. The problem is that most of the data that Semarang has is
analog—or only on paper—and would sink a lot of manpower and resources to digitize and subsequently use in this age of big data. This is true of many other small to mid-size cities in Asia as well. Moreover, current methods of data collection are not perfect, and collecting relevant data from scratch takes an exorbitant amount of time and resources, especially considering that most of the companies I was exposed to worked in countries scattered about Asia. Beginning a new project without pre-existing data is not exactly the best investment of an institution’s resources.

This proved to be one of the central reasons behind a specific collaboration forged between the city and, ironically, a research organization from Singapore that promised to yield usable data to support project implementation. Transportation data is the easiest and fastest data one can collect. This, combined with the fact that many Asian cities are increasingly congested, leads to cities prioritizing projects such as road improvement and public transit whilst the cities are literally sinking; however, international organizations reinforce this by rewarding these projects with their resources and networks.

Maps\textsuperscript{88}

I developed numerous maps for the city in its project implementation; however, the most relevant maps to this research were those surrounding disaster risk and dengue fever outbreaks. In terms of disaster, the data yielded fairly predictable results with the majority of the combined risk being concentrated in the northern coastal areas, particularly the eastern side. The land risk in particularly was concentrated to the south-central, hilly areas that lie close to fault lines. The population density map showed a concentration of people in between these two areas, in the center of the city, with the exception of a corridor of high population density to the south, right next to a vein of extremely high land risk.

Dengue fever proved to be a much less predictable variable, with values from 2013 and 2014 remaining relatively constant. Though I developed various maps for comparison of dengue outbreaks and variables across areas of the city, there was no strong correlation between any of the variables compared except Waste Levels in those districts and speculatively, Poverty. The latter can only be speculated due to the lack of valid data for poverty levels in the city; half of the districts had “No Data” on any type of income level in the area.

There is some association with highly vulnerable villages and poverty, i.e. low land values as observed in NJOP data as well as in the aforementioned maps. However, in my qualitative data collection, I found that it was much more likely that people grew up in that village and stayed for its social networks, history, and ancestry or that they make a living in the area as an industrial worker, a fisherman, or a service worker that requires regular clients.

Interestingly enough, I found that there are certain impressions of ‘who lives where’ throughout the city. For example, a desired place to live is in the mountains to the south because the “water is fresher and cooler,” however, as it is far from the coast, the air is noted as being warmer and drier. The center of the city is considered to be cramped high density living or fancy apartments, depending on how close one is to skyscrapers and hotels surrounding the two large malls, Lawang Sewu – a famous tourist attraction – and City Hall. To the south of the city is Tembalang, where the incidence of Dengue Fever is rather high, but also where the large university – Universitas Diponegoro –

\textsuperscript{88} To reference the maps made for this research, please see Appendices 4 – 9.4
resides. This area is filled with “guest houses,” or cheap long-term stay hotels, and coffee shops, Internet cafes, and late night food stalls, for students. Towards the coast, villages have a reputation for being filled with poor people living in dirty conditions with a high vulnerability; they are also considered to be socially isolated from the rest of the city.

On the opposite side of the city, towards the north central area lays Kota Lama, or the old city, which is rapidly gentrifying due to its architecture and historical significance. For a long time it was ignored by the city government and left to be filled by squatters who live in slum conditions. Recently, however, a massive uptick in public investment has caused the city to re-evaluate the area as a massive potential for tourism. However, as with many historical renovations in cities, this signals a shift in formal political behavior regarding the squatters in Kota Lama. Indonesian law states that if residents can prove that they have been living on a plot of land for a certain period of time – informants told me that this is 20 years in Semarang – then they do not need to produce a deed to have the right to live there, unless someone else comes forward with one. However, this also means that through the process of eminent domain, land values of these squatters are severely diminished by the city, and public opinion is that their remuneration does not compensate for the loss of a home, of social networks, and local income in the name of upgrading the city for tourism. This shift from ignoring the squatter settlements to rapid public prioritization of tourism has caused much local conflict, as hundreds of people and numerous traditional kampung markets have been displaced.

**Built Environment**

Like most Indonesian cities and throughout the Malay World, Semarang is characterized by a “weak urbanism,” in contrast to other Asian cities throughout China, Japan, Vietnam or Thailand, which had strong traditions of urban centers.°° The center of a traditional, pre-colonial Indonesian settlement was the katon (also called an istana), or the palace. Even linguistically, there was no concept of a ‘city’ in Java. During Dutch colonialism in Java without preexisting words meaning ‘city,’ bandar (or port) and kota (or fort) were reused to designate the places that became cities with a city government. In Semarang, the center of the city is where the Balai Kota, or city hall, Lawang Sewu (meaning One Thousand Doors) – an old train station built by the Dutch. Now – after the construction of two huge shopping malls – the city’s population is concentrated here. Yet even still, weak urbanism indicates a lack of necessary urban institutions and insufficient provision of basic services to inhabitants. In Semarang this means a lack of planned public space, walkable sidewalks, poor road conditions, lack of affordable and efficient public transit, among other things. Moreover, despite progress that has been made in the city, the primary health concerns facing the city’s residents are caused by the physical conditions of the places in which they live and work.

A core issue in the infrastructure of Semarang is water: its management, sanitation, distribution, and so forth. Though there has been some citywide progress on mitigating chronic flooding. Beginning in 2011 and completed in 2014, the city improved its drainage system, built polders in the Semarang River and the Jatibarang dam. The development has lead to the significant decrease of the level of floods in the western part

---

of Semarang’s coastal area, however there is much more progress that could be made; the entire eastern coastline floods regularly, as do numerous other areas in the city.\(^{90}\)

Sociospatially speaking, the topic of flooding is vastly contentious and sensitive for a few reasons, the first being that the city’s poorest settlements have grown over many years closest to the coastline, along waterways, natural rivers and reservoirs – therefore contributing to the pollution and clogging of these areas. These communities consist of low-lying settlements with houses built with mixed materials and concrete. Some of these houses are self-constructed and built on land without formal legal title, and are filled with people working in informal jobs. Coastal land is understood by all as highly vulnerable and – in my interviews with government officials – it was clearly considered a confusing choice to live there. Still, Indonesian kampungs have a long, well-respected history. In many of these areas, some individuals and families have lived in squatter settlements for decades, thus well established social networks and cultural identities of place run extremely deep. Yet one of the key points in my conversations with the city was that coastal residents’ income is inextricably tied to their existing location, and moving from their area to others areas is not considered an option, because “they are embedded.” So the city is presented with a choice: either to move them or to allow them to stay, and teach them how to adapt with the shocks and stresses. The coastal area in Semarang is incredibly vulnerable, but even the government prioritizes adaptation for the sake of preserving existing socioeconomic networks. This is an attitude that is largely informed by the economy of the city; the poor in Semarang – as well as all of Indonesia – are integral members of the city’s economy and incredibly productive. The informal economy is commonplace and exists tête-à-tête with formalized markets.

While the numbers for Jakarta may be slightly lower, and remain hard to accurately measure for obvious reasons, up to sixty eight percent of Indonesians across the country make their living through informal means.\(^{91}\) Residents of informal settlements work as maids, janitors, satpams (security guards), parking attendants and also run small local businesses such as warungs (food stalls) and small tokos (retail kiosks). In coastal settlements specifically, fishermen are key to providing larger companies with supplies of fish to sell across the city; likewise, the rice and other crop farmers towards the south supply larger companies with rice to sell across the city. This is yet another reason why public space and street congestion are such crucial issues in the city; a massive portion of people use streets as their main place of business. While there are specific laws to better organize the management of tokos and food stalls, in Semarang, those regulations are relatively loose. For example, an informant told me that when he was a young man, he and his friends got together and ran a warung (food stall) on the side of the road for a month or so. They never obtained any permits for this business; they simply wanted to make some extra money.

In the following sections, I will expand on the cultural context of the city, taking care to deconstruct the ethnic and historical background and its place in the city’s sociopolitical organization.

**Social Organization**

As previously mentioned, the majority of city residents actively practice Islam, yet – as this is the largest city in Central Java – the majority of the ethnic makeup of the

---

\(^{90}\) See Note 21.

city is Javanese. Most people either learn some of the Javanese language in schools while speaking Indonesian (also known as Bahasa) at home, and some residents grow up speaking Javanese at home. There is also, however, a sociospatial implication of this language distribution of the city – many isolated, poorer communities throughout the city as well as on the periphery of the city speak Javanese, or some colloquial dialect of it, more fluently and frequently than the average Semarangian.

Partly this has to do with the fact that Javanese and other sub-regional identities are considered to be very strong and important to your family, which is highly central to Indonesian life. One can even find the distinction of district, sub-district, and village identities. Two of the people I worked closely with in the city were from the town – and administrative center of the greater Semarang Regency – called Ungaran and many times they joked that people may not understand them because they speak in “Ungaranese,” which essentially encompasses colloquialisms and accent.

Still, partly this has to do with reverence for history, and respect for the preferred language of the person one is talking to. The type of language one uses – in both Javanese and Bahasa – is dictated by relationships, or more specifically, the kind of relationship the talkers have to each other. For example – while Indonesian/Bahasa does not have any kind of verb tenses to dictate past, present, or future – there are various words that are used depending on how familiar one is the subject, or if that person is older than you.

Historically, this was not always the case. Bahasa is a modified version of Malay that was standardized in Indonesia, yet the majority of colloquial language-speakers speak Javanese. The Javanese language is much more complicated in this social regard. From what was related to me in interviews, Javanese has three main registers within the language to regard another individual – with some honorific exceptions that are rooted in Old Javanese – each employing their own separate vocabulary, grammatical rules, and even inflection. Combine this with distinct humilities that one uses to refer to oneself in each of these registers, Javanese is truly a relational language. Even most Javanese people themselves do not usually master the full system, especially considering the variation in the language’s prevalence throughout the city. I discovered this when I was working in the village of Kemijen. One of the artists laughed when he heard the children talking excitedly about me being there. He then told me that the children were speaking in Javanese, and were referring to me in an old register used primarily to refer to “princesses” or nobility. I tried to ask him what they were saying, and he told me that he could not understand them but could only recognize the formality.

Interpersonal relationships are deeply important to the people of Semarang, and to Indonesians in general. This is reinforced not only by the language but also through various other social and economic processes. Most Muslim Indonesians value praying with friends and family, and – unless attending University in another area – many do not move out of their family home until they are married.

Reinforcing the value of social ties to Indonesians, mealtimes, tea, and coffee (kopi) are distinctly social activities to Indonesians, and important informal economic behavior as well. Food in Indonesia is so cheap that many do not consider it necessary to cook for oneself on a regular basis. Furthermore, I never once saw any people – other than myself – eat alone. For example, before Ramadan began I was working in the Urban and Regional Planning office at Diponegoro University (UnDip); every single day, the women working in the office bought a family-style lunch for the entire office – including me – to eat together. As previously mentioned, the poor are integral to the economy of the city, and often the primary suppliers of its food. The area of the city is filled with
highly dense settlements and businesses, but is also thirty four percent non-irrigated agriculture and twelve percent irrigated rice paddies, managed by kampung farmers to sell to street vendors called warungs, which is only reinforced by these social behaviors.

**Political Organization**

There is a fluid dichotomy of formal to informal in Semarang’s spatial growth as well as the manner in which spaces are governed. The heart of sociospatial organization is the neighborhood, in certain cases understood as the urban kampung. Adopting Hellman’s definition of the kampung, it can be considered in the analysis as “informal social relationships entangled with a specific place.” However, the most recent major law on village governance – Law 6/2014 on Villages – defines villages as: “A legal community (including traditional villages) within the territory of a district,” that is a “hybrid system between self-governing community & local self-government.”\(^9^2\) This is to say that villages are allowed to democratize their organizational life; currently, villages teem with community and mass-based organizations, either associated with their occupation, religion, hobbies, or with the village itself. The government initiated this law so as to “recognize the traditional rights of village communities; strengthen weak governance arrangements; and empower villages to meet their own development needs, reducing poverty and social inequality.”\(^9^3\)

Pertaining to its formal political integration, this was hotly contested since the 1999 resignation of President Suharto. The nebulous geography of a village is allocated – and potentially divided – into administrative sectors of Rukun Tetangga (RT), neighborhood units, which are grouped into Rukun Warga (RW), which in turn are aggregated on the Kelurahan level. The Governor appoints the leader of each Kelurahan; therefore their position is formal, though not elected.

An RT, the smallest formal unit of administration, usually consists of a few hundred subjects and one administrative leader elected by the community. However, the position of the RT leader is a combination of being a political representative and state bureaucrat; they represent the people vis-à-vis the state bureaucracy in a semi-formal role, elected position. However, I later discovered that most of the city’s data does not go this far down.

Through these RT leaders, community organizations and citizens can make “proposals” to the Lurah, the head of the Kelurahan, to gain support and specifically financing for projects they cannot fund for themselves, such as infrastructural renovations after a flood, buying pumps and hoses, and any other problems associated with Public Works. Yet, importantly, this route is only utilized when the villages and/or the RT cannot pool enough funding to fix the problem themselves. Despite not being provided with much formal authority or economic resources, the RT leader is also vested with administrative functions, such as signing letters and forms necessary to get identification cards and social services. They organize and distribute charity that reaches the communities from higher up the scale of governance, especially during states of emergency and disaster situations. Yet this is not their most important function for the community; the importance of RT leaders really lies in their symbolism. They are meant to mediate local social conflicts and, ideally, help to maintain stability and harmony in

---


93 Ibid.
the neighborhood. The role of an RT leader is truly an essential one, as they serve as a representative of the informal processes and actors to the formal political structure. They are considered the magnified voice of the individuals, and are typically very central to the goings-on and spatial planning of the community itself.

As mentioned in the overview, Semarang has three timelines for their development planning: Long term development planning (RPJPD) with a 20 year strategic time horizon; Mid-term development planning (RPJMD), reviewed every 2-years and revised every 5-years and encompassing the Mayor’s vision and mission; and Annual planning, which provides the yearly implementation direction for various departments, and which has been the concentration of efforts to integrate Climate Resilience Strategy into planning. The plans result in documentation used to provide inputs – but not necessarily direct orders – for city development. They form the basis of infrastructural planning in the city, and legitimize land use planning decisions.

The process of developing the mid-term plan (RPJMD) begins with a survey of the information needed for RPJMD development, including an assessment of statistical data for the city in the last five years, accommodation of related laws and policies, evaluation of previous RPJMDs, as well as coordination with provincial and city long-term development planning and spatial planning. The RPJMD is then drafted, outlining mid-term and prioritized program activities for the city during the next five years. Once a second draft is developed, the government team conducts a musrenbang to prioritize short-term action.

A musrenbang is the annual process of public participation conducted at the sub-district level, led by the head of each sub-district and attended by representatives of the community residing within that particular area. The word itself – musrenbang – is an abbreviation of three words in Bahasa: masyawarah, meaning “community discussion,” and perencanaan pembangunan meaning, “development planning.” Developed so as to better target and collaborate with the needs of the public, the purpose of this meeting is to ensure that emerging issues are discussed with villages and to decide on short-term priority actions. Results of the data collected in the musrenbang serve as inputs for the final draft of RPJMD, completed by the RPJMD team along with BAPPEDA.

**Discussion:**

A key research question to follow the establishment of the framework is: how can planners and designers adapt to different types of urbanization? In response, this research firmly suggests that “places” can function as a tool for leveraging village voices in urban policy interventions and project development.

I suggest that developing places in interstitial urban space can concentrate existing social resources, such as community solidarity, into a functional forum to collect vital qualitative and quantitative data. In this view, places are effective vectors for collecting and distributing information surrounding key priorities and adaptations of informal actors, directing communication between citizen and government, anchoring community-upgrading efforts, and legitimizing the role of informal stakeholders. Ultimately, this research suggests that the design of places as localized community-planning hubs offers tremendous potential for the development and implementation of concrete, highly localized solutions to shocks and stresses.
**Biocultural Behavior**

Despite affecting the city in numerous ways, large-scale flood mitigation practices are underdeveloped and recurring major floods cause death, serious material losses and put severe pressure on the entire city economy. As mentioned in the overview, floods can be caused by any number of reasons, all compounded by land risks such as the groundwater extraction in areas with steep slopes, causing the city to sink. Flooding is such a common experience that flood mitigation is taught in schools, not as an emergency, but as a routine. In coastal villages, many residents have adopted both large and small adaptive behavior for chronic flooding. One of the behaviors that struck me most was that residents will buy soil every 5 years or so to put on their floors, to raise the floor just a few inches above what would previously be flooded. Many of the houses in Kemijen had been doing this for years: their houses’ roofs were low to the ground and their floors were below street level, as the street had been upgraded over the years. Moreover, most houses had a drainage ditch in front of their front doors to avoid small floods. A more serious adaptive measure is seasonal abandonment of homes. Many people in Kemijen would leave their homes for specific months out of the year, to come back when the flooding subsided. Some people abandoned their houses altogether. Still, the majority of people stay.

**Value of Social Networks**

As mentioned in the previous section, the role of an RT leader is unique in its quasi-formality, yet it encompasses one of the key arguments of this research. As a stakeholder in the community itself, the elected position is largely tasked with diplomacy between the informal mechanisms of urban growth and change and the formal mechanisms previously ignorant to the desires of his village. This pillar of the community compliments the social organization of Semarang’s culture in order to fill out the gaps in its political structure. In doing so, this Durkheimian mechanical solidarity is the cohesive binding agent that possesses intrinsic value to provide to the surrounding political structure. This role serves as a quasi-formal buffer for the adequate governance of the city. Public social life in Indonesia is vibrant and closely linked with the behaviors and knowledge of individuals. Moreover, given the governmental structure of Indonesia and Semarang, the solidarity of social life could even be considered to have a numeric value as well. Economically speaking, it would cost the government much time and money to formally replace the function that informal mechanical solidarity performs for free. These networks provide security, familiarity, bring business, and transfer knowledge and are effective in facilitating behavioral adaptations to environmental vulnerability – as I witnessed in Kemijen. The stronger and more diverse social networks are within a village, the more resilient that village can be – socially, politically, economically, and ecologically. This research leads me to believe that this social resilience can also be designed for through responsive placemaking.

Political and academic understanding of the need for planning and upgrading exists; the issues arise in political cooperation, budgeting, and finding the political will to target certain issues. This brings up permeating complaints of residents surrounding the lack of accountability of the local government, and very distinctly Indonesian attitudes surrounding how well the government works and where their priorities lie. Specifically,

---

94 Sudoyo, "Total Losses for Jakarta Flooding Hit Rp 32 Trillion,” 1.
the attitudes of *kampung* dwellers were surprisingly warm towards international organizations and cold towards the municipal government. There was a pervasive attitude amongst informants that large-scale community upgrading was a huge threat to the integrity of the *kampung*, and that the formal political structure operated completely beyond their contribution. Moreover, many people both within and outside of the *kampungs* believed that the government was not upgrading the city to improve the quality of life for the people but to increase influxes of tourism and public investment, as in the very public case of the upgrading of Kota Lama. This distrust was reflected in the interactions I had with both public officials and villagers; in one interview, my informant told me that I would likely have a much easier time collecting digital files of spatial data than approaching village members in the coastal area.

On the other hand, the government officials I interviewed were aware of these attitudes and referenced efforts made to improve services and transparency. Officials mainly pointed to a lack of capacity as their reasoning for a failure to provide for citizens’ services. Particularly in coastal areas, there is also a slightly defeatist attitude where officials acknowledge that residents will not move – even if it may be in their best interest – and yet there is only so many actions the government can take in the form of adaptations, without extra help. This attitude is reinforced by an uptick in extremely public efforts to invite large international organizations to participate in development, while scores of village efforts go unnoticed; as mentioned, large-scale upgrading is seen as a threat to villages and maintaining their social networks.

*Place as an Anchor*

The work that Hysteria does was, by far, the most effective design intervention I observed when I was in the city. As aforementioned, due to their existence in interstitial space, informal spaces and actors are largely impervious to larger-scaled policy and planning interventions. For example, I heard many residents complain about how the government promised more public space, yet discovered that a local park had been built without the knowledge or participation of residents. No one used the park, as building a park is not the same as building a place. One of the ways that Hysteria accomplishes this is through public art that was inspired by and made for that specific village.

Public art – combined with community participatory mapping – gets to the core of the social and cultural processes acting on village space. Hysteria’s efforts in placemaking is not only aesthetically pleasant for village residents but also functions as a tool for leveraging village voices in urban policy development. The strategies that Hysteria employed are tools that organizations and city governments can facilitate, and planners and designers can emulate. I will now go on to discuss the major themes addressed by Hysteria’s work; not to serve as a rulebook for planning places, but to serve as a successful example.

*The Cases of Bustaman and Kemijen*

In 2015, Hysteria mounted a massive art project as a part of a larger series organized by the Japan Foundation. Taking place in the densely populated urban *kampung* of Bustaman, this project – along with the one I contributed to in Kemijen – addressed key issues of the villages, as well as emphasized important symbols of the areas. Hysteria focuses on key issues as well as assets facing the villages. In Bustaman, for example, the crowded urbanity of Bustaman in particular was central to its project;
the most populous alley of the village, *Gedong Sepuloh*, has about ten houses with a combined population of 140 inhabitants.

The project in Bustaman was the second in a three-part series called *Tengok Bustaman*, or Look Bustaman; this second project was titled Bok Cinta, after a slang idiom crafted by the youth of the village. Physically, Bok Cinta is a place that is made from concrete bricks in one of the houses. In Javanese, this construction of a ‘Bok’ functions as a place to sit around – usually to meet friends and chat, among other things. In his description of the meaning of this place, the Director, Mas Adin, said: “This kind of habit creates a sense of belonging, solidarity, and occasionally generates creative ideas. The term ‘Cinta,’ or love, shows a psychic dimension and positive image. The absence of good public space in that area made *Bok Cinta* become substitutional public space for its residents.”

One of the cornerstones of the project was its involvement of every person in the village, including the official and unofficial leaders, imams, food stall and small business owners, children as well as teachers, homeowners, and so forth – making sure to involve them on multiple occasions. Their placemaking efforts required logistical cooperation with the residents. For example, there were multiple sessions where artists and local residents cleared trash and debris from unused lots, installed new street lighting fixtures, rerouted carts and stalls to a different central location, and organized a park for bikes so as not to block the narrow entrances to the village. Improvements in the roads, drainage, and lighting were mounted where necessary.

Also on the logistical coordination of these efforts, the collective acquired permission for every piece of art on every wall in every space of the villages, therefore remaining flexible to the idea that certain homes will want to be more involved than others, and potentially encouraging residents to talk to their neighbors and participate. The artwork also followed by certain themes and rules, most of them revolving around the goal of evoking a sense of pride from the residents.

The central rule of the village art was that it must be either inspired or made by the village residents. This facilitated other important themes in the work, such as incorporating famous or important symbols. For example, Bustaman was historically built around a goat slaughterhouse, now moved to the edge of the village, and thus the art was popularized with a ‘goat spirit’; Kemijen is next to the river and an old railroad, and their murals are centered on these facets of historical village life. In central locations, artists paint huge murals with the aforementioned symbols as well as long narratives and pictures explaining the historical significance of the village and its founders. This all aims to evoke a sense of pride in being from this place, in the history of its symbols and its ancestry. These murals are mostly bright and colorful, especially in central places. As these villages are often poor and isolated from the larger city, the dual value added by bringing both enjoyable aesthetics and a sense of pride is exponential.

---

96 Ibid.
97 See Figure 10.1 in Appendices.
98 See Figures 10.2 and 10.3 in Appendices.
99 See Figures 10.4 and 10.5 in Appendices.
100 See Figure(s) 10.6 in Appendices.
Moreover, Hysteria aims to design places with activity in mind. Simply beautifying a space does not guarantee that people will use them. However in Kemijen, artists made public games boards on water pumps, developed “green space” in a formerly unused hut, and involved the local children in a toy-making workshop and, afterwards, put the toys in a previously unused brownfield and tent. One of the most interesting murals I saw was in a particularly cramped alleyway of Bustaman. The mural was of a beautiful park with green space and shade, with a caption that read something along the lines of “What do you want to see here?” with a blurb underneath that wrote about the need to hold the government accountable for building usable public spaces such as the one envisions in the mural.

Along this vein, I chose to paint my map on a wall closest to the central mosque of the village. All throughout the year, particularly during Ramadan, all of the village leaders set a table up in the middle of the street, and eat/break-fast together. This is all in plain view of the map, in the hopes of facilitating their discussions about the village planning.

All of the art created was unveiled in a large village festival that attracted people from all the way across the city. Further cementing villagers’ pride in their place, Hysteria is sure to secure the attendance of important government officials, including – in the case of Kemijen – the mayor himself. Throughout the villages were framed and hung photographs of the process of the art and the placemaking, which people could peruse while they were waiting to watch performances by modern and traditional musical artists, dancers, and oral historians. On a more practical note, the festival also brought an influx of business to the village food stalls and craft sellers.

The overarching wonderment of this event and the overall project was that artists did all of this; art brought city officials, art improved income by bringing visitors and painting on food carts, art built pride and confidence of the residents in the value of their home. There are plenty of initiatives occurring in the city that attempt to connect low-income residents to the medium-term regional planning, but inevitably there are shortcomings in how far those initiatives can reach. In just a few short, relatively low-budget events, Hysteria brought more improvement in day-to-day quality of life for kampung residents than ACCCRN could do in 8 years. Now, thanks to Hysteria, Bustaman is considered a new art center in the city due to the open cooperation between the residents and the artists. Placemaking connects spaces and people, but this research also does not want to ignore the global context of development, and its impact on development. Why eliminate the practicality of place’s function as both a means of acquiring data and of connecting spaces and people?

**Place and Resilience**

Similar to literature on the vulnerable squatter populations living on the riverbanks in Jakarta, the sentiment of Semarang city’s government is that those communities are settled the wrong place for progress, and that residents should take offers of money and resettle in less vulnerable locations. While there is still a lapse in precise poverty at the district level, the most vulnerable populations of the city live in villages in the southwest corner of the city – on steep slopes close to major fault lines,
relying heavily on groundwater extraction, and thus at a high risk of landslides and earthquakes – as well as in villages on the coastline, where the risk of land subsidence and various types of flooding is not only great but inevitable, and quite common.

As mentioned in the background, the legal structure of land-use and tenure in Indonesia generally recognizes squatters’ rights to settle. Semarang’s city leadership recognizes communities’ right to exist where they are, but also views these communities as impeding various proposed flood mitigation and land restoration projects. Many of the villages have been offered incentives to leave their homes but have largely denied or ignored them. To use Polanyi’s (1944) terminology, they are “embedded in socio-economic relations connected to a specific place and specific persons who function as their safety net in times of distress.” Additionally, to borrow from Durkheimian social theory, their strong social ties, and thus the mechanical solidity of the village unit, contributes to their own capacity for resilience; villagers see only the insecurity in disconnecting themselves from the network that supports them in times of shock or stress.

As one of the largest threats undermining the mechanical social solidarity of informal kampungs is relocation for the purposes of upgrading infrastructure. In this sentiment, place protects social resilience. This can enhance a community’s overall resilience in adapting to environmental shocks or stresses, as well as economic and political stresses. These sentiments serve to reinforce the concept of placemaking as an anchor for future kampung improvement projects. Developing places can concentrate that solidarity into a forum to collect information in the form of discussion as well as in the form of functional data. Moreover, these places should be designed as community-planning hubs to develop—and eventually implement—concrete, localized adaptations or solutions to shocks. I will go on to discuss the form, function, and flow of these places to best harness the design potential in an Indonesian context. Social – and consequently, economic – resilience fills in the political gaps of governance, and I argue that infrastructural improvement at social expense is not truly resilience, and even more costly in the long term.

The second purpose mentioned in this research was to establish a framework upon which to begin building models, maps, and best practices to better inform spatial planning and improve governance in developing cities. Especially in a city like Semarang, studying place and its material form allows planners to begin to understand uncertainty related to climate change in new ways as well as the potential means for identifying opportunities for adaptation planning. In addition, a new focus on physical planning for environmental health can identify the areas that both fields have thus far ignored as well as the regional and topical biases in research related to health and climate change. (Rosen) As much of the urbanization happening in developing Asian cities like Semarang is considered organic, unplanned, and “beyond the capacity of formal governance,” this informality should inform a city’s planning process. The question then becomes: how can a city accomplish this?

Planning for Place

Interstitial spaces rely on a communication between these ground forces that swell from communities to the city. Developing a place out of space is a process to which city planning can adapt, but a process that cannot be achieved without community

---

participation. It takes more than building a small park to get people to use and understand a space. In Indonesia, the mechanical solidarity of the villages flows fluidly all the way up to the municipal leadership and makes even impromptu collaboration quite flexible; this is arguably an effect of the widespread prevalence of interstitial space combined with strong community and social ties. Yet in this solidarity, therein lies a practicality in its function.

There is a spatial disconnect between formal design & informal growth; the speed and locations of growth are considered to exist beyond a city’s capacity for governance. Often past the physical boundaries of the city, or beyond what is considered safe environmental conditions, spatial growth occurs organically, and space does not simply exist passively, but is constantly used. However, the reality of a city’s informality and its future growth is often at odds with a planner’s “ideal growth.” As mentioned previously, many critique formal planners as designing for a blank canvas rather than a living city – despite their best efforts to connect at the ‘ground-level.’ Of course, this is not always the case. Specifically in Semarang, there is also a critique of the planning department being too disconnected from distinct departments – such as Health, Waste, and Disaster – in its planning strategies, on top of inadequate technical capacity across and within departments. I encountered this when working with the planning and Municipal Waste Departments; nobody really knew how much digital data they had, how a lot of it had been collected, nor how to process or use said data. Therefore, any efforts made to adapt places to be hubs of community data collection should also be accompanied by efforts to improve a city’s capacity in spatial data analysis.

However, a central reality for this research is that policy does not get developed without data. This, as mentioned, pressures certain projects forward faster than other because of this data preference. For example, data for transportation is relatively easy to acquire because the infrastructure and social culture of technology greatly favor it. However, this does not mean that other aspects of urban planning cannot be designed to facilitate data collection as simply as roads. Now, more than ever, developing space requires data – but that’s not all it needs. Efforts in placemaking and community mapping are less visibly important, but indirectly help to consolidate voices. Despite warning against its pressure, this paper recognizes the importance of data-heavy, quantitative fields being more amenable to apply qualitative concepts – beyond such variables as poverty, i.e. replicability and capacity. In order to make place-centered development a feasible option for large projects, one needs to connect place to its data potential.

Neighborhoods could deeply benefit from using high-tech and often potentially obtrusive concepts such as user-generated data and an open-source data culture, but there are obvious limitations to their usage. However, it is possible to make ‘high-tech’ concepts ‘low-tech’ available, and thus rendering them accessible for practical use by a community that thrives on in-person communication. Due to limitations of the research to be mentioned anon, I could not test how effective citizen-generated data can be in its governance, however I was able to discover how places could potentially operate the collection of data, as a tool for villagers to organize and communicate to a government that is increasingly oriented away from them and towards the global stage.
Conclusion

This research was conducted with an international development organization, which influenced the capacity at which I was acting in the city of Semarang. This informed my induction, yet influenced the direction of my perspective and my framework. The research was designed to be interdisciplinary and mixed-methods, yet the grounded theory was largely focused through the biocultural, anthropological lens, despite borrowing terminology from sociology, geography, international development, and urban planning and design theory. However, the final actualization of a practical, operational framework was structured – as previously mentioned – to be reconnected to the planning and design disciplines. The data of this research informed a framework of place-focused international urban development, particularly in informal settlements, to serve as an anchor for social networks in larger-scale infrastructural projects, as well as a hub of qualitative and quantitative data collection. This is offered in response to, and as a critique of, the global emphasis on Big Data in official development assistance.

The framework and suggestions made in this paper are not meant to obscure the vital contributions of large-scale planners and the importance of altering the citywide physical landscape to mitigate the worst effects of climate change. In fact, this framework is meant to compliment and plug these citywide efforts for resilience into the kampung’s adaptive capacity and the intrinsic value of social resources. Planners and policymakers must not overlook the social realm as an important contributing factor to a city’s overall resilience. Forecasting literature informs planning by identifying, either explicitly or implicitly, mechanisms in the built environment and in policy to improve health outcomes in the face of increased risk of climate change-related shocks. This paper simply posits that planners must exploit interstitial spaces to fluidly join the formal and informal processes together; policy and place are critical tools to achieve this.

The five and twenty year development plans are important to the future development of the city, but many of the miniscule changes they make are invisible to the residents themselves. I argue that formal planning and informal efforts must operate in harmony for productive change.

Limitations of Research:

The data collection phase of this research was limited in terms of time, timing, and resources surrounding the technical aspects of participatory mapping. Moreover, I was limited by being one person managing huge quantities of data on one computer; this takes a lot of time to manage.

There were various physical and geographic limitations on what could and could not be feasibly achieved, especially when regarding the fact that there was a language barrier blocking me from almost every person I interviewed. Moreover, true PAR requires the mass submission of community reports, presumably in Indonesian, and in-person community-mapping events, also in Indonesian. I would also need to train numerous co-researchers on the finer details of how to collect data from all over the neighborhood – presumably by walking. The primary phase of data collection began just a week before the start of Ramadan, meaning the vast majority of people living in Semarang were fasting from morning prayer before the sun rise until after sunset – from around 5:50 AM till about 5:30 PM. This offered a series of limitations on the involvement that could feasibly be asked of community members, co-researchers or informants, and volunteers for the sake of PAR.
Furthermore, there was some limitation on the type of data that could be acquired, the ability to test for validity and reliability of that spatial data, and the amount of data that can be digitized or transferred, processed, and managed in that time frame, on one computer. This is unfortunate considering the impact that Big Data has on facilitating particularly infrastructural projects. Yet while data drives large-scale development projects and policy interventions, it is only as accurate as its collection methods, which themselves are only as valid as the indicators chosen to represent the variable being studied. Moreover – regarding research in social science – fixation on ‘quantifying the qualitative’ risks evoking a distorted, reduced image of the world, therefore undermining the reality behind the variable. There is no absolute, purely positivist measure of the components of such notions as governance, resilience, capacity, and even poverty. The result of this fixation powers the impetus of partnerships that get created and projects that are invested in.

Further research should be more experimental in nature. Much more research could be done to test and establish metrics for understanding the impact of placemaking on the microeconomy, participation in governance – plus, consequential progress of this participation – and/or community cohesion and social resilience. One methodology that I would like to see further utilized in developing comparable indicators for the social significance of space is Boundary Line Type mapping: a GIS-based, cross-cultural and diachronic comparative vector method, used for mapping the socio-spatial significance of urban built environments.\textsuperscript{105} Combined with this, I see a huge gap in literature pertaining to the calculation of the economic value of social resilience; community solidarity picks up where the formal authority falls short, and this service has real worth.

Likewise, further studies in design should be mounted to uncover best practices for place-design in interstitial spaces. Design suggestions should be focused on developing responsive hubs for data collection and participation, particularly in ignored and unplanned settlements.

**Practical Implications:**

This research could be expanded and applied in diverse ways. Whole other projects could be mounted from the spatial data collected in this project alone – particularly the qualitative kampung data. Moreover, given the major limitations on this research, this project could be replicated and reformed to place a higher emphasis of primary data collection. Informal settlement maps could be made for residents to better develop emergency disaster plans, or to reclaim abandoned space in the area. For the sake of time, this paper will simply acknowledge the implications of this framework and focus, and highly encourage urban researchers and designers to see the potential uses of connected the informal and interstitial spaces in a city to its formal planning and political terminus.

Facilitating an interpretive and analytical spatial data collection practice as a routine form of governance is expected to stimulate future research to systematically explore society-space relations as manifest and developing in cities over time and in socioculturally contrasting urban traditions. This could lead to improved participation of informal actors in infrastructural upgrading as well an improved quality of life in communities. Moreover, a more nuanced, human-centered image of the city can be

\textsuperscript{105} Vis, "Mapping Socio-Spatial Relations in the Urban Built Environment through Time: Describing the Socio-Spatial Significance of Inhabiting Urban Form," 54-7.
developed to better foster successful interventions mounted by the city government, connecting resources and representation to the existing efforts and adaptations made by the villages. This paper suggests finding ways to connecting these kinds of placemaking efforts to resources.

On a global scale, this research urges International Development organizations to take precautions to avoid the tyranny of Big Data in driving projects. However, if designed with community planning in mind, placemaking can also serve to facilitate the collection of both qualitative and quantitative data for influencing key policy. Of course, designing places must not be the only intervention mounted by municipalities, however that consideration is not relevant to the topics of this research.
Acknowledgments

I would like to give a huge thanks to The College of William & Mary, The Roy R. Charles Center, and all of those on my examining committee – including Dr. Tomoko Hamada-Connolly, Dr. David P. Aday, and Dr. Robert A. Rose – for facilitating the complicated logistics of this entire project. I would also like to thank Andrew Cockram, Bryan Chase, Kate Zmich, Timothy Filbert, Hoyle Wang, Christine Darbyshire, Gerald Mitchell, Maggie Jones, Mikal Britt, Rhonda Campbell Perry, Maria Traver, The Batten Foundation, as well as Mrs. Jane P. Batten for donating to my thesis and allowing this project to take place!

I would like to thank all of the people who helped make this happen at 100 Resilient Cities, including Lauren Sorkin, HorngDar Lim, Sam Kernaghan, Alan Zhuang, and the rest of City and Practice Management Team for Asia and the Pacific. I would also like to thank the people who connected me to this amazing opportunity, including but not limited to: Anne Rasmussen, Dan Millison, Samuel Tumiwa, and Dr. Devisari Tunas.

My most important thank you goes out to the City Resilience Team in Semarang and Kolektif Hysteria, and the Village of Kemijen. These people include, but are not limited to: Pak Purnomo Dwi Sasonko, Mas Ahmad ‘Adin’ Khairudin, Mas Muhammad Luthfi, Mbak Mega Anggraeni, and Ibu Wiwandari Handayani, as well as all of the wonderful friends I made along the way.

A special thank you goes to my advisor, my mentor, and my good friend Dr. Joseph L. Jones. I could not have asked for a more supportive, intelligent, and dedicated advisor – absolutely none of this could have happened without your ceaseless caring.

Last but not least, I would like to thank my family – especially my parents – and my friends for supporting me, cheering me on when the work was difficult, and putting up with me at all hours of the day and night. I am truly blessed to have had such amazing people in my life.

I do not think I can say it enough: thank you, thank you, thank you.
Notes

1. In lieu of a traditional hypothesis.
2. Regencies can essentially be considered as the Indonesian equivalent to counties.
3. There are numerous parallels between this perspective and the biosocial perspective employed by medical anthropologist Paul Farmer, as well as the ecosocial perspective of social epidemiology, often used by Nancy Krieger in her works. However unlike the biosocial and ecosocial perspectives, the biocultural perspective includes a wider biological understanding of culture – itself a form of nature – dominated by neither biology nor biomedicine. Behaviors are not seen to maximize fitness due to genetic adaptations and, conversely, culture is not above biological influence or impact. See Farmer, “An Anthropology of Structural Violence,” 30-07; “Krieger et al., “Painting a Truer Picture of US Socioeconomic and racial/ethnic Health Inequalities: The Public Health Disparities Geocoding Project,” 313; Krieger, “Putting Health Inequities on the Map: Social Epidemiology Meets medical/health Geography -- an Ecosocial Perspective,” 89-92.
4. Particularly, the connection between the urban planning and public health fields is not new; as described by Northridge & Sclar, both disciplines cropped up in response to problems of sanitation and shelter following mass industrial urbanization in the mid-19th century – afflicting the poor especially.
5. As in all of the social sciences, the capture and comparison of abstract concepts is tricky, and often imprecise and/or inaccurate. In the case of SES, most studies will resort to using one or two indicators – with varying metrics and meanings – in order to quantify it; for example, income level, educational level, occupational grade, et cetera. Monetary measures, the simplest attribute of SES, are not universal across sociodemographic groups. See Adler and Stewart, “Preface to the Biology of Disadvantage: Socioeconomic Status and Health,” 1-4.
6. Though, this research acknowledges the role of globalization and international organizations in driving urban development; see Key Findings and Discussion.
7. Coined by Foucault in various lectures, governmentality is broadly defined as the “art of government” governing, under the assumption that formal authority employs a wide range of social and biopolitical techniques.
8. To the likes of Robert Moses and Jane Jacobs.
9. Also, women make up 60 to 80 percent of the informal workforce in developing countries.
10. “Mechanical solidarity is the social integration of members of a society who have common values and beliefs. These common values and beliefs constitute a “collective conscience” that works internally in individual members to cause them to cooperate.” See The Encyclopaedia Britannica.
11. A common theme in my own data collection, this is further elaborated in the Discussion section of this paper.
12. Mainly in the Findings and Discussion sections, as it framed many of the interviews I conducted with the city’s Department leaders and other researchers.
13. 100 Resilient Cities—Pioneered by the Rockefeller Foundation (100RC) aims to help cities around the world become more resilient to “the physical, social and economic challenges that are a growing part of the 21st century.” The organization operates along four main pathways: 1) Financial and logistical guidance for establishing a Chief Resilience Officer in city government to lead the
city’s resilience efforts; 2) Support for development of a Resilience Strategy; 3) Access to solutions, service providers, and partners from the private, public and NGO sectors to aid cities in development and implementation of their Resilience Strategies; 4) Membership in a global network of partner cities to transfer knowledge. See City Resilience Framework. November 2015.

14. The individual research I conducted was considered – by myself and by the city – as being independent of my work for the municipal government, yet my experience still fed into my observations surrounding the operation of the government.

15. 100RC developed a “City Resilience Framework” that addresses this; it is grounded in “four essential dimensions of urban resilience: Health & Wellbeing; Economy & Society; Infrastructure & Environment; and Leadership & Strategy.” See City Resilience Framework. November 2015.

16. Analog or hard copy spatial data was considered to be beyond the scope of this research, due to the lack of equipment and time that digitizing large datasets would take. Property value data was given in the form of various word documents that, for the sake of time, was only processed at the sub-district level to compare two villages.

17. As I learned from discussions with Directors at 100RC, some development programs will also purchase data from private companies – namely Telecom companies – operating in the city. Typically, this source of data is extremely expensive and not considered within the feasibility of this research.

18. This name has evolved since the initiative’s inception. Originally called Peta Kota, meaning city maps in Indonesian, the official name has since changed to Peka Kota, which means sensitive city in Indonesian. Yet at times the actual collaboration between a village and the entity is also referred to by Hysteria as Penta-K Labs.

19. Many more variables were given to me, however these were the ones used in my analysis of the city.

20. This was a common platitude amongst the citizens of Semarang; truly, there is flat coastal area as well as hilly and mountainous terrain.

21. The North Semarang, West Semarang, and Mijen Subdistricts specifically.
'Questions for me:

- Park Bote: (1) purpose/goal, information,

- PUBLIC SPACE:

  - Where does the city prioritize public space.
  - PB has a study on public space in front of him, flipping through it.
  - Beautiful building on his band, "Bote Martine's Jogos." Phone, paper, doesn't look directly at me.
  - Study green public space → study "problem", in downtown.
  - Sensely populated already → priority from mayor.
  - IG each district.
  - 1 public space per year → program for recovering PS already occupied → 2017
  - Initial program changing trends → promoting PS.

- Why does public space focus in certain areas?
- Obstacles to public space: physical? Demographic? Socioeconomic?
  * Program gets its own budget next year.

- Since 2005: revitalization along Cali tramway.
- Information on the revitalization.
- DESIGN PROBLEM: how to keep the flower market + sidewalk.

- Lice: building, as physical problem, how to design PS?
  - Needs need to speak in English.
  - 2 kinds: public (minimum 20%), private from building perspective.
  - Indonesian Act requires coverage across the city.
  - Minimum for housing 40%, 60%.
  * How does space get calculated for? Obstacles.

- PB (flour voice):

Figure 1: Field Notes Example.
Figure 2: GoogleMaps compared with OpenStreetMap Data.

Figure 3: Population Density Map by Standard Deviation, Data from 2013.
Figure 4: Flood Risk Map.

Figure 5: Flood Risk Map Model.
Figure 6: Land Risk Map.

Figure 7: Land Risk Model.
Figure 8: Disaster Risk Index Map.

Calculated from equally intersecting two indices representing risk from flood and risk from land movement.

Formula for Land Risk:
A) Fault Buffer = 50, 100, 200, 500, >1500 meters
B) Land Subsidence (cm/ year) = <3, 3 - 4, 4 - 6, 6 - 8, >8
C) Ground Movement = Very Low, Low, Medium, High
D) Slope = 0 - 3%, 3 - 10%, 10 - 15%, 15 - 25%, 25 - 35%, 35 - 45%, >45%

\[(A \times 0.15) + (B \times 0.25) + (C \times 0.4) + (D \times 0.2) = \text{Land Risk}\]

Formula for Flood Risk:
A) Flooded Area Buffer = 5, 50, 100, 150, 200+ meters
B) River Buffer = 0.5, 1, 1.5, 2, 2.5 + kilometers
C) Coastal Buffer = 0.5, 1, 2, 3, 4 + kilometers

\[(A \times 0.55) + (B \times 0.2) + (C \times 0.4) = \text{Flood Risk}\]

Figure 9.1: Dengue Hemorrhagic Fever Outbreaks from 2013 to 2014.
Figure 9.2: Dengue Hemorrhagic Fever Outbreaks and Waste Levels in 2014.

Figure 9.3: Dengue Hemorrhagic Fever Outbreaks and Poverty Levels in 2014.
Figure 9.4: Dengue Hemorrhagic Fever Outbreaks (2014) with Waste and Poverty Index.

Pictures:

Figures 10.1 and 10.2: Community and Artist Collaboration.
Figure 10.2 and 10.3: Artists and Residents made infrastructural improvements where necessary, including fixing roads and installing street lights; Hysteria (2015).

Figures 10.4 and 10.5: Historical significance of the symbol of the railroad was incorporated into the central Mural in Kemijen.
Figure 10.61: Murals depicting symbols of daily village life, such as this one, were also incorporated into the installation.

Figures 10.62 and 10.63: Two murals depicting the likeness of founders and famous villagers, accompanied by a narrative telling the *kampung* story.
Figure 10.7: Children playing on the new local board game made by the artists.

Figure 10.8: ‘Green’ Space as created for the village of Kemijen.
Figure 10.9: An indoor ‘playground’ for the children of Kemijen, filled with toys that the children made themselves in a workshop.

Figures 11.1 and 11.2: Images constructed by the artists to imagine what the empty space could look like, with accompanying text asking villagers to muse on what they would like to see.
Figure 12: A picture of the simple mural map I developed for and painted – in collaboration with an artist – in Kemijen.
Citations


Punch, Kevin F. and Alis Oancea. 2015. Introduction to Research Methods in Education. 2nd ed. SAGE Publications Ltd.


