CASE 8 GREATER THAN PARTS

Semarang, Indonesia

Clustering and Connecting Locally Championed Metropolitan Solutions

Wiwandari Handayani, Rukuh Setiadi, Bintang Septiarani, and Lincoln Lewis

WORLD BANK GROUP

Editors
Shagun Mehrotra, Lincoln Lewis,
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Cover design: Oliver Uberti
Typesetting: Puntoaparte

Disclaimer—The report contains preliminary research, analysis, findings, and recommendations. The information is circulated to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues.

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CASE STUDY 8: METROPOLITAN SEMARANG

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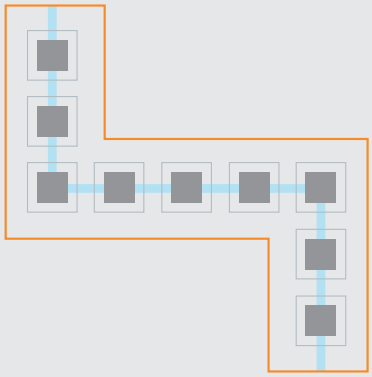

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The Synthesis Report offers a range of integrated solutions (Mehrotra 2020).

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THE SOLUTION

Clustering and connecting locally championed metropolitan solutions

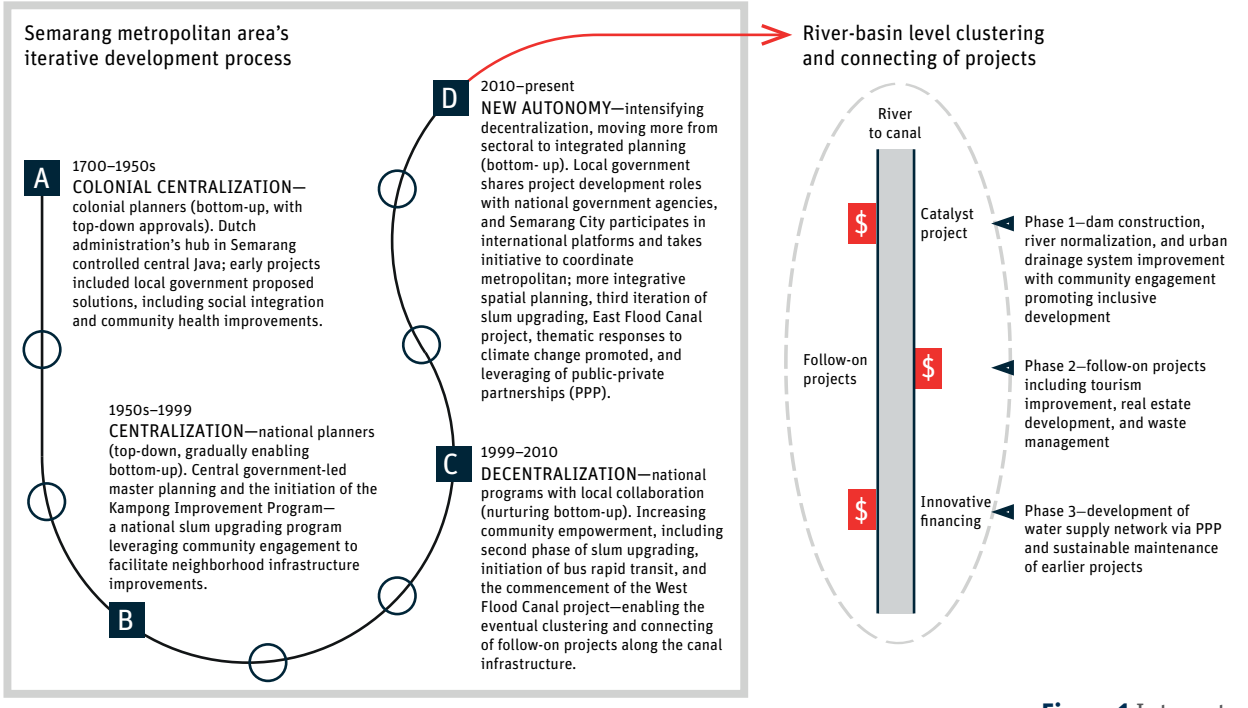


Figure 1 Integrated planning model

Source: Mehrotra 2020, with input from Lincoln Lewis.

KEY FINDINGS

1 Semarang City is taking an active role in international city networks and bolstering appreciation for the interconnectedness of challenges like climate change and traffic congestion, while promoting social inclusion through the mayor's initiative "Moving Together". This momentum is incrementally encouraging greater cross-sectoral integration.

2 A water resource and flood management project was proposed by Semarang City at its West Flood Canal after devastating floods in the 1990s. The project's long-term sustainability was increased due to involvement of the local community and the later identification of clear maintenance responsibilities between government agencies.

3 Clustering and connecting projects along the West Flood Canal has generated higher environmental benefits than any single project could. The success is demonstrated by key elements of the work being replicated at the city's East Flood Canal.

IDEA IN BRIEF

Cities can opportunistically cluster urban regeneration and greenfield projects in phases along major linear infrastructure projects that connect commercial opportunities with environmentally beneficial and socially inclusive development.

Semarang metropolitan area comprises the primate Semarang City and five surrounding other local governments. The case study provides an example of how linear infrastructure development—flood canals—can catalyze follow-on development. Semarang's urban policymakers seized the West Flood Canal project to cluster multi-sectoral and cross-jurisdictional solutions around the infrastructure. Over time the project has connected revenue-generating activities, such as tourism and real estate development, with river normalization, dam construction, and urban drainage improvement components along with social inclusion initiatives. Innovative financing methods have propelled the follow-on projects, such as a public-private partnership for the area's water supply network. Elements of this innovation have been replicated in Semarang along the East Flood Canal.

Such approaches offer urban policymakers opportunities to mobilize financing as well as engage a broader community of national and local government, private-sector, and community actors. Over the longer arc of time, Semarang's experience indicates that gradual decentralization has expanded the opportunities for bottom-up metropolitan-led integrated solutions, opening space for private and community action.

Figure 2
Sectors addressed by the case; also including urban regeneration and slum upgrading.

The Metropolitan Context

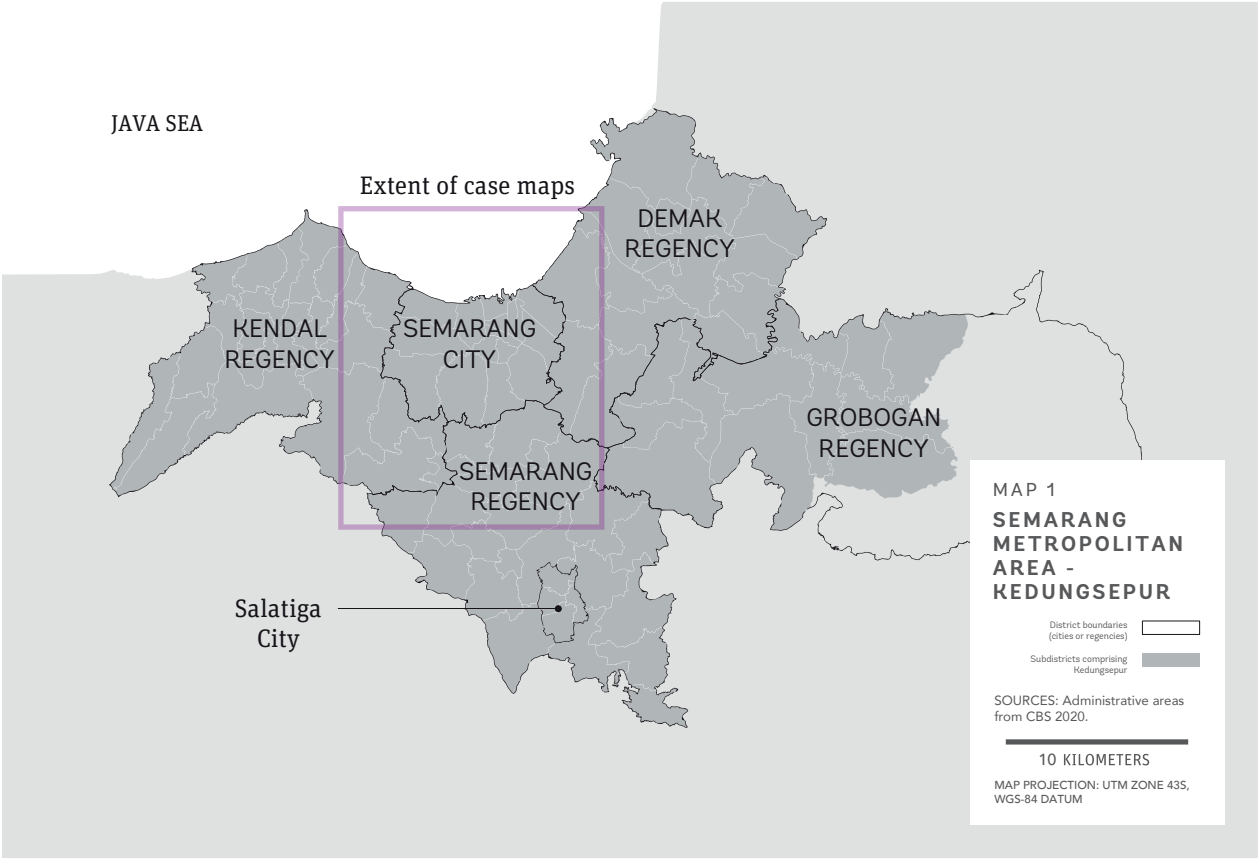
BACKGROUND

SEMARANG LIES ALONG THE NORTH COAST of Indonesia's Java Island in a unique low-lying area that gradually rises toward the surrounding hills. The area's location at the mouth of a large, fertile river catchment provided geographic advantages to the initial settlement. The locational benefits later brought Semarang to prominence as an important Dutch colonial city, strategically sitting halfway between DKI Jakarta[1] and Surabaya, that enabled control over much of inner Java's agricultural production and commerce.

In the present day, Semarang City retains its importance and is the capital and most populated city of Indonesia's Central Java Province. The primate city and surrounding administrative areas make up an area of approximately 4,300 square kilometers. This area is colloquially known by the portmanteau *Kedungsepur*, referring to the metropolitan conglomeration with Semarang City at its core, surrounded by the administrative areas of Kendal Regency, Demak Regency, Ungaran (Semarang Regency), Salatiga City, and Puwodadi (some subdistricts of Grobogan Regency). This area is shown in Map 1.

The fact that Semarang City is closely connected physically and socioeconomically to the surrounding administrative areas has positioned the greater area as one of the most important metropolitan regions of Indonesia. Due to this national importance and the challenges the urban area is experiencing, Presidential Decree 78 of 2017 made the Semarang metropolitan area a National Strategic Area in the Indonesian government's National Spatial Plan (2008–2028) and defined the area of Kedungsepur.

[1] Jakarta Metropolitan Area, Daerah Khusus Ibukota Jakarta.

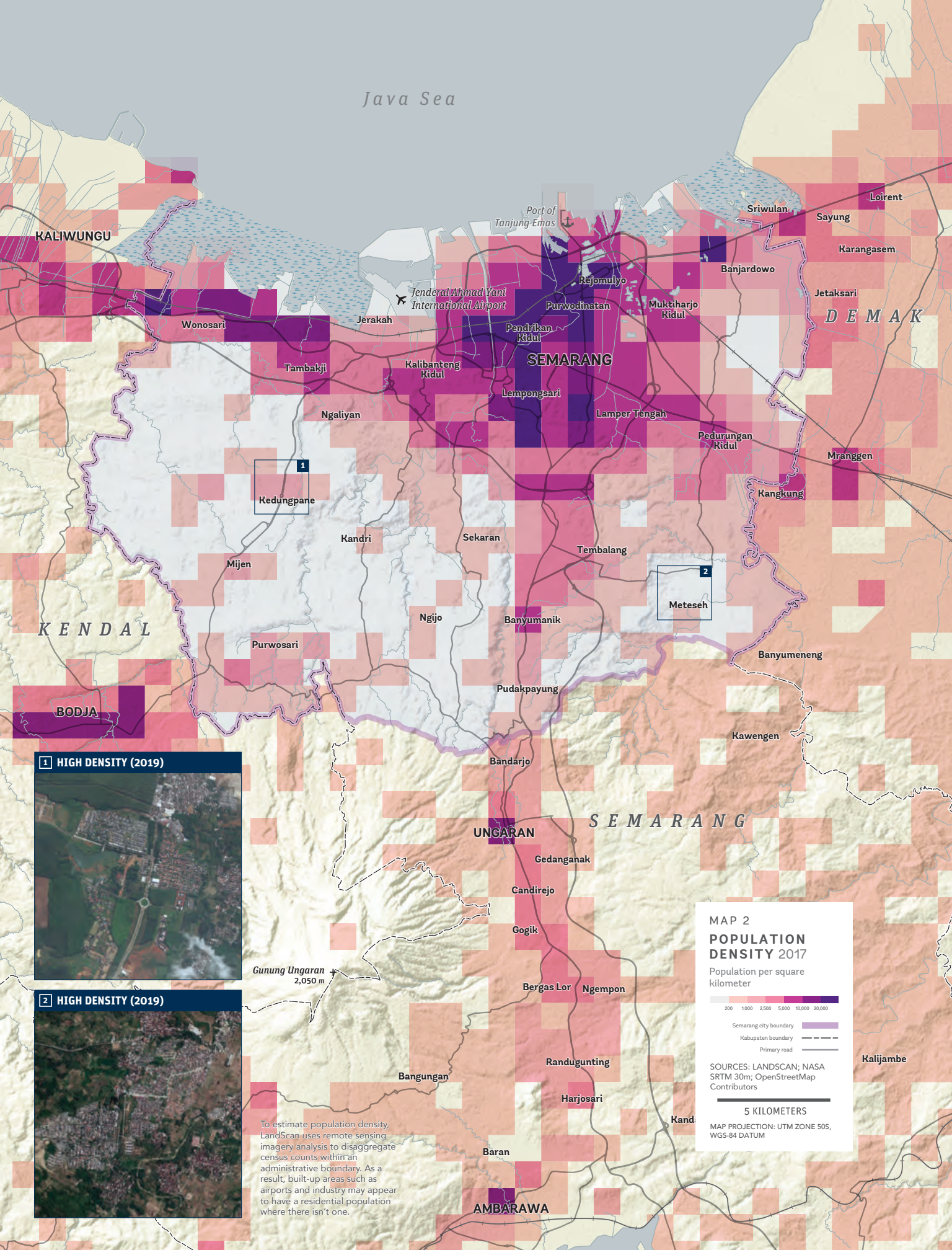


In 2018, Semarang City had a population of 1.7 million people with an annual growth rate of approximately 3 percent and a population density of 4,650 people/km². The total population of Semarang metropolitan area was 5.7 million people with a population density of approximately 1,350 people/km². Approximately 27 percent of the population lives in Semarang City (CBS of Semarang City 2018). Based on Indonesia's Law No. 26 of 2007, which classifies a "metropolitan area" as having a population greater than 1 million, Semarang City itself could be defined as a metropolitan area.

Looking at Indonesia as a whole, 56 percent of the population – or 151 million individuals – lived in urban areas in 2018 (UNDESA 2018) and by 2045 it's anticipated that 70 percent will be urban (Roberts, Gil Sander, and Tiwari 2019). Semarang is the fifth largest metropolitan area on Java Island, and the sixth most populous in Indonesia, following DKI Jakarta, Bandung, Medan, Surabaya, and Surakarta. Within this urban development context, Semarang has taken a key role by participating in several initiatives, which are elaborated in Box 1.

27%

Semarang City's population as part of the Semarang metropolitan area


Java Sea
Port of Tanjung Emas
Jenderal Ahmad Yani International Airport
KALIWUNGU
Wonosari
Jerakah
Tambakji
Kalibanteng Kidul
Ngaliyan
Pendrikan Kidul
Purwodinatan
Rejomulyo
Muktiharjo Kidul
Lempongsari
Lamper Tengah
SEMARANG
Sriwulan
Loirent
Sayung
Karangasem
Banjardowo
Jetaksari
DEMAK
Pedurungan Kidul
Mranggen
Kangkung
1
Kedungpane
Kandri
Sekaran
Tembalang
Mijen
2
Meteseh
KENDAL
Ngijo
Banyumanik
Purwosari
Banyumeneng
Pudakpayung
BODJA
Kawengen
Bandarjo
SEMARANG
UNGARAN
Gedanganak
Candirejo
Gogik
Gunung Ungaran
2,050 m
Bergas Lor
Ngempon
Randugunting
Kalijambe
Bangungan
Harjosari
Baran
AMBARAWA
1 HIGH DENSITY (2019)
2 HIGH DENSITY (2019)
MAP 2
POPULATION DENSITY 2017
Population per square kilometer
200
1,000
2,500
5,000
10,000
20,000
Semarang city boundary
Kabupaten boundary
Primary road
SOURCES: LANDSCAN; NASA SRTM 30m; OpenStreetMap Contributors
5 KILOMETERS
MAP PROJECTION: UTM ZONE 50S, WGS-84 DATUM
To estimate population density, LandScan uses remote sensing imagery analysis to disaggregate census counts within an administrative boundary. As a result, built-up areas such as airports and industry may appear to have a residential population where there isn't one.

BOX 1. SEMARANG IN INDONESIA'S URBAN DEVELOPMENT CONTEXT

Semarang is at the leading edge of advancing Indonesia's urban development in terms of urban planning processes, analytics, and financing initiatives.

Many Indonesian local governments are unfamiliar with systematic data collection and sharing, and have limited infrastructure to process, manage, and host data. To assist these cities in strengthening their data capacity to leverage urbanization's benefits, the City Planning Labs (CPL) program was established by the World Bank and funded by the Indonesia Sustainable Urbanization Trust Fund (World Bank 2016). The initiative provides technical assistance, shares international development best practices, and develops a spatial information strategy for cities that sets up processes and procedures encouraging government stakeholders to collect, share, and analyze data. It also seeks to build the capacity of staff to manage the technologies. The original CPL locations were in Semarang and Denpasar (Bali) (Singh, Raghupathy, and Volosin 2017).

In Semarang, the program recently developed a suitability tool to identify optimal affordable housing locations by carrying out more than 600 observations of commercial land values (Singh et al. 2019). Semarang's CPL team has also used data analytics to inform the city's medium-term plan. The analysis considered factors such as the city's water supply network, health centers, schools, green spaces, and poverty rates, as well as the implications of land area reduction due to subsidence. The results have allowed planners to see more clearly how the city's infrastructure gaps relate to issues such as poverty and the physical challenges of coastal land subsidence (World Bank 2016). Although the analysis was done for Semarang, the method used offers wider benefits when it is shared with other cities and informs their integrated planning processes. The scale-up of the CPL program will enable Indonesian cities to address the challenges that urbanization presents and to take advantage of the opportunities it offers.

CPL is a component of another initiative in which Semarang plays a key role. Indonesia's National Urban Development Project (NUDP) is envisioned by the Indonesian government as a collaboration platform for coordinating urban planning and infrastructure development across various national sectoral programs. Semarang City is slated to be one of the beneficiaries of the project, which will support the development of capacity for making informed, sectorally integrated, and prioritized capital investment decisions. The project is supported by the World Bank and will enhance Indonesian cities' ability to access alternative sources of financing in the long term (World Bank 2019).

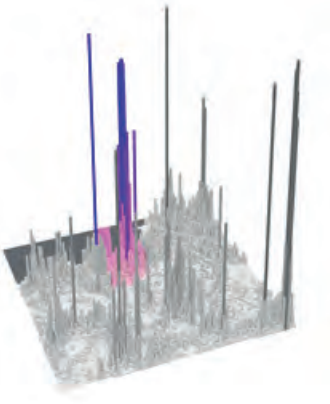


Figure 3
3D population density distribution

Over time the Semarang metropolitan region's geography has influenced the direction of its urban development growth. Development has foremost been concentrated southward along the corridor that connects Semarang City's port to the region's hinterland of inner Java, colloquially named *Joglosemar*, a portmanteau of Jogja, Solo, and Semarang (the first two jurisdictions referring to the formal names of the important cities Yogyakarta and Surakarta respectively). This development pattern along the main transportation corridor southward to these important cities is seen in Map 3.

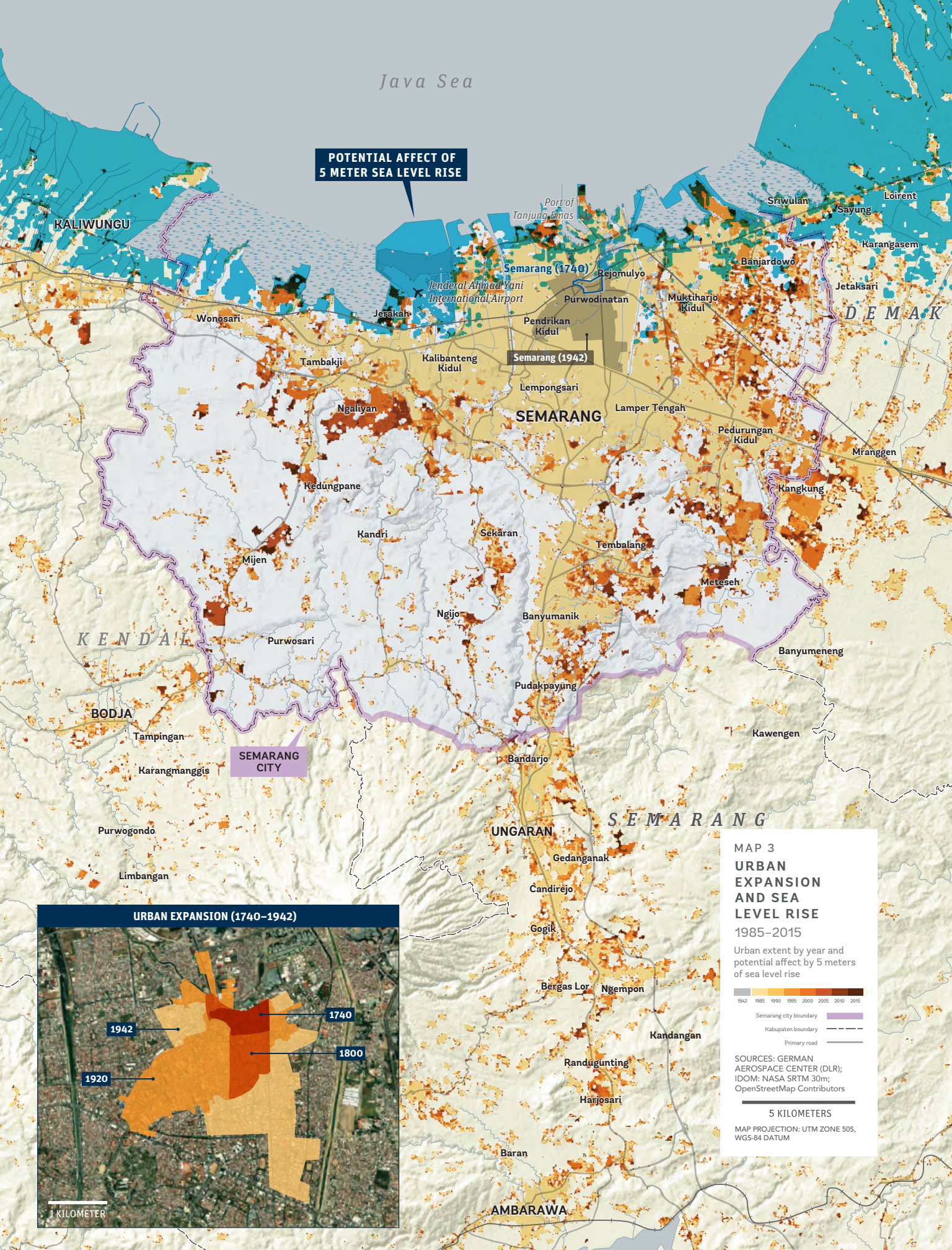
Large residential developments and industries are located in the metropolitan's south along with higher education facilities. The establishment of a north–south toll road has facilitated this southward urban growth. The latest urban expansion towards the south-west, which converts a significant amount of productive agricultural land and forested area, occurred in the last two decades due to the development of Bukit Semarang Baru (BSB) City and many other smaller residential developments.

The metropolitan's peripheral west and east have also grown rapidly with industries and warehouses, mainly due to their proximity to Java's east–west North Coast Road. Urban residential expansion towards the south-east of the city is also significant due to the relatively flat topography of the area.

From the north, increasing environmental impacts along the Java coast have also influenced the Semarang metropolitan area's growth pattern. Challenges such as land subsidence, tidal flooding, and environmental degradation have had increasing effects. These effects have foregrounded concerns about Semarang's climate resilience and raised awareness that more needs to be done. A toll road is currently being constructed along the coast to combat sea level rise, while also offering the benefit of traffic congestion management. Map 3 shows the affects of sea level rise on the Semarang metropolitan area's urban footprint.

During this metropolitan growth, Semarang City has raised its attention to informal housing, since environmental impacts can disproportionally affect those who are in greatest need. Mayoral Decree No. 050/801 in 2014 classified almost 416 hectares of Semarang City as slum areas. This meant that approximately 110,000 people, or 6.4 percent of the total population of Semarang, were living in a slum. As for other economic and development indicators, the current unemployment rate in Semarang is approximately 6.6 percent and the literacy rate (for ages 15 years and above) is high at 97.9 percent (CBS of Semarang City 2018). In 2016 GDP per capita was $6,360[2] (CBS of Semarang City 2017) as cited by the mayor in his decree No. 11, 2017 regarding medium-term development plans.

[2] Here and throughout this chapter, all dollar amounts refer to US dollars.


Java Sea
POTENTIAL AFFECT OF 5 METER SEA LEVEL RISE
KALIWUNGU
Port of Tanjung Emas
Sriwulan
Sayung
Loirent
Karangasem
Banjardowo
Jetaksari
Semarang (1740)
Rejomulyo
Jenderal Ahmad Yani International Airport
Purwodinatan
Muktiharjo Kidul
DEMAK
Wonosari
Jerakah
Pendrikan Kidul
Tambakji
Kalibanteng Kidul
Semarang (1942)
Lempongsari
Ngaliyan
SEMARANG
Lamper Tengah
Pedurungan Kidul
Mranggen
Kedungpane
Kangkung
Kandri
Sekaran
Tembalang
Mijen
Meteseh
Ngijo
Banyumanik
KENDAL
Purwosari
Banyumeneng
Pudakpayung
BODJA
Tampingan
Kawengen
SEMARANG CITY
Karangmanggis
Bandarjo
SEMARANG
Purwogondo
UNGARAN
Gedanganak
Limbangan
Candirejo
Gogik
Bergas Lor
Ngempon
Kandangan
Randugunting
Harjosari
Baran
AMBARAWA
URBAN EXPANSION (1740–1942)
1740
1942
1800
1920
1 KILOMETER
MAP 3
URBAN EXPANSION AND SEA LEVEL RISE
1985–2015
Urban extent by year and potential affect by 5 meters of sea level rise
1942 1985 1990 1995 2000 2005 2010 2015
Semarang city boundary
Kabupaten boundary
Primary road
SOURCES: GERMAN AEROSPACE CENTER (DLR); IDOM: NASA SRTM 30m; OpenStreetMap Contributors
5 KILOMETERS
MAP PROJECTION: UTM ZONE 50S, WGS-84 DATUM

URBAN INNOVATIONS

Semarang's integrated metropolitan planning methods over time present several urban innovations that others can learn from. These innovations show how the local level functions within the national and provincial policy frameworks, how strategic sectoral issues can be approached, and how traditional sectorial innovations have become wider, more integrated, and implemented in phased approaches to achieve greater gains.

The examples primarily focus on the areas of multi-sectoral coordination, disaster risk management, slum upgrading and affordable housing, public transportation, and water resource and flood management. These innovations are – importantly – proposed and developed by different government entities with different sources of funding. Some of the approaches that are explained later were developed as national programs by the Indonesian national government and have been implemented in different forms in other cities. A summary of the innovations is shown in Table 1.

TABLE 1. URBAN INNOVATIONS

SOLUTIONS	MECHANISM	DESCRIPTION	CASE
Multi-sectoral coordination	Kedungsepur Memorandum of Understanding (MOU)	Agreement that promotes horizontal collaboration among six heads of local government (Semarang City's mayor and five regents of the surrounding areas)	Kedungsepur (2010s–present)
Disaster risk management	Disaster Mitigation Collaboration Agreement	Operationalizing the Kedungsepur MOU; provides disaster mitigation collaboration by the head of the disaster management boards of the six jurisdictions	Kedungsepur (2010s–present)
Slum upgrading	New Neighborhood Development Program	Equipping developments with proper road access, sanitation facilities, and sewer service while linking them with surrounding kampongs or villages	Indonesia (Semarang 1910s–1920s)
	Kampong Improvement Program (KIP)	Allocation of government budget through community participation to equip households with a water connection, sanitation, sewer, flooring, path/road	Indonesia (Semarang 1970–1990s)
	Connecting KIP to regional infrastructure projects	Synergize the implementation of kampong improvement initiatives with a larger government investment plan in regional infrastructure	Indonesia (Semarang 1990s–2000)
	Connecting KIP and revolving funds	Investing government budget in productive activities at the community level to improve community income and sustain participatory-based maintenance of kampong facilities	Indonesia (Semarang 2000–2015)

TABLE 1. URBAN INNOVATIONS

SOLUTIONS	MECHANISM	DESCRIPTION	CASE
Affordable Housing	Establish public housing corporations	To assist the central government in building a large number of low-cost housing units for low income groups with a long-term planning scheme	Indonesia (Semarang 1980s)
	Golden rule "1-4-6" for private real estate developers	For every single premium house development, one building permit would be released if the developer agreed to build at least four medium-cost and six low-cost houses	Indonesia (Semarang 1990s)
	Public rental flats	Share of budget and responsibilities to develop vertical housing for rent with an affordable price, while establishing institution to collect rent and perform maintenance	Indonesia (Semarang 2000s–present)
	State financial instrument for housing development	A state financial instrument Perseroan Terbatas Sarana Multigriya Finansial (PT. SMF) serves as a secondary financial market to fund private developers, with lower interest rates than primary financial institutions (conventional banks)	Indonesia, (2000s–present)
Transportation Infrastructure	Connect public transport corridor to public rental flats	Support public rental flats as a viable option for low-income groups	Indonesia (Semarang 2000s–present)
	Agreement for public transportation stops in periphery jurisdictions	Operationalizing the Kedungsepur MOU; provides commuters with affordable public transportation options, while reducing traffic congestion	Kedungsepur (2010s–present)
	Tanggul Laut toll road	Create a toll road embankment to increase connectivity and counteract sea level rise and urban flooding	Semarang (2010s–present)
Water resource and flood management	Semarang West Flood Canal development, comprising Garang River normalization, Jatibarang Dam construction, and improvement of the urban drainage system	Implemented cross-sectoral integration including infrastructural works and community empowerment, along with cross-jurisdiction between national and local administrations. Started in the 1990s due to two large floods and completed in 2014; follow-on activities continue (tourism improvement, real estate development, and waste management); project has been replicated at Semarang's East Flood Canal.	Indonesia (Semarang 1990s–2010s)
	Mandatory construction by real estate developers of a water retention pond for developments greater than 5 hectares	To improve urban flood resilience and reduce the burden on local storm water management infrastructure	Indonesia (Semarang 2010s-present)

Integration

HOW INTEGRATED PLANNING IS DEFINED AND ADOPTED

SCARSE AND SHEATE (2002) outline various meanings of integration, from the integration of actors to authorities; from the integration of data to process; and many other types of integration, such as mainstreaming. Despite the urgency to consider all of these kinds of integration, spatial and sectoral integration serve as two fundamental types of integration that are equally important and most relevant to this case study.

Actors in Semarang City define the integration of metropolitan planning as a chaotic but harmonious process involving different arrays of government actors in various sectors. This definition reflects sectoral integration, particularly in regard to process, in which the city actors perceive integration as harmonization of individual agency-based initiatives and actions. It also includes harmonization of initiatives and actions across levels of government.

The way actors in Semarang define integration is closer to the notion of bounded-incremental rationality (Simon 1972; Lindblom 1979), than that of linear rationality (Banfield 1959). However, spatial and sectoral integrations in the city have been overshadowed by the dynamic effects of Indonesia's decentralization, which has made both spatial and sectoral integrations more difficult. The distribution of authority has dominated the decentralization narrative in the country over the last two decades. Therefore, the harmonization process to accomplish a shared objective or an integrated vision in Semarang metropolitan area is also affected by jurisdiction and authority constraints.

Another definition of integration involves a clear goal and an iterative strategy, allowing the process to result in optimal outcomes and sustainable solutions that work for both the city and greater metropolitan area. From this perspective the idea of spatial integration has emerged. The territorial boundary of a planning program or project often expands when following this iterative goal by utilizing visioning exercises and implementation strategies.

Integration in Semarang metropolitan area is a gradual process rather than a sudden change. For example, integrative solutions for dealing with housing and slums have been evolving since the early 1920s (Box 2).. The same applies to water and flood management, which began in the 1990s through the Jatibarang Dam development program and continues through the clustering of follow-on projects. As time goes by, urban flood management also integrates other urban development goals, such as in the provision of clean water, which boosts urban tourism and at the same time influences placemaking.

Cross-sectoral integration over the last decade can also be seen in initiatives countering the effects of sea level rise, urban flooding, and traffic congestion management. The integrated adaptation solution was developed as a sea wall project that also serves as a toll road connecting Semarang and Demak. Through this example of clustering solutions, Semarang metropolitan area shows that a coordinated context-specific instigation can be developed as a solution to multiple challenges.

PROCESSES, ACTORS, AND IMPLEMENTATION MECHANISMS

Implementation of integrated urban planning in metropolitan Semarang has been challenging; not only because it involves different stakeholders and government at various levels, but also because it includes various sectors with substantial underlying issues. Lessons can be learned from analyzing different development stakeholders' roles and responsibilities, the initiation process of projects, and the history and different generations of urban development solutions.

The metropolitan that comprises Semarang as the primate city and its surrounding administrative areas is under the authority of local governments who must also coordinate with the provincial and national governments. In addition to the multiple levels of government stakeholders, there are also private sector stakeholders, nongovernmental organizations (NGOs), and local institutions that have been making important contributions and play a significant role in Semarang's development processes.

Most importantly, there is currently not a particular body within the government structure responsible for the implementation of Semarang's metropolitan development. All development implementation in the metropolitan area is executed by each jurisdiction's relevant agencies, based on their role and authority. Agency authority is dictated by the regulations of Indonesia's Organizational Structure and Work Procedure (SOTK). Indonesia's governance is divided into four levels: national, provincial, local (district), and community (subdistrict).

The institutions responsible for coordinating integrated development are the development planning agencies at three different levels. There is the Ministry of National Development Planning of the Republic of Indonesia (BAPPENAS) at the national level, the Regional Development Planning Agency (BAPPEDA) of Central Java Province at the provincial level, and the BAPPEDA at the district level. When it comes to cooperation between two or more local governments

in a particular sector, the administrative arrangement of the cooperation is coordinated by the Bureau of Government, Regional Autonomy and Cooperation under the secretariat office of Central Java Province. This bureau is also closely connected to the national Ministry of Internal Affairs for coordination with the national-level government. However, this arrangement does not always work in implementation. The provincial government has some limitations as a coordinator at the regional level, mainly because of complications that arise due to SOTK and budgeting guidelines.

Working within such considerations, strong government action has initiated the coordination of development programs. The establishment of Law No. 23, 2014 on Local Government Authority has transferred important coordination roles from both the national and provincial levels to the local level. Together with these decentralization efforts, there is a critical issue of capacity gaps managing metropolitan areas where there are still significant capacity gaps (a financial gap and limited human-resource capacity) between the government of the urban center (i.e. Semarang City) and the government of the surrounding administrative areas. Meanwhile, as stated earlier, the authority of the provincial government is very limited due to the regulations of SOTK.

While the government facilitates the integration process by providing relevant policy instruments (rules and regulations) and strategic public infrastructure, the private sector actors do most of the development. Developers have also a responsibility for the provision of infrastructure in the area that they develop. Most of the high-value land within the Semarang metropolitan area is owned by the private sector. Accordingly, the infrastructure development process for the construction of a satellite city, industrial park, or the erection of a new apartment building is mostly determined by the private developers/land owners involved. It is a challenge for the government to control the development due to the lack of strict control mechanisms, or insufficient detail in relevant policy instruments.

Communities have also been playing an important role in Semarang's metropolitan development. One of the important missions is to improve the environment and to ensure the provision of basic public infrastructure in the emerging slum and squatter settlements. Under the flagship National Program for Community Empowerment (PNPM), a local institution at the subdistrict level called Urban Village Empowerment Institution (LPMK) was established in 2007. In Semarang, there is another related initiative, introduced in 2015 under the National Slum Upgrading Program (NSUP), which is commonly referred to in Indonesia as the KOTAKU program (Kota Tanpa Kumuh, or Cities Without Slums). With the support of KOTAKU, the local institution Community Self-Help Group (BKM) was also established at the subdistrict level in 2015. These two initiatives at the community level aim to perform as a platform for communication and coordination among communities as well as between communities and

local government. Most importantly, LPMK and BKM are also expected to act as the agents of change to sustain many initiatives on community empowerment and the basic infrastructure fulfillment program. These two institutions have also a further strategic role to ensure that marginal actors (i.e. people who live in the slum area) are able to contribute actively in the development process.

In line with the Semarang City mayor's tagline "Moving Together", there has been a strong transition towards a more inclusive development process in metropolitan Semarang. Even though it is still limited to Semarang City, some initiatives have been set up to build a coalition between the city's government and stakeholders from surrounding jurisdictions. For example, the mayor of Semarang has initiated a platform to involve local experts by forming a Semarang Advisory Board in 2015. The board consists of experts from various fields who advise the mayor on strategic urban issues. There are also corporate social responsibility initiatives and green community forums to connect government with private stakeholders and local communities.

Unfortunately, only one forum exists at the regional level to promote community-based disaster preparedness action: the Garang River Basin Forum. Initiated by the Greater Basin Territory Center (BBWS) in coordination with the Central Java Province and Semarang disaster management agencies, the forum was created in 2018 and consists of various stakeholders (local community, government representatives, local NGO, and academics). It is expected that the forum may be able to synchronize programs/initiatives from the Garang River's upstream areas to the downstream areas, which crossed two different jurisdictions (Semarang City and Semarang Regency).

Speaking to the initiation of projects, an integrated development project may be started from any level of government. For example, the toll road development on the northern coast of Java Island is purely top-down; that is, the development initiative comes from the national level. It was initiated by President Jokowi in his first presidential period (2014–2019) to promote connections between cities along the northern coastline. The project is regarded as a national policy as its budgeting is under the responsibility of the national government; accordingly, the governments at the local level affected by the construction should adjust their development/masterplan to maximize the benefit of the improved accessibility brought by the toll road.

In general, implementation of integrated projects in the metropolitan area follows agencies' authorities and jurisdictions, based upon either bottom-up or top-down initiatives. The term "bottom-up initiative" refers to projects or programs proposed by local government, although their funding and a major portion of implementation belong to the national government. In contrast, a "top-down initiative" refers to projects or programs that are proposed, funded, and implemented by the national government.

While considering the current roles and responsibilities of stakeholders in the development process, reviewing the different generations of urban development solutions that have contributed to the distribution of roles in Semarang metropolitan area provides important lessons.

The first generation of urban development during Semarang's colonial period shows that innovative solutions towards more integrated planning involved various development actors through early consultation and bottom-up initiatives. In dealing with housing and upgrading of slums, for example, a concern or need was raised by stakeholders to the city council (e.g. local politicians, local business elites). This was typically supported by local professionals and practitioners (e.g. doctors, scientists, architects, and urban planners) to convince the decentralization adviser and local council that action needed to be taken. Later, after a solution to the concern was devised and plans agreed by the stakeholders (e.g. *kampong* or village improvement, new neighborhood development, municipal public housing), the city council persuaded the Dutch colonial central government to provide funding.

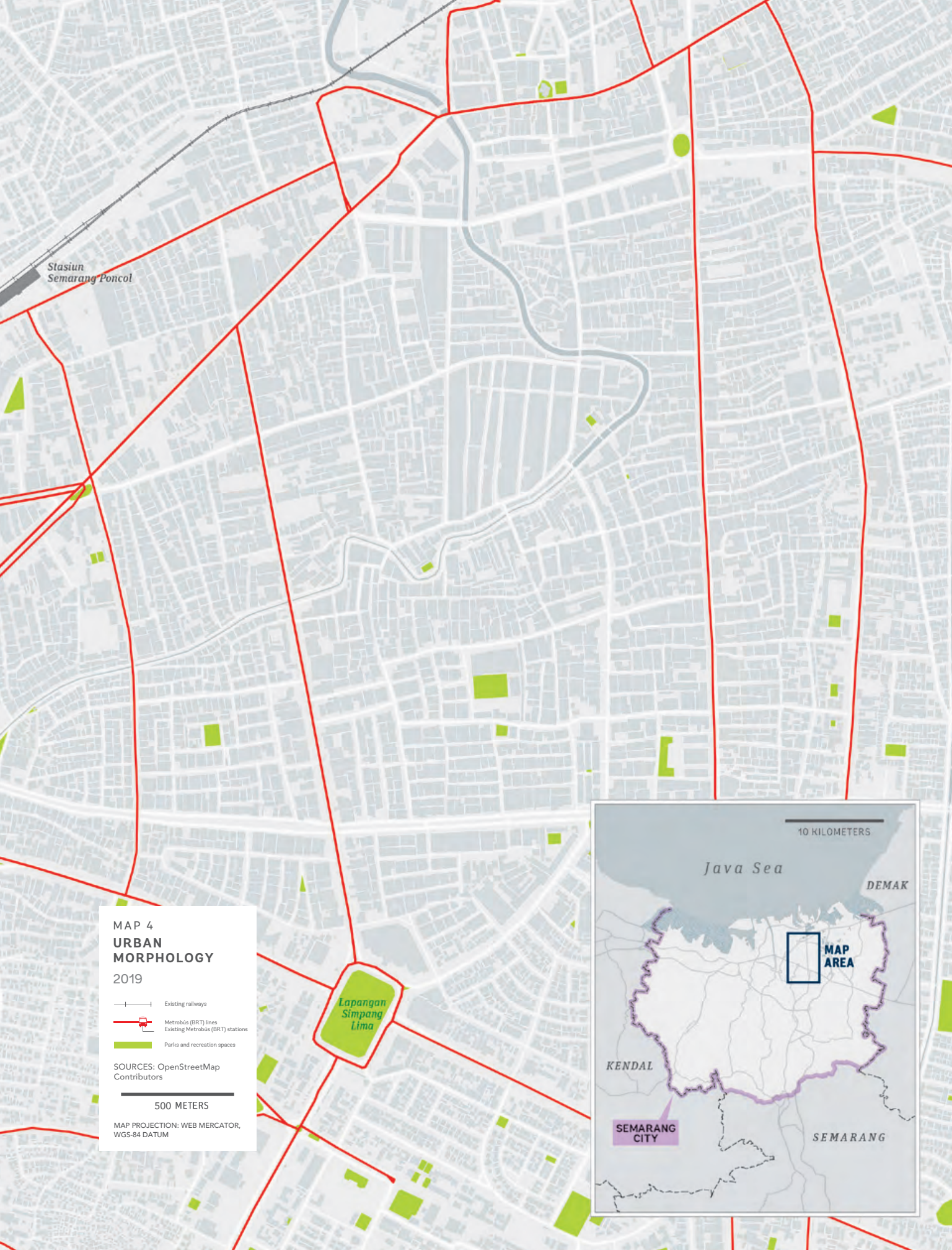
The first generation of urban development during Semarang's colonial period shows that innovative solutions towards more integrated planning involved various development actors through early consultation and bottom-up initiatives. Later, after a solution to the concern was devised and plans agreed by the stakeholders, the city council persuaded the Dutch colonial central government to provide funding.

Once funding was obtained, the execution of the plan was handled by the city council, under agencies that held specific authorities (e.g. the municipal housing corporation). Such implementation was also supported by third parties (e.g. surveyors, construction companies, housing developers, operations, and maintenance staff). The council oversaw the functioning of the program and ensured its long-term sustainability. The outcomes of Semarang's first generation of urban development can be seen in Map 5.

Semarang's urban development in the 1800s took place in the old city which was the Dutch administration's center. The Dutch in 1904 started construction of the Dutch East Indies Railroad Company headquarters in Lawang Sewu area. In 1914, Thomas Karsten arrived to Semarang and planned new neighbourhoods, such as the Niew Tjandi District. Semarang's city square (Simpang Lima) was developed at the end of 1960s. Since the 1980s, development in the Semarang City's center has been concentrated in and around the golden triangle area--stretching between Simpang Lima, Lawang Sewu, and the old city.

Semarang's later generations of urban development utilized integrated planning strategies to deal with housing and slum-upgrading concerns; there was a similar consultative process, but a more diverse range of actors and mechanisms were involved. Examples of this include combining the Kampong Improvement Program (KIP) with regional infrastructure investment under the flagship program National Program for Integrated Urban Infrastructure Development (IUIDP) and a revolving fund under PNPM.

In the project preparation stage the national government, through BAPPENAS and the Ministry of Finance, focused on the funding, which was mainly assisted by the World Bank. Legislative or parliament members were involved at the



MAP 4

URBAN MORPHOLOGY

2019

Existing railways

Metrobús (BRT) lines
Existing Metrobús (BRT) stations

Parks and recreation spaces

SOURCES: OpenStreetMap Contributors

500 METERS

MAP PROJECTION: WEB MERCATOR, WGS-84 DATUM

national level to assess the role of the national government and financial commitment. The Public Works Department coordinated activities at the national level, while agencies at the local level coordinated the implementation of each project.

The program included a selection of prioritized or targeted neighborhoods and communities. As the second and third generation of kampong improvement for the poor and those who are vulnerable due to the economic crisis, the community's involvement was extensive. The city thus did not only improve the neighborhood *for* the poor, but also *with* the poor. Experts (e.g. urban planners, sociologists, economists) were specifically hired as local facilitators to build engagement with the program's beneficiaries in the community. Engineering consultants and academics were involved in the technical and physical implementation. This arrangement made for an important new view, in the eyes of the Indonesian public, of the role of urban planners. Urban planners subsequently do not only ensure the alignment and connectivity of regional infrastructure systems with neighborhoods, but also facilitate the stakeholder empowerment process at the community level.

A national legal framework in Indonesia has been the main tool for both sectoral and spatial integration at the metropolitan scale.

An example of another bottom-up approach is the integrated water resources and flood management project in Semarang's West Flood Canal (Garang River basin). The initiative for this project came from Semarang City as a response to the devastating floods of 1990 and 1993. The city proposed the project to the national government. BBWS now acts as the most responsible actor in the implementation phase for the Garang River basin.

Despite the coordinating agencies BAPPENAS and BAPPEDA, integrated urban planning actors may vary between sectors because implementation depends on the responsible technical agencies involved. Again taking Semarang's West Flood Canal development as an example, apart from the key role of BBWS, strong vertical (national–provincial–local) and horizontal cross-jurisdictional coordination was necessary. This is because the river along its entire course being under a national authority, but the land use, sanitation, drainage systems, and other related elements within the ecological system along the river are under provincial and/or local government authority.

TOOLS AND SECTORS INVOLVED

A national legal framework in Indonesia has been the main tool for both sectoral and spatial integration at the metropolitan scale. Law No. 25, 2004 requires local governments, both at provincial and local levels, to have a long-term development plan spanning 20 years. Long-term visions are outlined in the planning document and regional strategies are proposed to achieve them. The plan then informs the creation of a district-level Medium-term Development Plan (RPJMD) spanning five years. The RPJMD reflects the vision of the elected mayor along

with socioeconomic indicators and includes targets that inform the agenda for governance, social services, infrastructure priorities, and other aspects of socioeconomic development. Also, a Local Government Work Plan is created for the short term. The RPJMD is used by government sectoral agencies to formulate their Agency Strategic Plan (Renstra OPD) and Agency Annual Development Plan (Renja OPD). This hierarchical system by design promotes cross-sector integration vertically between and horizontally across government entities.

Law No. 26, 2007 on spatial planning is also a key tool for spatial integration. The law gives privileges to the national government to assign a National Strategic Area, in which local spatial plans must accommodate and align with the strategic plan. The National Spatial Plan of Indonesia 2008–2028 mandated the Semarang metropolitan area as a National Strategic Area, which was then strengthened by Presidential Decree No. 78, 2017's determination of Kedungsepur. This decree provided a strong legal basis for local government to propose programs at a metropolitan scale.

With the involvement of various stakeholders and programs, issues are mainstreamed and influence the policy-making process (Sabatier 1999). This is especially the case during the development of the RPJMD, which has been a tool for creating integration at the local level. In Semarang City, for example, the issue of climate change was successfully integrated into the development of RPJMD 2012–2017 (Setiadi and Lo 2019); the same is the case for urban resilience mainstreaming in RPJMD 2018–2023.

Similarly at the provincial level, integrated metropolitan policies have been successfully mainstreamed in the RPJMD of Central Java Province 2018–2023. Some integrated projects at the metropolitan scale are indicated in the document, such as the reactivation of the railway from Kedungjati to Yogyakarta (the southern part of the metropolitan area); and from Semarang to Rembang (the eastern part of the metropolitan area). Another integrated project highlighted in the RPJMD document are road connections from Kendal to Ungaran and from Semarang to Grobogan.

One of the most well integrated development sectors has been water management in Semarang City's flood canal projects. Various water management projects have successfully addressed metropolitan issues such as flooding and water scarcity while creating co-benefits to other sectors, such as housing, community development, tourism, and industries. The sector has involved various actors including the national government and its regional offices, provincial government, and local government (cities and regencies), communities, regional-owned water companies, the private sector, universities, NGOs (international and local), donor agencies, and financing institutions (e.g. the World Bank and the Japan International Cooperation Agency, or JICA).

Various water management projects have successfully addressed metropolitan issues such as flooding and water scarcity while creating co-benefits to other sectors, such as housing, community development, tourism, and industries.

A growing appreciation for community empowerment and economic development is encouraging greater integration of solutions along Semarang's West Flood Canal to combat climate change and reduce inequality.

Source: Photography by Mangiwau/ Moment via Getty Images.

Implementation

INSTITUTIONAL ARCHITECTURE

THERE HAS BEEN AN IMPORTANT TRANSFORMATION in Indonesia's institutional architecture that has encouraged integrated development. From 1966 to 1999 Indonesia was in the centralized (New Order) era, but in 1999 it began the decentralized/autonomy (Reform) era. There also came into existence after the establishment of Law No. 23, 2014 a new autonomy at the local (city/regency) district level. As stated earlier, the management of the Semarang metropolitan area at present cannot be carried out by an independent body, but has to be governed in the four-level administrative structure (national–provincial–local–community). As such, collaboration is a very critical point to manage the metropolitan area as there are growing issues because of its rapid urban expansion. However to some extent, the new autonomy based on Law No. 23, 2014 has led local governments that have challenges that are horizontally or vertically overlapping with other jurisdictions to become demotivated about regional collaboration because it is, essentially, outreaching their authority.

In this context, Semarang City has been playing a strategic role in promoting horizontal collaboration throughout the metropolitan area. The mayor has stated on several occasions that he should not be active only as mayor of the city based on its administrative boundary, but also should act as a coordinator for the development of the whole metropolitan area. His commitment is actualized by the Kedungsepur MOU agreement among the area's six heads of local government (the Semarang mayor and five leaders of the surrounding areas), which was signed on April 10, 2018 (JawaPos 2018). This MOU was a very important milestone to further integrate Semarang's metropolitan development.[3]

Based upon the MOU, there have so far been two sectoral cooperation agreements signed by Semarang City and the surrounding areas. The first was on disaster mitigation collaboration between the heads of the Disaster Management Boards of Semarang City, Semarang Regency, Kendal Regency, Demak Regency, Salatiga City, and Grobogan Regency. The second cooperation agreement was for integrated public transport services collaboration by the head of the Transpor-

[3] For information regarding how the Kedungsepur MOU compares with other methods of metropolitan cooperation in Indonesia, refer to Roberts et al. 2019, p. 187.

tation Agency of Semarang City and Semarang Regency. The Semarang mayor's initiative for coordination and the two signed agreements should be regarded as critical milestones to facilitate the area's integration process. Acknowledgment of the mayor's achievement can be indicated by him having been designated as one of Asia's best mayors by the Asia Global Council in 2019.

As well as formal collaboration, informal horizontal coordination between Semarang City and the surrounding administrative areas has helped to promote integrated solutions. Inter-agency and inter-jurisdictional coordination have already been in effect, and the intensity has increased in line with the emerging cross-boundary issues, mainly because of the rapid urban expansion of Semarang metropolitan area. Most of the initiatives are led by Semarang City mainly because the city has to deal directly with various urgent urban issues that need an immediate solution at the regional level. Meetings and workshops are the two common approaches to synchronize inter-agency and inter-jurisdictional programs and initiatives. There has also been informal communication, which is most of the time regarded as a better means of communication. There is essentially no competition among the local governments, as each local government has mostly different priorities and needs. The coordination issue is more about ensuring harmony in the sense that any initiatives to fulfil particular needs initiated by one jurisdiction may not harm other jurisdictions; however, there is not yet any incentive mechanism to encourage the development of more harmonious programs among sectors and among stakeholders of different jurisdictions.

Semarang City has experience with international networks, such as being a part of the Asian Cities Climate Change Resilience Network (ACCCRN) and the former 100 Resilient Cities network, which have provided valuable momentum and self-confidence, and also a willingness for the city to be involved in wider partnerships and other platforms promoting better development implementation. Greater advantages could be leveraged if these networks and collaborations would be expanded into the wider metropolitan area.

SUSTAINABILITY

During the New Order era, under the centralized government all development initiatives were likely to be a directive from the national government. Decentralization started in 1999, followed by the launch of Law No. 23, 2014 on local government and autonomy, which reached two important milestones for further discussion on the long-term sustainability of integrated planning implementation in Indonesia.

Metaphorically speaking, the New Autonomy stage of post-independence governance, which started in 2014, has been very much like parents (the national government) giving more trust and freedom to their children (the provincial governments) and grandchildren (the local governments) to take care

of themselves. However, critical challenges have emerged around the children and grandchildren's ability to take advantage of the momentum of initiatives and sustain opportunities and tasks on their own.

As an example, to ensure water supply, run-off sustainability, and flood resilience, the Semarang City issued Government Regulation No. 7, 2014 for the Drainage Master Plan. This step forward in water policy for the city, which has also been implemented in various forums in other cities of Indonesia, states that all developments (residential and industrial) with an area of five hectares or more are required to construct at least one reservoir to provide water availability and to ensure no run-off exits their property that would contribute to flooding elsewhere.

An example of an innovative project that promotes water sustainability is the Semarang West Flood Canal (Garang River basin) integrated water resources and flood management project. As stated earlier, the initial initiative was taken by Semarang City and was to actively build intensive communication with the national government (BAPPENAS and Ministry of Public Works) in the 1990s. This was in response to the two large floods that affected Semarang in 1990 and 1993 and was first formally stated in the Semarang Spatial Planning 1995–2005 document. However, the project progressed slowly, largely because of lack of funding and authority coordination issues.

Long-term efforts to implement the project and active communication between stakeholders finally paid off when an investment project loan of $50 million was accepted from JICA in 2006. The project was executed under the coordination of BBWS with the three main components of normalizing the Garang River, constructing the Jatibarang Dam, and improving the urban drainage system.

Overall, the project has significantly promoted two forms of integration. The first is cross-sectoral integration as the focus of the project is not only the infrastructural works, but also includes community empowerment and local economic improvement for the people affected by the project. The second is cross-jurisdiction integration, as the location crosses two local administrative areas (Semarang City and Semarang Regency).

Since the project's completion in 2014, there have been some worthwhile strategies implemented to increase its long-term sustainability. Maintenance of all the infrastructural works are now under the appropriate agency according to SOTK. For example, dam operation and maintenance are under the responsibility of BBWS, while Semarang City is in charge of the drainage system. As well as the physical project outputs, community empowerment and the local economic development program also need to be sustained. Accordingly, there are ongoing negotiations between BBWS and Semarang City on distributing roles and responsibilities. BBWS is responsible for facilitating community-based environmental conservation and the local government is focused on the continuation of

economic development by working closely with residents on community-based tourism attractions in the surrounding Jatibarang area.

There have also been some follow-on activities to the project. These ongoing projects include tourism activities, real estate development, and waste management improvement. Furthermore, the sustainability of the works has expanded with the involvement of the private sector. A Public-Private Partnership (PPP) was first conceptualized in 2017 and launched in 2019 to develop an integrated water supply system to further utilize untreated water from Jatibarang.

The successes of Semarang's West Flood Canal project are in the process of being replicated at its east canal. The construction of the East Flood Canal began in early 2018 and the project scope includes the normalization of 14.6 kilometers of river from the Pucanggading Dam to the Java Sea. The first phase of this project began with the most difficult 6.7 kilometers of riverbed sediment dredging by starting at the dam and working downstream. This phase had a budget of Rp 560 billion and affected residential and informal commercial activities of the community. The nationally managed program was integrated into the city's development program and the city government persuaded the affected communities to participate in remediation efforts, including providing new shops for hundreds of informal businesses not far from their existing locations. However, the completion of the project's first phase was delayed due to some street vendors being reluctant to relocate (Tribun Jateng 2019).

The successes of Semarang's West Flood Canal project are in the process of being replicated at its east canal.

The second phase of the project, comprising 7.7 kilometers, continues from the middle segment heading to the south towards the Pucanggading Dam. This phase is scheduled to be completed by the end of 2020.

According to the project's detailed engineering design, after normalization, the width of the river channel will increase significantly to 65 meters at the surface and about 50 meters at the riverbed. In addition, flood-retaining walls of varying heights are to be constructed, ranging from 40 cm to 100 cm. Various types of public facilities have been planned in sports and recreation zones with a total area of 40 hectares; these will be located in residential areas including the Gayamsari, Karangtempel, Sawah Besar, Pandansari, Mlatiharjo, and Rejosari subdistricts.

To implement projects such as these, the Semarang City government needs to deal with a significant financing gap while solving its emerging development issues and to sustain the benefits of its ongoing initiatives. The city's engagement in global networks provides more opportunities by intensifying collaborations with international platform partners. There are some good examples, such as the Bus Rapid Transit services improvement project, which started in 2016 in cooperation with the Institute for Global Environmental Strategies and Toyama from Japan, and a waste-to-energy project in collaboration with Denmark's International Development Agency in 2017 that is continuing with an initiative for

PPP works on renewable energy. In 2019 a new PPP project was also initiated to develop a Light Rail Train system. Speaking to the importance of these efforts, at the beginning of 2019 Semarang City won the nationwide annual performance competition for PPP schemes organized by BAPPENAS.

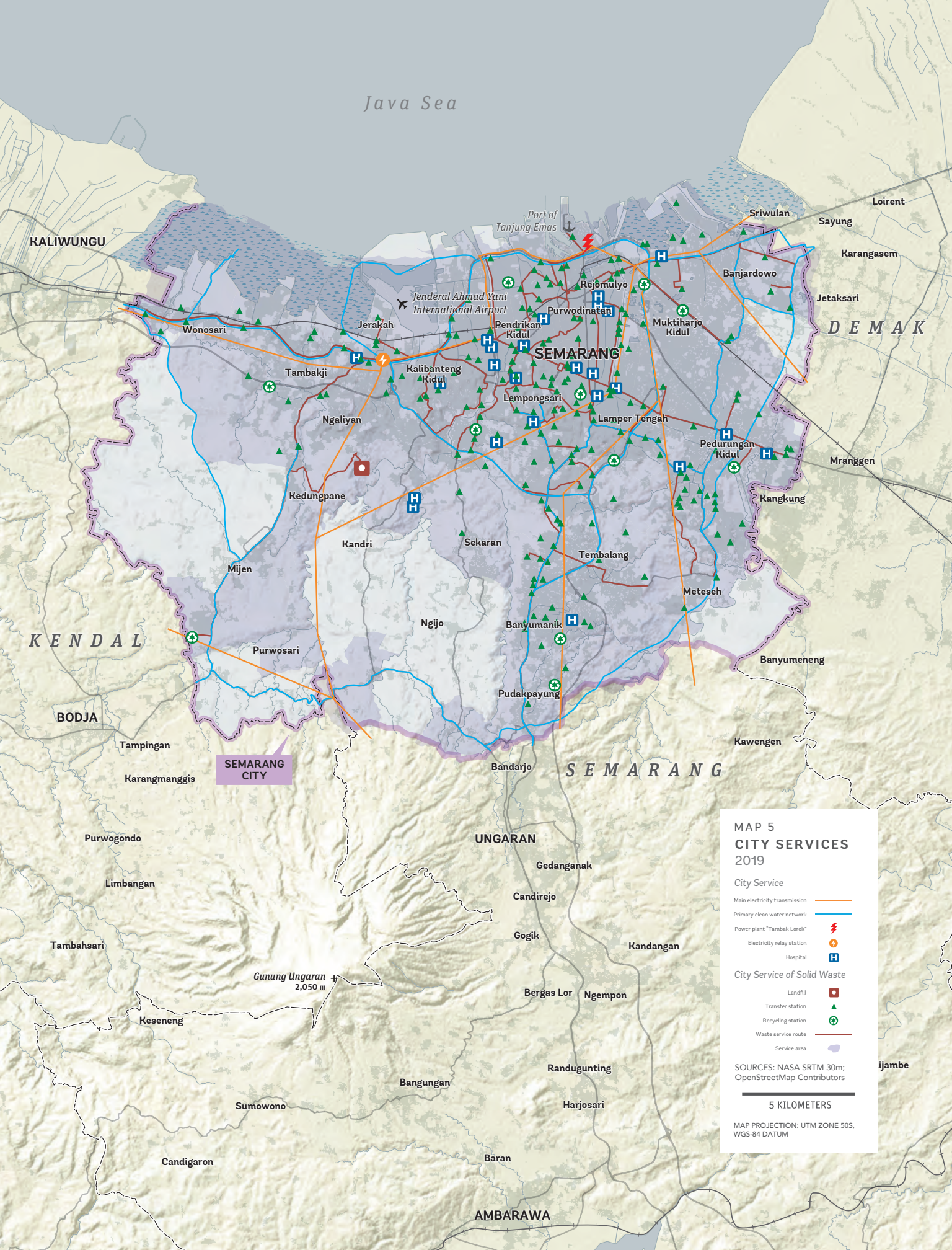
PRIVATE PARTICIPATION

Land owners and developers are the two most important types of private stakeholders in the development process. Most strategically located land in the Semarang metropolitan area is already possessed by private owners, particularly large-scale developers. Therefore, clear communication and coordination mechanisms between private land owners and the government are necessary to ensure that land use allocations meet the private sector's expectations, but also to protect the public's aspirations and needs while safeguarding environmental sustainability. The government should also be equipped with robust policy instruments.

A good example of private participation is the BSB integrated satellite city development project, which started in 1999 and comprises approximately 1,000 hectares in the western area of Semarang City.

A good example of private participation is the BSB integrated satellite city development project, which started in 1999 and comprises approximately 1,000 hectares in the western area of Semarang City. The BSB developers designed and prepared the required infrastructure and detailed land use allocations with good coordination with local government. Local government committed funding to improving the area's main road connectivity and drainage system, including the development of a new corridor for public buses to increase connections from BSB to the city center. Likewise, the BSB developers had a responsibility to develop local roads and other basic infrastructure, including developing public open spaces and water reservoirs, to increase the quality of the environment. Map 4 shows some of this infrastructure. This kind of negotiation cannot be easily done between the local government and smaller developers with low capabilities. The example demonstrates that developers with high capabilities are needed to develop areas in an integrated manner in partnership with the local government.

PPPs and corporate social responsibility initiatives are the most common mechanism involving the private sector in supporting the development process. PPPs are likely to be more focused on private participation for the provision of public infrastructure, while corporate social responsibility initiatives are more about private sector support for community empowerment and environmental conservation. Over the last five years PPPs have been used even more intensively to minimize financing gaps and ensure that local government is not the only stakeholder responsible to fulfill development needs. There are some national initiatives to motivate local governments to use PPPs to implement their development plans, including incentive schemes and government support through three financial institutions under the Ministry of Finance (Perseroan Terbatas Sarana Multi Infrastruktur [PT. SMI], Perseroan Terbatas Penjaminan



MAP 5

CITY SERVICES 2019

City Service

- Main electricity transmission
- Primary clean water network
- Power plant "Tambak Lorok"
- Electricity relay station
- Hospital

City Service of Solid Waste

- Landfill
- Transfer station
- Recycling station
- Waste service route
- Service area

SOURCES: NASA SRTM 30m; OpenStreetMap Contributors

5 KILOMETERS

MAP PROJECTION: UTM ZONE 50S, WGS-84 DATUM

Infrastruktur Indonesia or Indonesia Infrastructure Guarantee Fund [PT. PII] and PT. SMF).

An important development project using a PPP scheme in Semarang City has been the West Semarang Water Supply Project that began in 2017. The PPP project is led by Semarang Water Company (PDAM Semarang) and uses untreated water from Jatibarang Dam to supply clean water to 60,000–70,000 households and industries located in three subdistricts (Semarang Barat, Tugu, and Ngaliyan) in the western part of Semarang City. The estimated cost of the investment is $90 million for a two-year construction period and 25 years of commercial operation. The private company is responsible for the water treatment, reservoir construction, and transmission, while the government committed the water pipe distribution network. PDAM Semarang receives some government support through PT. SMI to prepare and implement the project. Additionally, this work may encourage the development of the BSB area and industrial zone that is located in the service area of Jatibarang Dam. The area's economic activities are expected to increase due to the positive impact of this water supply project.

There have been three main stages of government that have shaped the integration process in Semarang metropolitan area post-independence: Centralization, Decentralization, and New Autonomy.

TYPES OF SOLUTIONS AND PHASING

There have been three main stages of government that have shaped the integration process in Semarang metropolitan area post-independence: Centralization, Decentralization, and New Autonomy. The national government was the central player in directing the development process post-independence. Decentralization in 1999 was the turning point for transferring some of the roles and responsibilities to the local government. The local governments across the country addressed this new situation differently, very much influenced by their individual financial and resource capacities. Semarang City's administration has been one of the governments that have shown some innovation and strategy in their methods of addressing unprecedented cross-boundary urban challenges.

Semarang City has been playing the central role in ensuring a sustainable integration process for the metropolitan area. The provincial government (i.e. BAPPEDA and the Bureau of Government, Regional Autonomy, and Cooperation under the secretariat office of Central Java Province) has had challenges mainly because of issues with their budgeting regulations. There is still also a regional capacity gap, mostly in terms of financial and human resources, between Semarang City and the local governments of the surrounding areas. The situation has been driving Semarang City to take a leading role through at least two different strategies. The first is initiating integrated work processes, as indicated

by the Kedungsepur MOU signed in 2018 and its two resulting agreements, and the second is intensifying communication with national government around safeguarding and ensuring that support from them provides the maximum leverage for the Semarang metropolitan area's economy.

Along with the coordination with the neighboring regencies, internally the Semarang City government has also been initiating communication with the private sector stakeholders and maintaining connections with local experts through the Semarang Advisory Board and various community groups. Regular coordination meetings, for example between Semarang's mayor and members of the Indonesian Real Estate Association, the Indonesian Chamber of Commerce and Industry, and local community preparedness groups are important approaches to connecting the government with local stakeholders. Issues related to land acquisition, relocation, and broader issues of development within the city are discussed in regular meetings.

Semarang metropolitan area has, largely in the New Autonomy stage of post-independence governance, shown more inclusivity in its development process as there has been more participation from the private sector and community groups. There has been found to be almost no public objections to the projects that have been implemented. Very sensitive issues such as land acquisition and relocation of informal sectors, slums, or squatter settlements are always approached through consultation meetings. The *kelurahan*, or urban communities, are the fourth and lowest level of government and play a very important role in bridging communication between local people/community representatives and government. As a result, much of the process of land acquisition, such as for the flood management project in the Garang River basin or slum upgrading under the KOTAKU Program, have run relatively smoothly. Most of the new public housing developments, for example, are located not too far from activity centers as local stakeholders have been able to send the message to government that they will only agree to be relocated under certain conditions. Even though in most cases the process is very slow due to the large volume of meetings and communication, which results in delays or even postponement of the project work, the strategy for ensuring inclusivity since the beginning of the projects' planning and implementation has overall made Semarang's development journey more conducive and synergetic.

Despite all of the good things that have been achieved so far, there are still challenges and pending tasks for environmental conservation, as the economy and welfare are still regarded as the most important government indicators

to measure development success in Semarang. One success story is that of the protection of a particular monkey species during implementation of the Jatibarang Dam project; the forested area has been preserved for the monkeys. After some studies and coordination among the relevant agencies, the monkey forest is becoming a successful tourist destination in Semarang. Other environment-based works, such as mangrove conservation, have also been taking place in the area with the support of international foundations such as the Rockefeller Foundation and Mercy Corps.

In the housing sector, a financial instrument designed by the Ministry of Finance through the establishment of Perseroan Terbatas Sarana Multigriya Finansial (PT. SMF) in 2005 has increased the availability of long-term funding for housing development projects, which then enables affordable home-ownership, particularly for medium- and low-income groups. PT. SMF serves as a secondary financial market to fund private developers with lower-interest loans than primary financial institutions (conventional banks), with an average capacity to facilitate 20,000–25,000 home purchases per annum. For example, in 2018 PT. SMF contributed 16 percent of the total disbursement of loans for housing ownership projects in Indonesia, and 636 debtors of this scheme were in the Central Java region (PT. SMF 2018).

Semarang is a leading city in Indonesia showing a concrete commitment to climate change mitigation and adaptation initiatives.

RISK MANAGEMENT

A feasibility study is part of the formal procedure to start any planning project in Semarang. Additionally, a detailed assessment of the socioeconomic and environmental impact is very important to ensure project sustainability. For particularly big investments, the government may have support from various institutions to increase the quality of the feasibility study. For example, the study for the Integrated Water Resources and Flood management in Garang River basin was supported by JICA and the study for the West Semarang Water Supply PPP project was facilitated by PT. SMI.

The government avoids risks, especially when they relate to the provision of public infrastructure and with greater private involvement in PPP mechanisms, the potential risks are shared more proportionally between the government and the private sector. Typically the government will take responsibility for land acquisition, while the private sector will lead in construction. The government does need to exercise caution and oversight during the design stage, since they will eventually take over the operations and maintenance from the private sector and the equipment and maintenance will become a financial burden if it is not able to be sustainably managed. Previously there have been some unproductive

public expenditures and project handover delays, especially when there have been changes or turnover in the government's strategic role in the PPP process or new decision makers becoming involved and making changes in the project delivery mechanisms. Therefore, cooperation and agreement between the public and private sectors on the details of all PPP projects is very important.

GLOBAL ENVIRONMENTAL BENEFITS: OUTCOMES AND SCALE-UP

Semarang is a leading city in Indonesia showing a concrete commitment to climate change mitigation and adaptation initiatives. As a part of ACCCRN from 2009 to 2014, followed by Semarang City's active and ongoing engagement in the former 100 Resilient Cities Network starting in 2014, the city has introduced initiatives to reduce the impact of climate change in some pilot projects such as a flood early warning system, mangrove preservation, and dengue prevention. The city released its City Resilience Strategy in 2016, and some of the strategies have already been integrated into the medium-term RPJMD plan and spatial plan (*Rencana Tata Ruang Wilayah*).

Some of the strategies have also been implemented by linking them with platform partners, such as in the transportation sector (e.g. Bus Rapid Transit improvement to reduce emissions), where Semarang is collaborating with Toyama and Global Environmental Strategies under the Joint Credit Mechanism scheme.[4] In disaster management, the city government collaborates with the Zurich Alliance; and in mangrove preservation and coastal management the city is supported by the government of the Netherlands. The most current initiative is a climate change resilience project on integrated water management that is supported by the Netherlands Enterprise Agency under the Water as Leverage for Resilient Cities Asia program.[5]

The programs implemented in Semarang metropolitan area have improved capacity building, increased awareness, and most importantly have found innovative solutions to increase the livelihoods of residents. They simultaneously are also improving conservation efforts, and work toward reducing the impacts of climate change. With the integrative urban innovations compiled in this case study of Semarang metropolitan area, the lessons learned can be disseminated, adopted in other locations where relevant, and scaled up to further leverage their global environmental benefits.

[4] A system for cooperation with developing countries in reducing greenhouse gas emissions, in which the result of reduction is assessed as a contribution by both partner countries and Japan (www.mofa.go.jp/ic/ch/page1we_000105.html).

[5] Initiated by RVO (Netherlands Enterprise Agency), the program aims to create an inclusive and innovative pre-project preparation facility using water as leverage for making cities resilient (https://english.rvo.nl/subsidies-programmes/water-leverage).

Financing

FINANCING SOURCES

Understanding how integrative projects are financed can help to promote further coordination efforts. Local government cities and regencies comprising the Semarang metropolitan area are usually financed through three sources of revenue, based on Law No. 33, 2004 on local government. First, own-source city revenues, which include taxes and collected fees. The second source includes national government transfers or balancing funds, which consist of tax revenue funds, non-tax profit sharing funds, general allocation funds, and special allocation funds. The third source is other legitimate revenues, including: transfers consisting of special autonomy funds and adjustment funds; provincial government transfers consist of tax revenue sharing and other profit sharing (provincial/other city/regency governments financial assistance); grants; and emergency funds.

Based on the *Report of Accountability from Mayor of Semarang Municipality at the End of 2017* (Semarang City Government 2018), Semarang City performs better compared with other jurisdictions of the metropolitan area. The own-source revenues of Semarang City contribute almost 50 percent of total revenue, while the surrounding regencies (Semarang Regency, Kendal Regency, and Demak Regency) are only able to provide less than 20 percent of revenue from their own sources. Accordingly, Semarang City receives only 40 percent of its total revenue from the national government, which is much lower than the approximately 70 percent of revenue that national government provided for fulfilling the financial gaps of the surrounding local governments in 2017.

The fourth source of financing is through grants, either bilaterally from multilateral donors, or from other sources, including NGO intervention programs. For example, the Rockefeller Foundation in collaboration with Mercy Corps Indonesia contributed up to $2 million in 2010–2014 to build Semarang City's urban climate resilience under ACCCRN (Setiadi 2016), which was followed by further programs and donors, such as the 100 Resilient Cities network, Zurich Flood Resilience Program, and Water as Leverage for Resilient Cities Asia.

Information regarding Semarang City's financial structure compared to its neighbors is provided in Box 2.

BOX 2. SEMARANG CITY'S FINANCIAL STRUCTURE VERSUS NEIGHBORS

Semarang City has much larger financial capacity than its surrounding regencies. In 2017, Semarang's total revenue was $370 million compared to that of Semarang Regency, Kendal Regency, and Demak Regency, which were each around $130 million–$148 million. Approximately 40–50 percent of these regencies' budgets were allocated to personnel expenditures and their own-source revenue (mostly from tax collection and fees) contributed only approximately 20 percent of their total revenue. Because of this, outside of Semarang City the different administrative areas of the metropolitan area depend greatly on the national government for budget support. At the same time, they still have limited ability to explore alternative development funding from outside of the government. Together with this there is a lack of capacity and most importantly, there is also hesitation to take financial risks.

In terms of revenue distribution, Semarang City funds various sectors within the city as a direct cost (capital expenditure) to operationalize development activities. Based on the city's 2017 annual report, most of the budget goes to three priority sectors: public works (31 percent), health (15 percent), and education (11 percent). The allocation is similar to how other local governments within the Semarang metropolitan area distribute their revenue. The Human Development Index is also an important indicator that influences budgetary allocations. This is a reason why the budgets of most Indonesian local governments focus their resources on the three primary areas of education, health, and increasing per capita income. As a brief illustration for the situation in 2017, the Semarang City budget for development activities had direct expenditures of $205 million, much higher than the surrounding regencies, which ranged from $50 million to $100 million. Around 30 percent of Semarang City's budget is allocated for the three priority areas while the rest is distributed to more than 20 other areas, in accordance with Law No. 23, 2014.

Based upon their financing models, the magnitude of development projects costs can be staggering for local governments without additional support. For instance, the ongoing West Semarang Water Supply Project as a PPP has a total investment cost of approximately $90 million. This illustrates the financial gaps faced by local government in their challenges to promoting integrative processes.

Source: Semarang City Government 2018.

The own-source revenues of Semarang City contribute almost 50 percent of total revenue, while the surrounding regencies are only able to obtain less than 20 percent of revenue from their own sources.

PROMOTING INTEGRATIVE APPROACHES

The main funding source of integrated programs in Semarang metropolitan area has come from the proponent of the program, whether at the national, provincial, or local levels. As an example, for national government initiatives where the Indonesian government provides the primary funds, the other stakeholder parties (e.g. province and district) provide complementary funding. However, funding for local government-led initiatives is limited to only their own authority and jurisdiction. This demonstrates that funding has not been flexible for local governments when it comes to inter-regional collaboration. For instance, Semarang City is not allowed to spend its funds on the rehabilitation of degraded land in its upper hinterland areas of Kendal. In this example, the provincial government would be responsible for initiating and funding the program due to it being a cross-border intervention.

More recently, there is a strong tendency for the regime of financing at the national and local government levels to shift from "money follows function" to "money follows the program". Under the function regime, local government agencies have the flexibility to propose programs that will be included in the Local Government Work Plan. Then BAPPEDA connects the proposals and groups them into several program themes for approval in the regional/local government budget.

This financing regime embraces the assumption that urban development goals and objectives are impossible without intervention. In other words, under this financing regime planning is designed to achieve shared goals and objectives built by strong consensus across agencies and sectors. Therefore, this kind of financing model avoids overlapping programs and activities between ministries at the national level or between agencies at the local level. It also aims to strengthen connections between ministries and agencies. In summary, the money-follows-program regime will produce a series of activities that lead to achieving prioritized goals efficiently so that the benefits and impacts of the program are more tangible and significant.

INNOVATIVE FINANCING MECHANISMS

Several projects clustered in Semarang's Garang River basin showcase innovative funding mechanisms, which are different from traditional business as usual financing.

One project that has innovative financing mechanisms, introduced earlier, is the integrated water resources and flood management project in the West Flood Canal of Semarang (Garang River basin). The financing mechanism of the project also indicates the integrated nature of the project activities as it has shifted from single-sector to multi-sector allocation, as well as from one independent project to several interconnected projects, including currently at least four additional components since the inauguration of Jatibarang Dam in 2014. These additional components include an urban regeneration project along the Garang River, community empowerment for the people who live in the area surrounding the dam, tourism attractions development, and the development of a water supply system.

This sophisticated project has required a complex financing structure. The total investment for integrated water resources and flood management project was $85 million. The project funding comes from a JICA loan of $50 million, while the other $35 million comes from the national government's budget. Separately, Central Java Province and Semarang City have contributed not less than $20 million for land acquisition, including the urban regeneration project along the Garang River mentioned earlier that relocates informal traders along the river to a new formal market nearby.

The project also incorporated an important community empowerment program. Training and other income-restoration activities were supported by the national government through BBWS in cooperation with the local government. The main aim of this sub-component was to increase the income of the local people based on local economic activities. The annual budget for this component was $290,000.

A separate innovative financing initiative is the West Semarang Water Supply PPP, which is an investment of $90 million. As mentioned earlier, the project effected a good transformation beyond business as usual practices by leveraging the private sector.

Semarang metropolitan area has leveraged a range of integrative urban innovations over time and continues to improve coordination through the leadership of Semarang City.

Conclusion

EXTERNAL VALIDITY

Semarang's pressing metropolitan issues include the need for more affordable housing, better transportation and community infrastructure, adequate water, and increased resilience to climate change and natural disasters. These challenges need to be balanced with limited budgetary resources and capacity gaps, together with Indonesia's typical human development priorities at the local level of education, health, and increasing per capita income. Semarang metropolitan area has leveraged a range of integrative urban innovations over time and continues to improve coordination through the leadership of Semarang City.

The top-down urban solutions demonstrated by Semarang metropolitan area have been implemented in some form in other parts of Indonesia and are similarly transferable to other locations. The inter-city transferability of the innovations is not a problem domestically because these innovations were developed as national programs by the Indonesian national government. For instance, all three generations of KIP and housing solutions have been implemented in other Indonesian cities.

The bottom-up initiatives, while unique to Semarang's context, speak to some processes that were developed during the colonial period and revisited in different forms during Indonesia's gradual decentralization. More recently Semarang's West Flood Canal, and then subsequently its East Flood Canal, have leveraged bottom-up initiatives to locally champion metropolitan integration by connecting and clustering solutions. For instance, the multi-sectoral water resource and flood management approach to develop a river basin area with associated programming is a good example that is relevant for other cities in Indonesia and beyond. In practice, it is possible to cluster and integrate infrastructure works (e.g. dam construction and river normalization) with other relevant physical projects such as the development of housing and public space improvement, while also considering socioeconomic outcomes such as tourism, local economic development, and community empowerment.

Overall, Semarang's case study demonstrates that the innovations showcased are step-by-step, or incremental. They are iterative and have not involved a radical solution straight away. Together, the implementation of these innovations helps Semarang achieve global environmental benefits and improve its overall urban sustainability.

Meanwhile, these urban innovations could also be considered in other countries' contexts. For instance the urban development history of Semarang reveals that some of the solutions took references from the methods of the Netherlands, which eventually modernized urban planning in Indonesia.

LESSONS LEARNED

Three important lessons have been learned from the Semarang case study about the future challenges of promoting integration.

First, sectoral and spatial integrations need to consider the governance system particularly in a decentralized system that is relatively complex and rigid in practice. No matter how perfectly integration is designed, the strong division of vertical authority and horizontal jurisdiction between agencies and across government has made integration more difficult. Integration requires extra coordination and intensive communication.

Second, providing a wide range of financing options is an important key to integration. Flexible financing options help local governments to be more self-reliant, which at the same time reduces dependency on the national government.

Third, actors or agents who are involved in integration have different knowledge bases, resources, and capacities. Gaps in resource allocation create barriers and stifle efforts, which eventually discourage collaboration. Leadership is the key in this situation. Initiative in building communication and coordination and leading the integrative process of planning and development is highly required. Strengthening the leadership of cities and regencies to foster integrated metropolitan development is a strategic investment for the future of Semarang and beyond.

In practice, it is possible to cluster and integrate infrastructure works with other relevant physical projects such as the development of housing and public space improvement, while also considering socioeconomic outcomes such as tourism, local economic development, and community empowerment.

Density

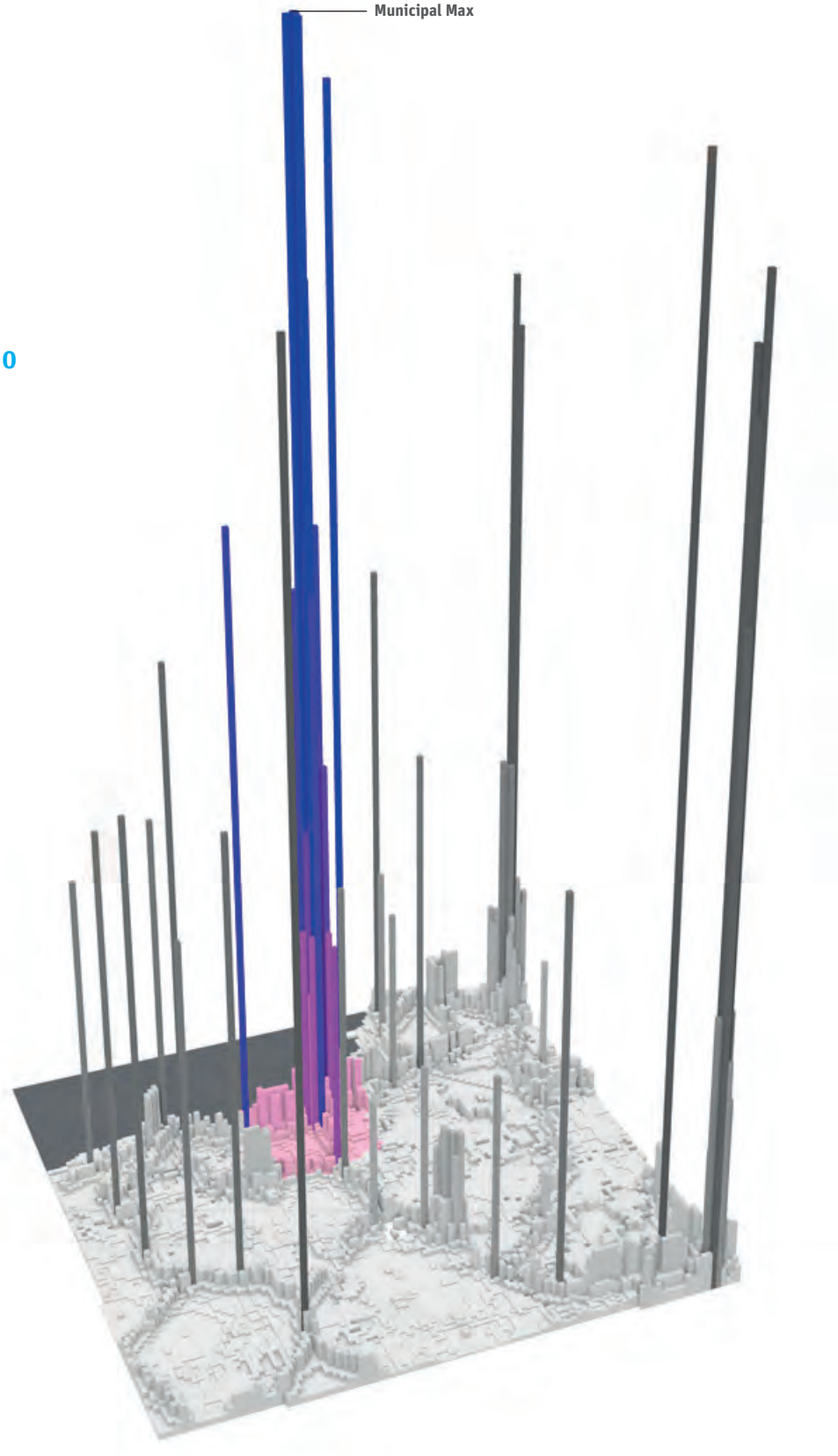


Figure 4

POPULATION DENSITY, 2000

Municipal
- Maximum: 95,833 people/km²
- Minimum: 106 people/km²
- Average: 4,461 people/km²

Source: LandScan 2017.

Figure 6
Overlay of density levels, 2000–2017

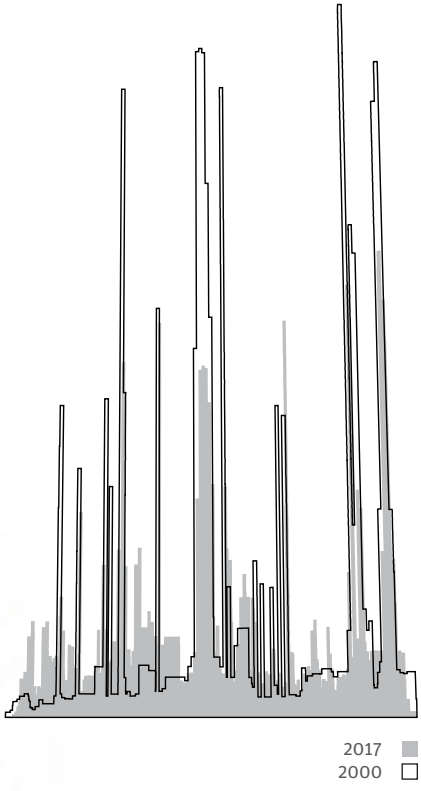
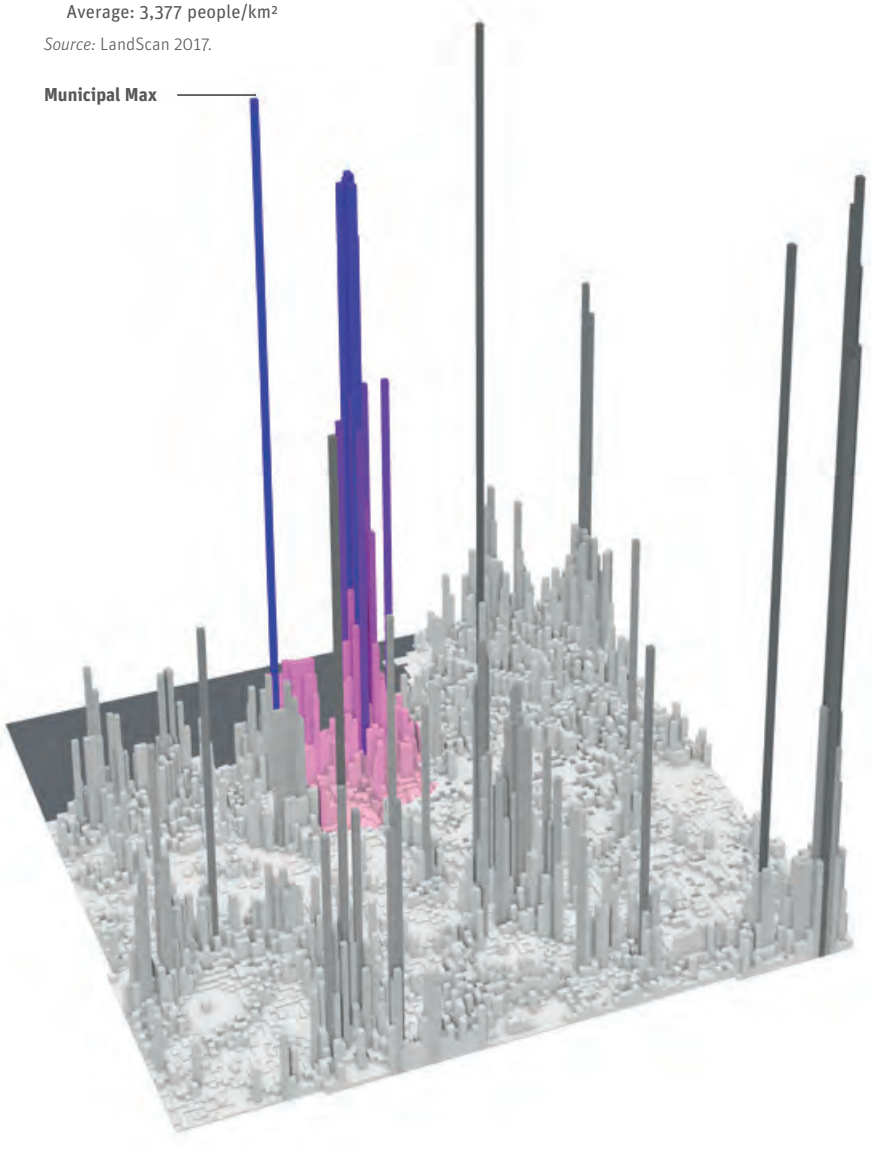


Figure 5
POPULATION DENSITY, 2017

Municipal
Maximum: 54,948 people/km²
Minimum: 1 people/km²
Average: 3,377 people/km²

Source: LandScan 2017.



REFERENCES

Banfield, Edward C. 1959. "Ends and means in planning". *International Social Science Journal XI* 3: 361–368.

Central Bureau of Statistics (CBS) of Demak Regency. 2018. *Demak Regency in Figures 2018*. Demak: CBS of Demak Regency.

CBS of Indonesia. 2018. *Indonesia's Population Projection 2015–2045*. Jakarta: CBS of Indonesia.

___. 2020. "Indonesia Administrative Level 0-4 Boundaries". April 8, 2020. Jakarta: CBS of Indonesia. https://data.humdata.org/dataset/indonesia-administrative-boundary-polygons-lines-and-places-levels-0-4b.

CBS of Semarang City. 2017. *Economic Indicator of Semarang Municipality 2017*. Semarang: CBS of Semarang City.

___. 2018. *Semarang Municipality in Figures 2018*. Semarang: CBS of Semarang City.

Coté, Joost. "Staging modernity: the Semarang international colonial exhibition, 1914." *Review of Indonesian and Malaysian Affairs* 40(1): 1–44.

Firman, Tommy. 2000. "Rural to urban land conversion in Indonesia during boom and bust period." *Land Use Policy* 17(1): 13–20.

JawaPos. 2018. "Masuki Babak Baru, MoU Pengembangan Kedungsepur Ditandatangani [Entering a New Era, the MoU of Kedungsepur Development was Signed].". April 10, 2018. www.jawapos.com/ekonomi/10/04/2018/masuki-babak-baru-mou-pengembangan-kedungsepur-ditandatangani/.

Lindblom, Charles E. 1979. "Still muddling, not yet through." *Public Administration Review* 39(6): 517–526.

Mehrotra, Shagun. 2020. "Synthesis Report." In *Greater Than Parts: A Metropolitan Opportunity*, edited by Shagun Mehrotra, Lincoln L. Lewis, Mariana Orloff, and Beth Olberding. Washington, DC: World Bank.

PT. Sarana Multigriya Finansial (PT. SMF). 2018. Annual Report 2006–2018 PT. SMF.

Roberts, M., F. Gil Sander, and S. Tiwari, eds. 2019. *Time to ACT: Realizing Indonesia's Urban Potential*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1389-4.

Roosmalen, Pauline K. M. van. 2015. "Netherlands Indies town planning: an agent of modernization (1905–1957)." In *Cars, Conduits, and Kampongs: The modernization of Indonesian cities, 1920–1960*, edited by Freek Colombijn and Joost Coté, 88–121. Leiden: Brill for the Royal Netherlands Institute for Southeast Asian and Caribbean Studies (KITLV).

Sabatier, Paul. A. ed. 1999. *Theories of the Policy Process: Theoretical Lenses on Public Policy*. Boulder: Westview Press.

Semarang City Government. 2018. *Report of Accountability (LKPJ) from Mayor of Semarang Municipality at the End of 2017*. Semarang: Semarang City Government.

Setiadi, Rukuh. 2016. *The governance of climate change in Semarang: past, present and future* (in Bahasa), RIPTEK 10(1): 33–42.

Setiadi, Rukuh and Alex Y. Lo. 2019. "Does policy research really matter for local climate change policies?" *Urban Research and Policy* 37(1): 111–124.

Setiadi, Rukuh and Johanna Nalau. 2015. "Can urban regeneration improve health resilience?" *Asian Cities Climate Resilience Working Paper Series,* 23, London: IIED.

Silas, Johan. 1984. The Kampong Improvement Programme of Indonesia. In *Low-Income Housing in the Developing Countries*. John Wiley and Sons.

___. 1992. "Government-community partnerships in kampong improvement programs in Surabaya." *Environment and Urbanization* 4(2): 33–41.

Simon, Herbert A. 1972. "Theories of bounded rationality." In *Decision and Organization*, edited by C. B. McGuire and R. Radner. Amsterdam: North-Holland Publishing Company.

Singh, G., S. Raghupathy, and P. Volosin. 2017. *Kota Semarang: Urban Growth and Access to Public Infrastructure*. Advance edition. Washington, DC: World Bank.

Singh, G., T. Hartanto, J. Diaz-Azcunaga, R. Ochoa-Sosa, and E. Perez-Denicia. 2019. "Affordable housing in Indonesia: A land suitability perspective." 2019 World Bank Conference on Land and Poverty, Washington, DC. Unpublished conference paper.

Tribun Jateng. 2019. "Masih Terkendala Bangunan PKL, Proyek Normalisasi Banjir Kanal Timur (BKT) Semarang Molor [Still Constrained by Vendors in Kaki Lima, Semarang East Canal Flood Normalization Project has Been put on Hold]." August 19.

United Nations Department of Economic and Social Affairs (UNDESA). 2018. World Urbanization Prospects: The 2018 Revision, online edition.

World Bank. 2016. "How Sharing Data and Collaboration Can Improve Indonesia's Urban Planning." September 22. http://www.worldbank.org/en/news/feature/2016/09/22/how-gathering-data-in-one-place-can-improve-indonesia-cities.

___. 2019. "Project Appraisal Document for the National Urban Development Project." May 20. Washington, DC: World Bank.

Wijono, R. Sastro. 2015. "Public housing in Semarang and the modernization of kampongs, 1930–1960." In *Cars, Conduits, and Kampongs: The modernization of Indonesian cities, 1920–1960*, edited by Freek Colombijn and Joost Coté, 172–192. Leiden: Brill for the Royal Netherlands Institute for Southeast Asian and Caribbean Studies (KITLV).

ABBREVIATIONS

ACCCRN	Asian Cities Climate Change Resilience Network
BAPPENAS	Ministry of National Development Planning of the Republic of Indonesia (Badan Perencanaan Pembangunan Nasional)
BAPPEDA	Regional Development Planning Agency
BBWS	Greater Basin Territory Center
BSB	Bukit Semarang Baru
CBS	Central Bureau of Statistics
CPL	City Planning Labs
IUIDP	National Program for Integrated Urban Infrastructure Development
JICA	Japan International Cooperation Agency
KIP	Kampong Improvement Program
KOTAKU	Cities Without Slums
LPMK	Urban Village Empowerment Institution
MOU	Memorandum of Understanding
NGO	Nongovernmental organization
NSUP	National Slum Upgrading Program
NUDP	National Urban Development Project
PNPM	National Program for Community Empowerment
PPP	Public-Private Partnership
PT. PII	Perseroan Terbatas Penjaminan Infrastruktur Indonesia
PT. SMF	Perseroan Terbatas Sarana Multigriya Finansial
PT. SMI	Perseroan Terbatas Sarana Multi Infrastruktur
Renja OPD	Agency Annual Development Plan
Renstra OPD	Agency Strategic Plan
RPJMD	Rencana Pembangunan Jangka Menengah Daerah (district-level medium-term development plan)
SOTK	Organizational Structure and Work Procedure
UNDESA	United Nations Department of Economic and Social Affairs

Currency exchange rate: IDR 13,500 = 1 USD

GREATER THAN PARTS

A Metropolitan Opportunity

How rapidly growing cities utilize integrated planning to decarbonize urbanization

Cities are the source of over 70 percent of the world's greenhouse gas emissions. Cities are also the engines of the global economy, concentrating more than half the world's population. By the year 2050, two-thirds of the world will be urban, with cities accommodating an additional 2.5 billion people over today's total. Nearly all of this urban growth will occur in developing countries. This concentration of people and assets also means that the impacts of natural disasters, exacerbated by the changing climate, may be even more devastating, both in terms of human lives lost and economic livelihoods destroyed. Earth is on a trajectory of warming more than 1.5°C unless important decarbonizing steps are taken.

Often urban policymakers prescribe integration as the solution to steering urbanization towards decarbonization to achieve greater global and local environmental benefits. However, little is known about the struggles—and successes—that cities in developing countries have in planning, financing, and implementing integrated urban solutions.

Greater Than Parts: A Metropolitan Opportunity presents nine diverse metropolitan areas as individual case studies each with a selection of urban innovations. From the analysis, the report derives models, poses guiding questions, and presents key principles to provoke and inspire action by cities around the world.

The main objective of this report is to understand how developing and emerging economies are successfully utilizing *horizontal integration*—across multiple infrastructure sectors and systems—at the metropolitan scale to deliver greater sustainability. Integrated planning processes extending well beyond city boundaries are examined to determine how they have been financed and implemented. The report's primary audience is therefore city decision makers, their financiers, technical advisers, and practitioners most interested in applying integrated approaches to sustainable urban planning in capacity-constrained environments.

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SUSTAINABLE DEVELOPMENT GOALS

11 SUSTAINABLE CITIES AND COMMUNITIES