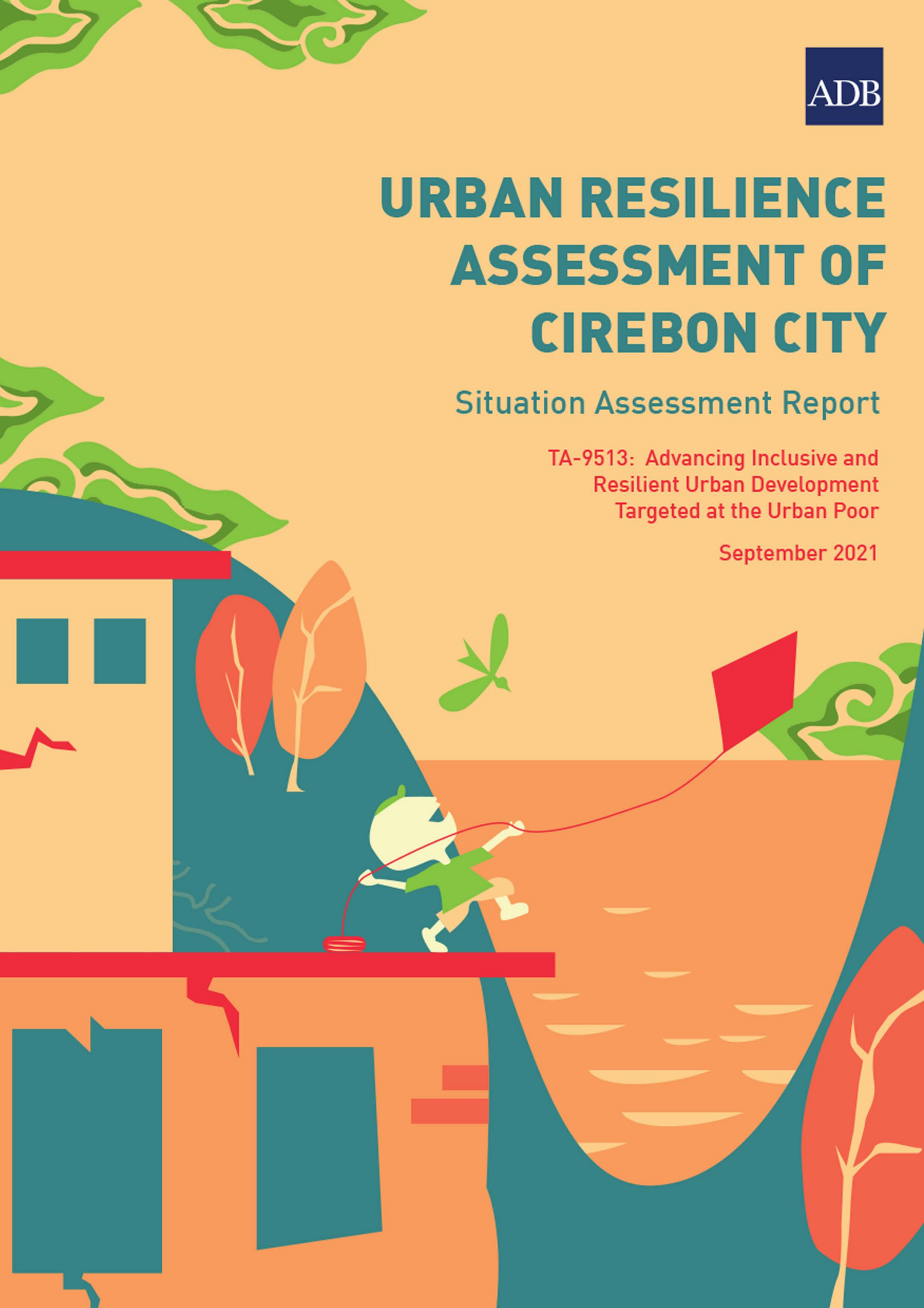
URBAN RESILIENCE ASSESSMENT OF CIREBON CITY

Situation Assessment Report

TA-9513: Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor

September 2021



Urban Resilience Assessment of Cirebon City

TA-9513 REG: Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor


ADB


URBAN CLIMATE
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PREFACE

The team of Livable Settlements Investment Project consultants supported by TA-9513 REG: Advancing Inclusive and Resilient Urban Development Targeted at the Urban Poor would like to acknowledge the valuable contributions of numerous institutions and individuals who supported this report.

First and foremost, we would like to thank the Asian Development Bank (ADB), particularly the Southeast Asia Urban Development and Water Division; the Sustainable Development and Climate Change Department; and the Indonesia Resident Mission. The strategic guidance from our team leaders, Joris van Etten and Anastasia Carolina, has been invaluable to the project.

We would also like to thank Arghya Sinha Roy and the team administering TA-9513. Ongoing urban research in Cirebon City and Makassar City has been generously supported through this technical assistance. The TA itself is funded by the Urban Climate Change Resilience Trust Fund, a $150 million multi-donor trust fund administered by ADB under the Urban Financing Partnership Facility. With funding from the Rockefeller Foundation and the Governments of Switzerland and the United Kingdom, it aims to support fast-growing cities in Asia reduce risk of floods, storms, and droughts for the poor and vulnerable by helping to better plan and design resilient infrastructure.

The team further wishes to thank associated consultant teams for their efforts to coordinate and collaborate on project deliverables for each city. Primary research conducted by the youth-led research team through ADB's Youth for Asia initiative will provide valuable insight into issues confronted by vulnerable youth in Cirebon City. Similarly, desk research from Ramboll consultants supported through the ASEAN-Australia Smart Cities Trust Fund provided useful context for the team's research in Makassar City.

Lastly, the team would like to thank the governments and residents of Cirebon City and Makassar City who met with us and supported the data collection process, in person and virtually. Their support and generosity of time have been invaluable in helping us learn about and understand their cities.

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In Kelurahan Kesepuhan, local artisans make traditional Cirebonese masks as a livelihood. Asian Development Bank.

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GLOSSARY

ADB	Asian Development Bank	
BAPPEDA / BP4D	Regional Development Planning Agency / Regional Development Planning, Research and Development Agency	*Badan Perencanaan Pembangunan Daerah / Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah*
BAPPENAS	Ministry of National Development Planning	*Badan Perencanaan Pembangunan Nasional*
BBWS	Cimanuk-Cisanggarung Greater Basin Territory Center	*Balai Besar Wilayah Sungai Cimanuk-Cisanggarung*
BNPB	National Board for Disaster Management	*Badan Nasional Penanggulangan Bencana*
BPBD	Regional Board for Disaster Management	*Badan Penanggulangan Bencana Daerah*
BPN	Land Administration Office	*Kantor Pertanahan (Kantah)*
BPPIKHL	Regional Center for Climate Change and Forest & Land Fires	*Balai Pengendalian Perubahan Iklim dan Kebakaran Hutan & Lahan (PPI dan Karhutla) Jawa Bali Nusra*
BPS	Statistics Indonesia	*Badan Pusat Statistik*
DAMKAR	Fire Department	*Dinas Pemadam Kebakaran*
DGHS	Directorate General of Human Settlements	*Direktorat Jenderal Cipta Karya*
DGWR	Directorate General of Water Resources	*Direktorat Jenderal Sumber Daya Air*
DINKES	Department of Health	*Dinas Kesehatan*
DISHUB	Department of Transportation	*Dinas Perhubungan*
DISPUSIP	Library and Archives Department	*Dinas Perpustakaan dan Kearsipan*
DKIS	Department of Information, Communications, and Statistics	*Dinas Komunikasi Informatika dan Statistik*
DKOKP	Department of Youth, Sports, Culture, and Tourism	*Dinas Kepemudaan, Olahraga, Kebudayaan, dan Pariwisata*
DLH	Department of Environment	*Dinas Lingkungan Hidup*
DPKUKM	Department of Industry, Trade, and SME Cooperatives	*Dinas Perindustrian Perdagangan dan Koperasi UKM*
DPPKP	Department of Food, Agriculture, Maritime Affairs, and Fisheries	*Dinas Pangan, Pertanian, Kelautan, dan Perikanan*
DPRD	City Council	*Dewan Perwakilan Rakyat Daerah*
DPUPR	Public Works and Spatial Planning Agency	*Dinas Pekerjaan Umum dan Penataan Ruang*
DSPPPA	Department of Social Services, Women's Empowerment, and Child Protection	*Dinas Sosial, Pemberdayaan Perempuan, dan Perlindungan Anak*
DTKS	Integrated Social Welfare Database	*Data Terpadu Kesejahteraan Sosial*
GOI	Government of Indonesia	*Pemerintah Republik Indonesia*

IPAL	Wastewater treatment plant (WWTP)	*Instalasi Pengolahan Air Limbah*
IPLT	Fecal sludge treatment plant	*Instalasi Pengolahan Lumpur Tinja*
Kecamatan	Sub-district, an administrative unit below city or regency level	
Kelurahan	Urban village, an administrative unit below sub-district level	
KOTAKU	Cities without Slums Program	*Program Kota Tanpa Kumuh*
LSIP	Livable Settlements Investment Project	
MBR	Low-income households	*Masyarakat Berpenghasilan Rendah*
MoASP	Ministry of Agrarian Affairs and Spatial Planning/National Land Agency	*Kementerian Agraria dan Tata Ruang/BPN*
MoEF	Ministry of Environment and Forestry	*Kementerian Lingkungan Hidup dan Kehutanan*
MoF	Ministry of Finance	*Kementerian Keuangan*
MoSA	Ministry of Social Affairs	*Kementerian Sosial*
MPWH	Ministry of Public Works and Housing	*Kementerian Pekerjaan Umum dan Perumahan Rakyat*
PERUMDAM	Local Water Corporation	*Perusahaan Umum Daerah Air Minum*
PERKIM	Department of Housing and Settlements	*Dinas Perumahan Rakyat dan Kawasan Permukiman*
PKL	Street vendors	*Pedagang Kaki Lima*
POKJA	Working group	*Kelompok Kerja*
POLRI	Indonesian National Police in Cirebon City	*Kepolisian Negara Republik Indonesia di Kota Cirebon*
Renstra PUPR	Ministry of Public Works and Housing Strategic Plan	*Rencana Strategis PUPR*
RPJMD	Regional Medium-Term Development Plan of Cirebon City	*Rencana Pembangunan Jangka Menengah Daerah Kota Cirebon*
RPJMN	National Medium-Term Development Plan	*Rencana Pembangunan Jangka Menengah Nasional*
RT	Neighborhood unit, a subnational administrative unit below community level	*Rukun Tetangga*
RTRW	General Spatial Plan	*Rencana Tata Ruang Wilayah*
RUSUNAMI	Public housing flats for sale	*Rumah Susun Sederhana Milik*
RUSUNAWA	Public rental housing flats	*Rumah Susun Sederhana Sewa*
RW	Community unit, a subnational administrative unit below village level	*Rukun Warga*
SATPOL PP	Municipal Police	*Satuan Polisi Pamong Praja*
SKPD	Regional work unit	*Satuan Kerja Perangkat Daerah*
UMKM	Micro, small, and medium enterprises	*Usaha Mikro, Kecil, dan Menengah*
UPTD	Regional technical implementation unit	*Unit Pelaksana Teknis Daerah*

EXECUTIVE SUMMARY

Cirebon City: "A creative city based on culture and history"[1]

Area: 3,736 ha
Slum area: 185 ha
Population: 341,725 people
Population growth rate: 0.82%
Human Development Index: 74.9
Poor population: 30,610 people
Slum population: 62,788 people

Population in bottom 40% of national income distribution: 122,475 people
Gross Regional Domestic Product per capita (2019): US$4,900 (Rp68.9 million)
Urban development trends: Urban expansion, land reclamation, flooding, food insecurity

HUMAN CAPITAL

Life Expectancy Index: 74.9
Education Index: 69.4
Unemployment rate (2019): 9%
Informal Employment (2019): 38% of economically active population
Social Protection: 36% of total population included in the Integrated Social Welfare Database (DTKS)

NATURAL CAPITAL

Natural resources: Coast, mangrove forests, rivers
Environmental Quality Index (2019): 52.0 (Poor)
Air Quality Index (2019): 68.6 (Poor)
Water Quality Index (2019): 56.9 (Satisfactory)
Land Cover Index (2019): 35.8 (Dangerous)
Climate Change Vulnerability Index: 13 of 22 *kelurahan* vulnerable

SOCIAL CAPITAL

Cultural heritage: Historic architecture, traditional art forms, seafaring traditions, royal lineage
Gender Development Index (2018): 93.9
Gender Empowerment Index (2018): 74.0
Youth population (2019): 84,424
Crime rate (2019): 446 per 100,000 people

1. All figures from 2020 data unless otherwise noted.

BUILT CAPITAL

Water Supply

84% population within PDAM service area (2015)

89% of families in slums have access to safe drinking water

66% of families in slums have the minimum daily requirement for water needs of 60 liters/person/day

Sanitation

On-site system: **64** public toilets and one fecal sludge treatment plant (non-functioning)

Off-site system: **91** communal systems and four IPAL service approximately 8% of the city population

96% of families in slums have access to private or shared latrines or toilets

82% of families in slums use latrines or toilets connected to either a septic tank or sewage treatment system

Stormwater Drainage and Flooding

Existing tributaries and sub-tributaries are primary and secondary drainage channels, combining stormwater and wastewater

Zero pump stations or retention basins to control the flow of river water downstream into the city

81% of drainage channels in slum areas are connected to city-wide networks

50% of existing drainage channels in slum areas have open drains or visible damage

Solid Waste Management

270 tons of waste generated per day on average

67% waste generated is disposed of in landfill

70% of the city area covered by waste management services

26% of families in slums have access to garbage collection points

Public Space

5% total land area is public green open space (2014)

27% of slum areas not located within a 10-minute walk (800 m) from a public park or sports facility

Fire Protection

255 incidents of fire (2019)

Fire response time met benchmark time goal in **75%** of cases

Fleet is **16%** of recommended size and has only two of 10 units operational

79% of slum residences have fire protection infrastructure

Zero slum residences have fire protection equipment

Housing

38% of slum residences conform to zoning code and urban design guidelines

Zero public housing blocks *(rumah susun)*

83% of slum residences meet building code requirements

Mobility and transportation

Two passenger bus terminals (one non-operational); two passenger railway stations; one passenger port terminal; one commercial airport; and several toll roads

97% of neighborhood roads in slum areas connect between or within residential areas

62% of existing neighborhood roads in slum areas have visible damage

The PERUMDAM water reservoir in Kelurahan Sukapura is a city landmark that welcomes visitors to the city. Asian Development Bank

CHAPTER 1

INTRODUCTION

The Livable Settlements Investment Project (LSIP) is a technical assistance project financed by the Asian Development Bank (ADB) to support the Government of Indonesia's efforts to strengthen infrastructure to support economic development and basic services.[1]

The persistence of human settlements with inadequate urban infrastructure and services has multidimensional root causes. Although focused on urban infrastructure and services, the project takes a holistic approach to assessing urban resilience in anticipation that physical infrastructure alone will not be enough to build citywide urban resilience. The project's framework includes four key dimensions:

1. built capital: access to basic services and housing in slum areas;
2. human capital: social and livelihood resilience for the urban poor;
3. natural capital: resilience of natural resources for the urban poor; and
4. social capital: capacity of local government and communities to plan, deliver, operate, and maintain basic services and livelihood support programs for the urban poor.

1.1 PURPOSE AND INTENT

The Urban Resilience Assessment of Cirebon City is a technical assistance report prepared by the LSIP consultant team for ADB. Its purpose is to provide a multidimensional urban overview and needs assessment of slum communities in Cirebon City to: 1) inform ADB financing and enrich ADB knowledge of the urban sector, particularly of secondary cities in Indonesia; and 2) to provide the Government of Cirebon City with key data and tools to prepare urban investment project proposals toward creating a livable city. The report's intent is to take a neutral and inclusive approach to this task.

The report begins with a broad assessment of existing citywide conditions in Chapter 2, subsequently complemented by detailed assessments of physical and non-physical conditions of slum settlements. Chapter 3 will introduce slum settlements in Cirebon City, whereas Chapters 4-7 will in turn evaluate the city's built capital, human capital, natural capital, and social capital. Chapter 8 will assess the fiscal flows and sustainability of the city. The report concludes in Chapter 9 with a synopsis of strengths, weaknesses, and potential approaches to consider in prioritizing investments.

1.2 PROJECT HISTORY AND CONTEXT

The Livable Settlements Investment Project was first included in the Government of Indonesia's Blue Book in 2015 under the name, Slum Improvement in Strategic Human Settlements Area (SISHA) Project.[2] Requested by the Directorate General of Human Settlements (DGHS) within MPWH, the Cities Development Initiative for Asia conducted a pre-feasibility study for potential livable city investments in the cities of Palembang, Banjarmasin, Cirebon, Makassar, and Sorong between 2018 and 2019.

Upon completion of the reports in 2019, ADB and DGHS discussed subsequent steps for project preparation. The potential loan would build on experiences from the completed Neighborhood Upgrading and Shelter Project Phase 2 and from ongoing programs, such as Revitalizing Informal Settlements and Their Environments and the World Bank supported National Slum Upgrading Program. Upon inclusion of the Livable Settlements Investment Project in the 2020 Blue Book, the ADB renewed consultations with

1. Government of Indonesia. 2020. National Medium-Term Development Plan 2020-2024. Development Priority (Prioritas Pembangunan) 5 (PN-5).
2. List of medium-term external loans approved by Government of Indonesia.

government partners to jointly redevelop a project concept for the program. As of this writing, consultations with government partners are still in progress.

1.3 METHODOLOGY AND LIMITATIONS

DATA COLLECTION

As primary data collection and stakeholder engagement has been severely limited due to travel and health restrictions related to the novel coronavirus (COVID-19) pandemic, the consultant team relied extensively on secondary data and qualitative field observations from local experts. These methods and sources include:

- literature reviews of relevant urban resilience journal articles, including technical assistance reports provided by the associated TA-9513;
- policy reviews of relevant national and subnational regulations;
- analysis of quantitative data from the Government of Indonesia, including Statistics Indonesia (BPS), the Integrated Social Welfare Database (DTKS); and baseline data from the City without Slums Program (KOTAKU);
- analysis of geospatial data from governments and various open-source data using ArcGIS and ur-scape; and
- qualitative field observations from the team's local experts based in each city.

In addition to research limitations imposed by COVID-19, the report's findings are limited by the availability and reliability of existing datasets.[3] Throughout, the report attempts to make clear where information is missing or less reliable.

CITY ANALYSIS FRAMEWORK

In efforts to gain a comprehensive and multidimensional understanding of each potential pilot city, the LSIP consultant team developed a city analysis framework to assist with project concept development. The city analysis framework includes three components:

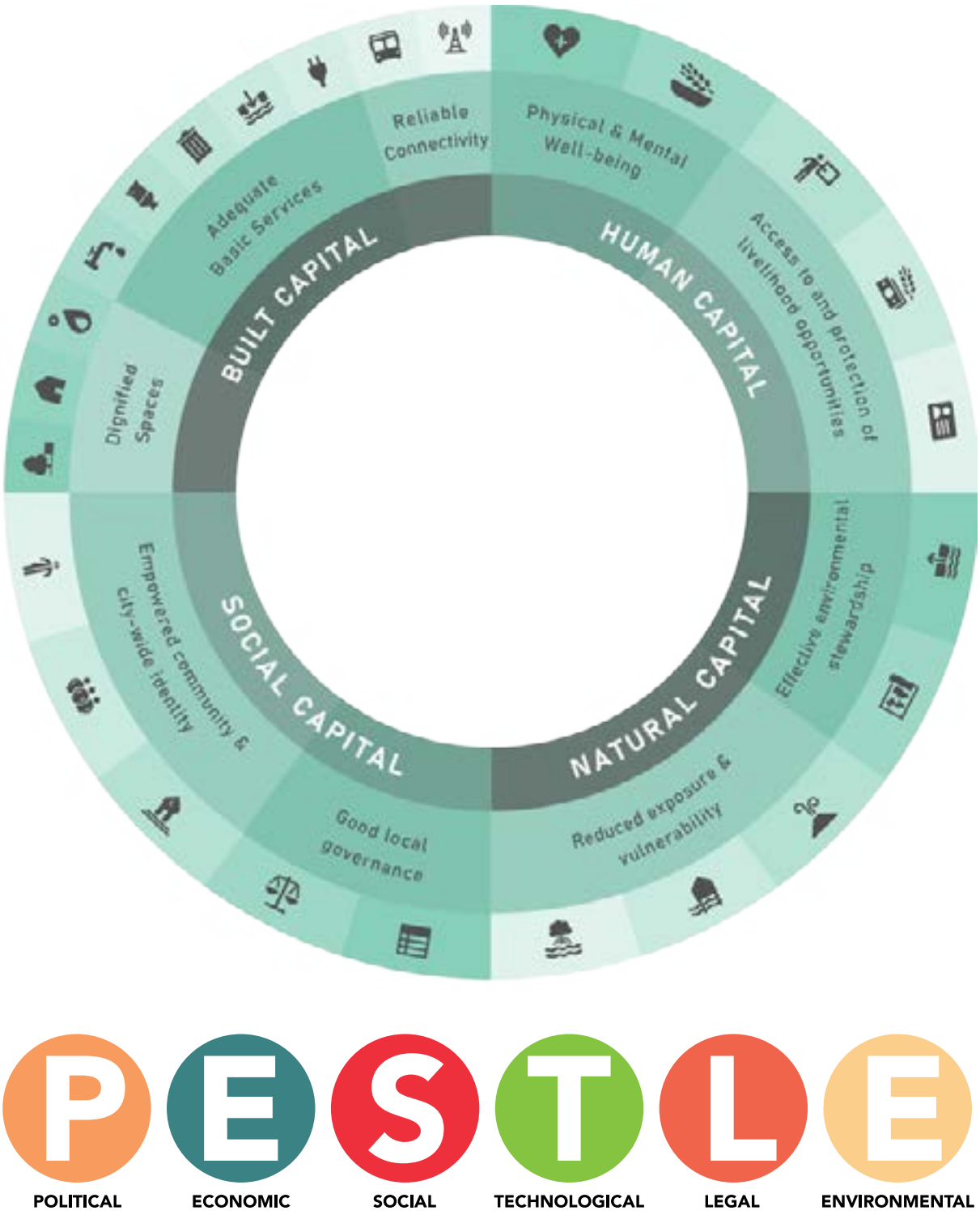
1. Framework: To structure the project's data collection and presentation, the framework divides a city into four dimensions for investment: built, human, natural, and social. Each dimension is further subdivided, with a total of nine goals and 25 solutions for investments. (Figure 1.1)

2. Assessment: To conduct stakeholder consultations across these areas, the framework then translates these dimensions, goals, and solutions into an initial rapid assessment, intended for local stakeholders such as governments and communities.

3. Analysis: To analyze solutions, the framework incorporates PESTLE,[4] an analysis that examines external factors that would influence potential investments or solutions.

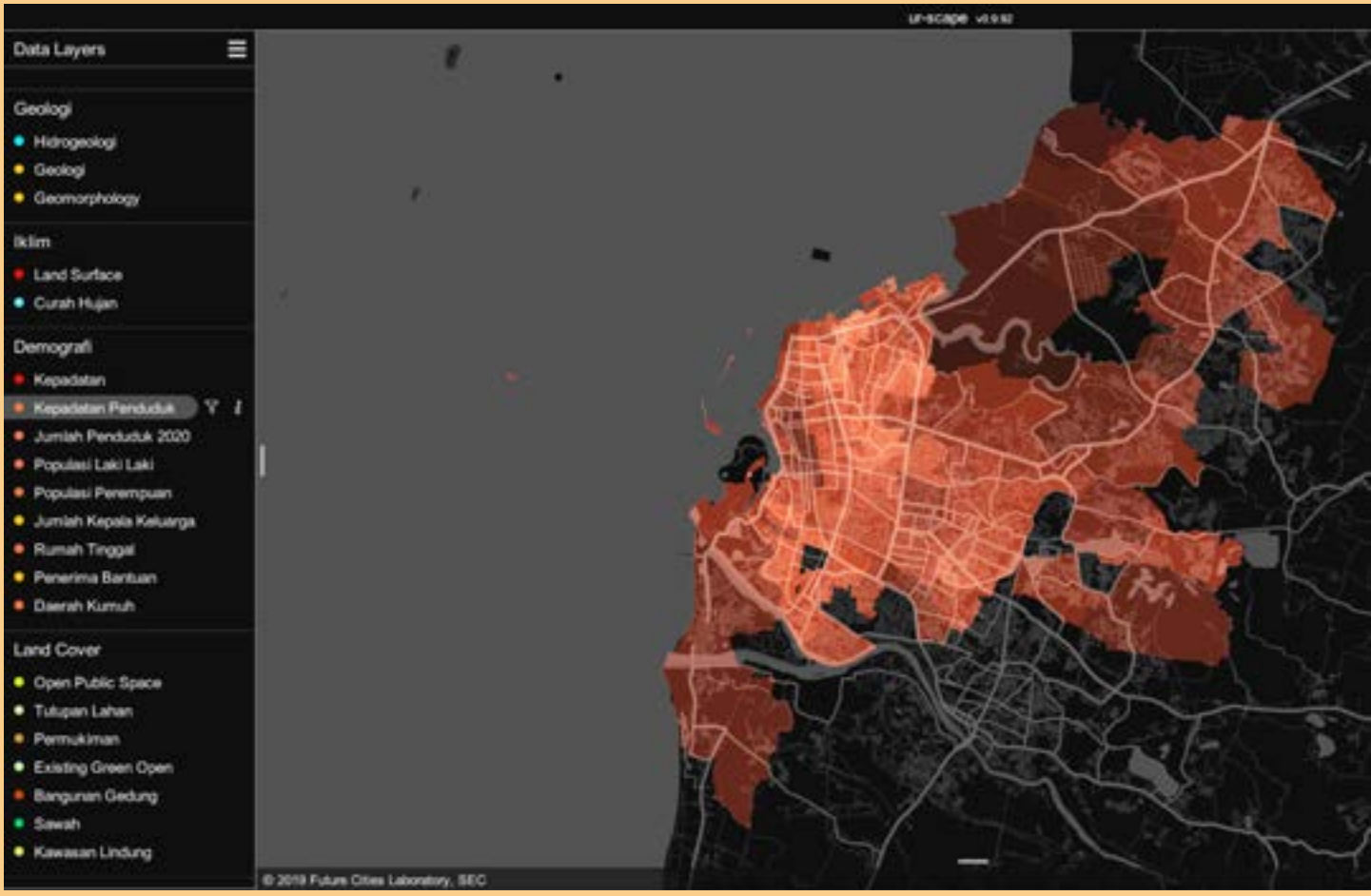
The consultant team is currently piloting the framework to structure this report. The team intends to pilot the initial rapid assessment and PESTLE analysis components in future project stages. An associated ADB consultant team is currently piloting a version of the initial assessment in Makassar.

3. In Cirebon City, KOTAKU geospatial data for four slum areas were unavailable.
4. PESTLE traditionally analyzes the Political, Economic, Social, Technological, Legal, and Environmental factors influencing a proposed policy or program.



Source: authors

Figure 1.1 City Analysis Framework



1.4 ABOUT UR-SCAPE

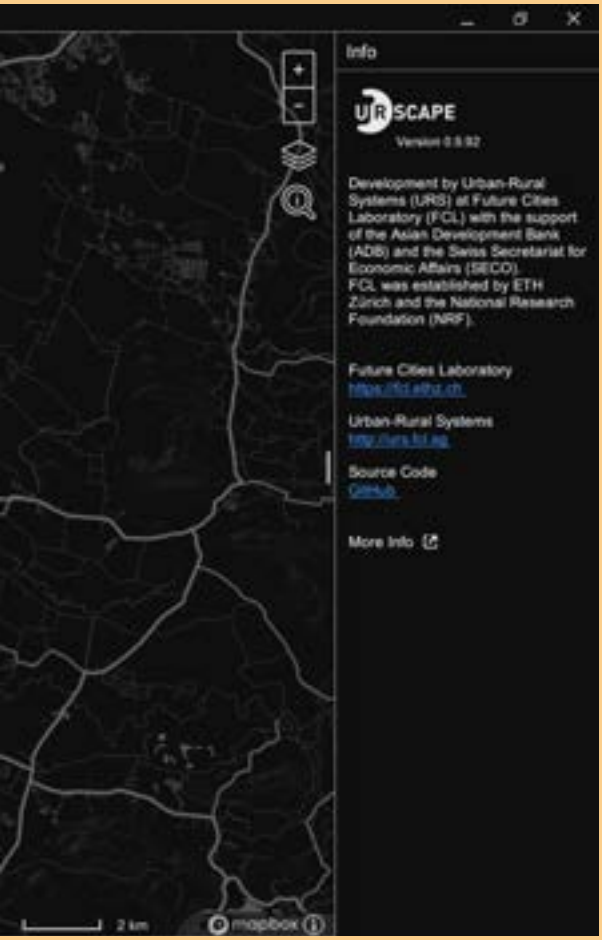
ur-scape is an open-source spatial planning tool designed to support sustainable futures in rapidly developing urban and rural regions, where data is often difficult to access and uneven in quality and where development needs are especially urgent and challenging. ur-scape does this by bringing diverse kinds of data together and encouraging people to explore the data intuitively and in real-time.

ur-scape helps city makers—be they governments, businesses, or communities—improve the quality of planning and design decisions. It helps develop livable neighborhoods; build responsive towns; reduce city 'stress points' (e.g., flooding, traffic snarls, poverty); enhance 'sweet spots' (e.g., accessibility, equity, economic vibrancy); and progress toward strategic development goals (e.g., regional, national, and SDGs).

Developed by the Urban-Rural Systems (URS) team at Future Cities Laboratory (FCL), ur-scape is supported by ADB and the Swiss Secretariat for Economic Affairs (SECO). Pilot implementation of the ur-scape tool is supported by the municipal planning authorities of the city of Bandung, the Indonesian Ministry of Agrarian Affairs and Spatial Planning (MoASP), and the Bauhaus Weimar University.

Data import to ur-scape is supported by a third-party software called QGIS. It is a free and open-source cross-platform desktop geographic information system application that supports viewing, editing, and analysis of geospatial data. ur-scape can accommodate data in raster format (geoTIFF) and vector format (shapefile).

With support from ADB, World Bank, and SECO, ur-scape has been piloted and is currently used in the following cities: Bandung, Makassar, Palembang, and Semarang, Indonesia; and HCMC, Vietnam. Makassar City has also received a series of trainings on how to use ur-scape through previous ADB and FCL engagements in the city. ur-scape has been employed to some extent by city departments and installed in the city's "war room." It is currently used to analyze the spatial pattern of COVID-19 transmissions in the city.



UR-SCAPE FOR LIVABLE CITIES

In the context of the Livable Settlements Investment Project, ur-scape spatial data analysis is used to support citywide situation assessments of Cirebon City and Makassar City, based on site observations, secondary data aggregations, and literature reviews. Various data layers are cross-analyzed and intersected to identify vulnerable locations, including slums and urban poverty, and reveal potential challenges such as environmental quality, disaster risk, access to basic infrastructure and services, mobility using a combination of the best available data acquired from public domain, local governments, and the national slum upgrading program, KOTAKU. Data formats include geoTiff, shapefile, and CSV, comprising data of various administrative levels (*kelurahan* and *kecamatan*) as well as slum area (kawasan kumuh).

ADB and FCL intend to share the consolidated and updated databases with respective cities of Cirebon and Makassar upon completion of the assessments through digital data-transfer.

More about ur-scape:
https://ur-scape.sec.sg/en/home

Left: ur-scape interface. Highlighted area in red indicates population density of Makassar.
Top Right: ur-scape workshop in Singapore.
Bottom Right: ur-scape workshop in Makassar.
Source: authors

(FCL) FUTURE CITIES LABORATORY

UR

The entrance to one of Cirebon City's historic palaces, Keraton Kasepuhan. Asian Development Bank.

CHAPTER 2

CITY OVERVIEW

Cirebon City is a port city on the northern coast of Java, located at an estuary where four rivers meet the Java Sea. Natural sedimentation forms a river delta along its coast. In popular folklore, the name Cirebon is said to have evolved from Caruban or Cai Rebon, *cai* meaning "salt water" and *rebon* meaning "shrimp." In 1946, Cirebon was officially nicknamed "Shrimp City" in reference to its history as a major shrimp fishery.

2.1 VISION: "A CREATIVE CITY BASED ON CULTURE AND HISTORY"

Cirebon City envisions itself as a creative city based on culture and history.[1] This vision aims to fulfill basic needs in order to promote prosperity, character, culture, and high economic competitiveness. The vision is further aligned with the National Medium-Term Development Plan (RPJMN) of 2020-2024 and the vision of the Government of West Java Province. To realize this developmental vision, the city has four missions:

- develop human capital that is competitive, cultured, and excellent in all sectors;
- achieve transparent, accountable, authoritative, and innovative governance;
- improve the quality of environmental facilities and infrastructure and optimize the potential for sustainable management of natural resources; and
- achieve peace and public order.

Focusing on tourism development as the key strategy for regional economic development, in 2019, the city government introduced a slogan to rebrand the city as "The Gate of Secret."[2] In line with the city vision and missions, the slogan aims to capture the idea that all art and culture in Cirebon City, from traditions to artwork and buildings, have deep philosophical meaning that illustrates the journey of human life.

2.2 LOCATION

Cirebon City is strategically located on the northern coast of Java Island at 6°42'26"S, 108°33'27"E, spanning approximately 11 km from east to west (Figure 2.1).[3] The city is approximately 260 km east of Jakarta and serves as a major transportation hub between West Java and Central Java. Administratively, the city covers 37.4 sq km (3,736 ha) and is divided into five subdistricts (*kecamatan*) and 22 urban villages (*kelurahan*), surrounded by the suburbs of Cirebon Regency. Cirebon City is bordered on the north by the Kedung Pane River; the south by the Kalijaga River; the east by the Java Sea; and the west by the Banjir Kanal River.

2.3 HISTORY

Modern-day Cirebon City is thought to have begun in the mid-15th century as a fishing port called Muara Jati, which was part of the Sunda Kingdom in West Java. Its independence shortly after is credited to Sunan Gunung Jati, founder of the Islamic Sultanate of Cirebon and one of the nine revered saints (*Wali Songo*).[4] Throughout the 16th and 17th centuries, the Cirebon sultanate was a major center of trade and commerce, bringing a diverse mix of migrants from various cultures including Sundanese, Javanese, Chinese, and Arab. These cultural influences are still evident in modern-day Cirebon's language and customs. The sultanate later split into four separate lines of royal succession, evidenced today by the four historic palaces *(keraton)* that still stand: Keraton Kasepuhan, Keraton Kanoman, Keraton Keprabonan, and Keraton Kacirebonan.

2.4 GEOGRAPHY

Cirebon City has an elevation of approximately 0-200 m above sea level. Its topography has four types of grade: 1) 0-3% grade; 2) 3-8% grade; 3) 8-15% grade; and 4) 15-18% grade.[5] The city mostly

1. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) *2018-2023*. Cirebon City.
2. Government of Cirebon City. 2019. Mayoral Decree (SK) No 430/2019 on Branding Determination for Cirebon City.
3. Government of Cirebon City. Official website: "About Cirebon" (accessed 4 March 2021).
4. Bowring, P. 2019. *Empire of the Winds: The Global Role of Asia's Great Archipelago*. p. 159.
5. Cirebon City Department of Housing and Settlements. 2017. *Slum Prevention and Quality Improvement Plan* (RP2KPKP). Cirebon City.

consists of lowlands with some highlands in the southern part of the city in Kelurahan Argasunya, Kecamatan Harjamukti, approximately 4 km from the city center. Kelurahan Argasunya also has the largest land area at 675 ha, of which 42% (286 ha) are plantation and rice fields.[6] Four large rivers flow north to the Java Sea and constitute the city's primary drainage system: Kedung Pane River, Sukalila River, Kesunean (Kriyan) River, and Kalijaga River. Approximately 30 km southwest of the city is Mount Ciremai, a major stratovolcano that marks the highest point in West Java, reaching 3,078 m (10,098 ft) above sea level.

2.5 CLIMATE

Like much of Indonesia, Cirebon City has two seasons: rainy and dry. Generally, Cirebon is a tropical region with an average air temperature between 22.3°C and 33.0°C, though humidity varies between 48% and 93%.[7] Average annual rainfall is 2,260 mm per year, with approximately 155 days of rain. Rainy season falls between October and April, while dry season falls between June and September.

2.6 POPULATION

Cirebon City has a registered population of 341,725 people although its greater metropolitan area has an estimated population of 2.5 million.[8] Its registered population growth rate was 0.82% in 2019.[9] The city's male and female populations are roughly equal and have remained so over the past decade. The average population density is 9,111 persons per sq km, with the highest density of 20,251 person per sq km in Kecamatan Pekalipan. In 2019, the youth population was 84,424, approximately 25% of the total population.[10]

2.7 HUMAN DEVELOPMENT

Based on the Human Development Index (IPM) developed by the United Nations Development Program, Statistics Indonesia (BPS) publishes an annual, statistic composite index of life expectancy, education, and per capita income indicators at the subnational level.[11] Between 2010 and 2020, the IPM for Cirebon City has been in the high category and has steadily increased from 70.7 to 74.9, though progress has slowed.[12]

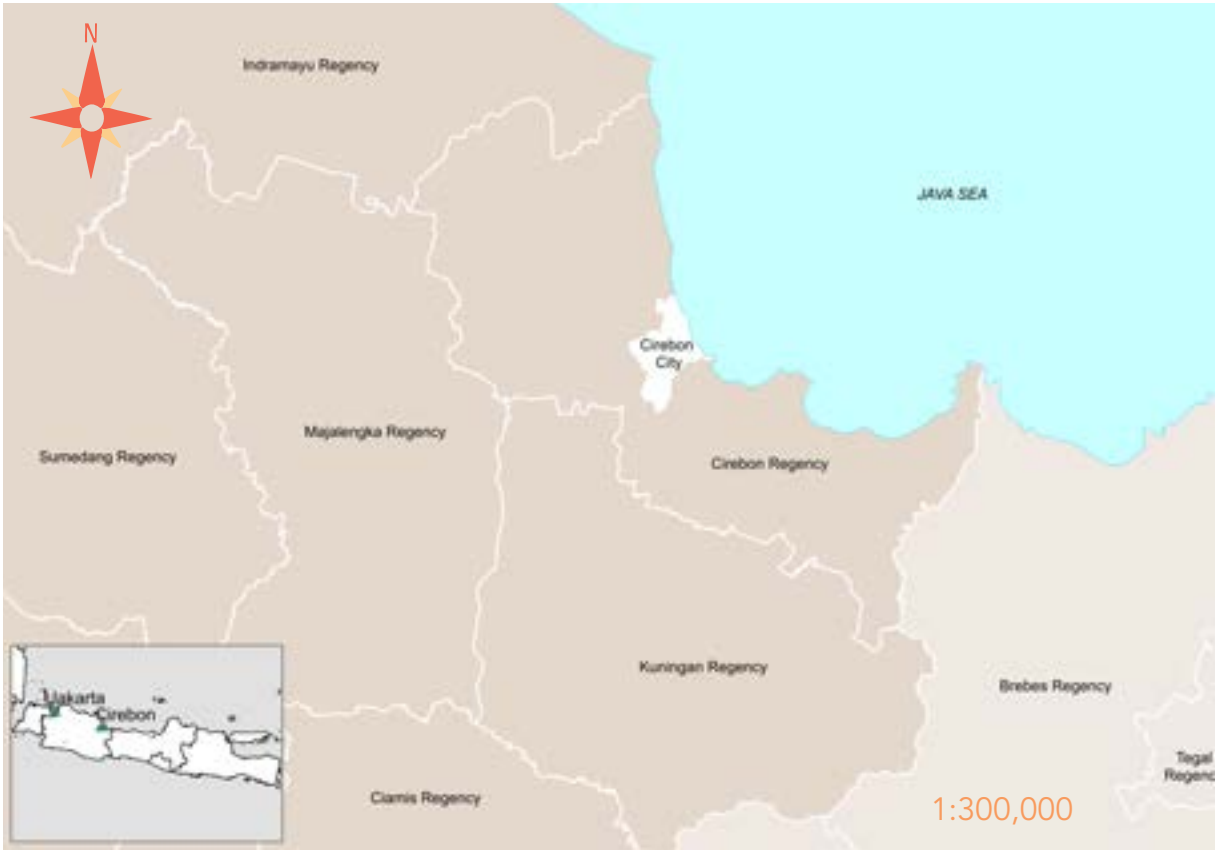
2.8 POVERTY

As measured by the national poverty line, since 2010, the urban poverty rate in Cirebon City has fallen faster than in Indonesia overall. Between 2010 and 2020, the number of poor individuals decreased from 12% (35,500) to 10% (30,610) of the total population.[13] However, the Ministry of Social Affairs' (MoSA) Integrated Social Welfare Database (DTKS) shows that 122,475 Cirebon individuals were in the bottom 40% of national income distribution and receiving social assistance in 2020 (Figure 2.2)[14] This poverty figure is four times that based the national poverty line. Furthermore, data from the Office of National Population and Family Planning's (BKKBN) Family Welfare Levels (*Tingkat Kesejahteraan Keluarga*) show that 71% of Cirebon families were classified as Very Poor, Poor, Near Poor, or Vulnerable to Poverty in 2020.[15] More than half of these families could not meet basic and psychological needs. These figures suggest that the national poverty line may not capture the true number of urban poor.

2.9 ECONOMY

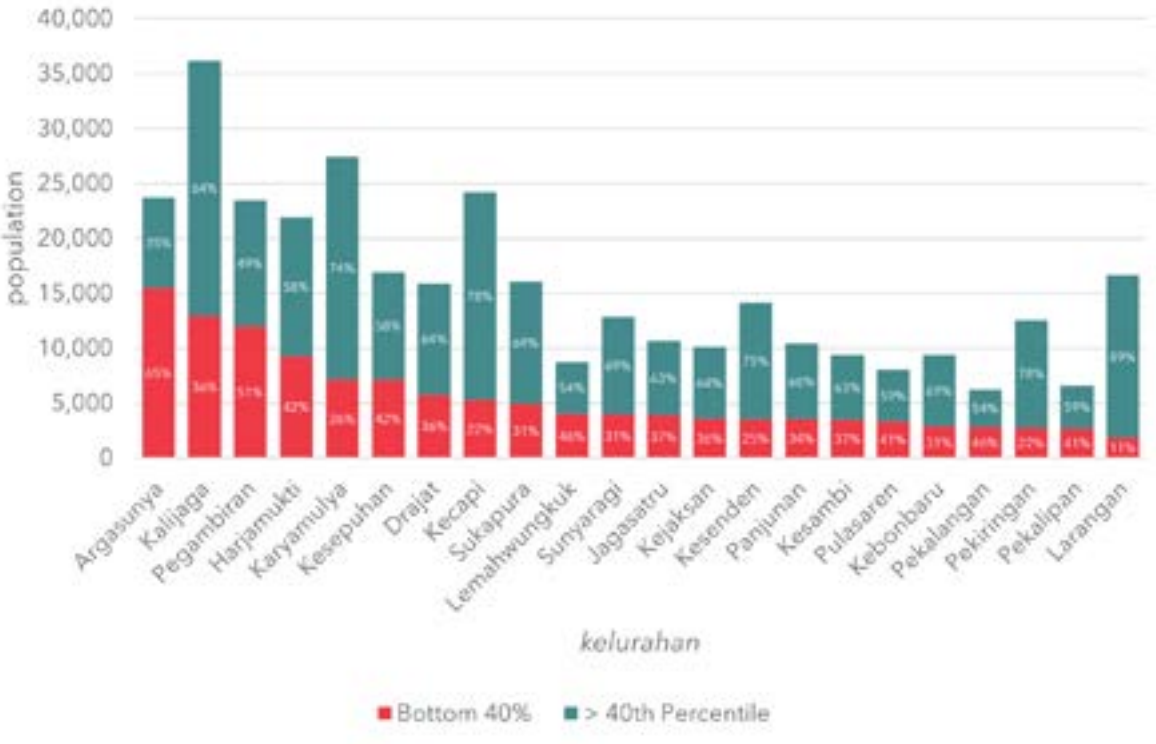
Between 2010 and 2019, Cirebon City's average annual growth rate was 5.8%.[16] On average, the three fastest growing industries were: 1) information and communications (10.9%); 2) health and social services (9.3%); and 3) education (9.0%) (Figure 2.3). In 2019, the city's economy grew by 6.3% from

6. IAIN Syekh Nurjati Cirebon. 2011. *Existing Conditions of Kelurahan Argasunya* (accessed 18 February 2021).
7. Cirebon City Department of Housing and Settlements. 2017. *Slum Prevention and Quality Improvement Plan* (RP2KPKP). Cirebon City.
8. Cirebon City Department of Population and Civil Registration. 2020. Demography *(Demografi)*. Cirebon City.
9. Statistics Indonesia (BPS) Kota Cirebon. 2020. *Cirebon City in Figures 2020*. Cirebon City.
10. Government of Cirebon City. 2019. *Cirebon Satu Data*: Number of youths in 2019 (accessed 1 February 2021).
11. Statistics Indonesia (BPS) Kota Cirebon. 2015. *BPS Database*: Human Development Index (accessed 10 March 2021).
12. Ibid. For subnational level IPM, the categories are: IPM <60 = Low HDI; 60≤ IPM <70 = Moderate HDI; 70≤ IPM <80 = High HDI; and IPM >80 = Very High HDI.
13. Statistics Indonesia (BPS) Kota Cirebon. 2020. *Cirebon City in Figures 2020*. Cirebon City.
14. Ministry of Social Affairs (MoSA). 2020. "Distribution of the Number of DTKS for October 2020 based on Ministrial Decree of Social Affairs (SK Menteri) No.146/2020" (accessed 4 March 2021).
15. Cirebon City Department of Population and Civil Registry. 2020. Welfare (*Kesejahteraan*); Demography (*Demografi*). Cirebon City.
16. Calculations based on *BPS Database*: GRDP at constant prices based on industry, 2010-2019 (accessed 21 April 2021). Cirebon City.



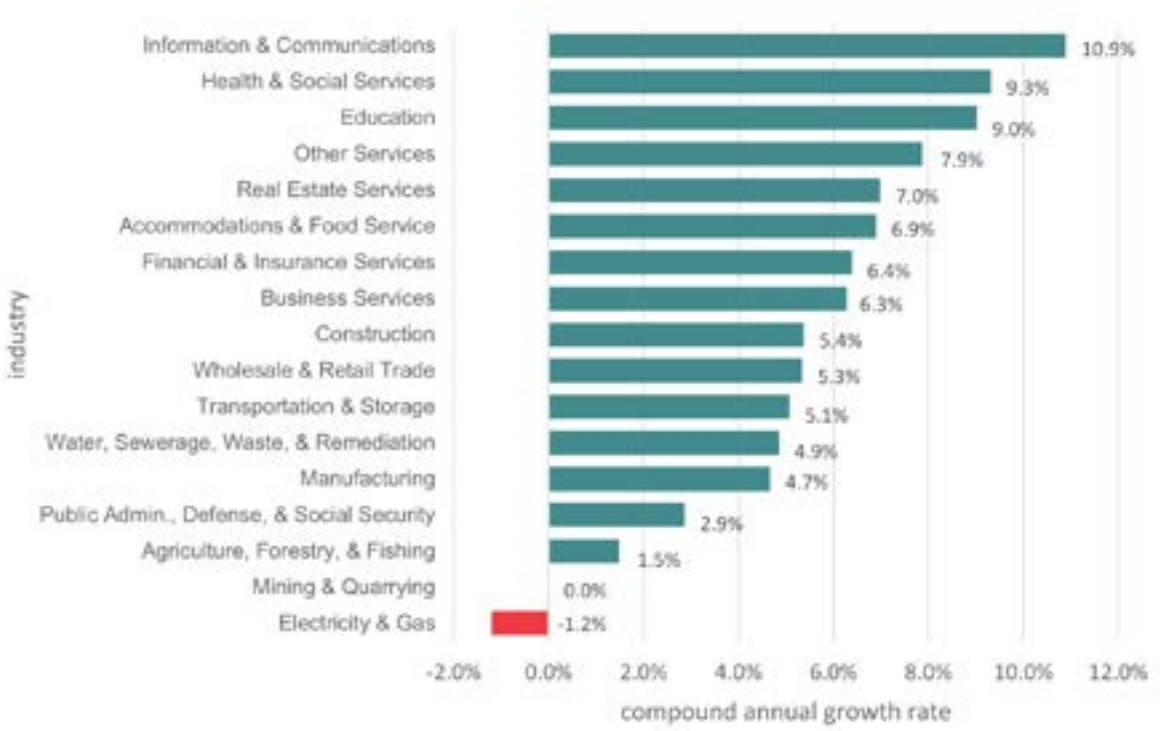
Source: Cirebon City BP4D (2018).

Figure 2.1 Cirebon City and surrounding regencies



Source: MoSA (2020).

Figure 2.2 Cirebon City population in the bottom 40% of national income distribution in 2020



Source: authors

Figure 2.3 Average annual growth rate of industries in Cirebon City between 2010 and 2019

2018, reaching US$1.6 billion (Rp23.5 trillion),[17] with a per capita Gross Regional Domestic Product (GRDP) of approximately US$4,900 (Rp68.9 million). By contribution to GRDP, the top three industries in 2019 were: 1) wholesale and retail trade, including repair of motor vehicles and motorcycles; 2) transportation and storage; and 3) financial and insurance services.[18] These data suggest the growing importance of the service economy in Cirebon City.

2.10 ENVIRONMENT

Overall environmental trends in Cirebon City are poor, with only water quality meeting Satisfactory levels. Using national indices, the Department of Environment (DLH) conducts an annual assessment of city level environmental conditions, including environmental quality, water quality, air quality, and land cover (Figure 2.4).[19] While environmental quality between 2014 and 2018 declined from 54.3 to 44.1 (Poor to Very Poor), by 2019, it had slightly improved to 52.0 (Poor).[20] Water quality likewise improved from 50.0 to 56.9 (Satisfactory) between 2014 and 2019.[21] However, air quality noticeably declined from 90.0 to 68.6 (Good to Poor) between 2014 and 2019,[22] and although land cover improved from 30.6 to 35.8 between 2014 and 2019, it remains in the Dangerous category.[23]

2.11 URBAN DEVELOPMENT

DEVELOPMENT TRENDS

Between 1989 and 2014, Cirebon City's urban extent increased an average of 6.0% annually.[24] Though only 19% of the city's administrative area was urban in 1989, by 2000, this figure had increased to 42%. By 2014, 80% of the city was urban.

CONNECTIVE INFRASTRUCTURE. Cirebon City's urban development reflects its strategic geographic position on Java

17. Statistics Indonesia (BPS) Kota Cirebon. 2020. *Cirebon City in Figures 2020*. Cirebon City. 2019 GRDP at current prices.
18. Ibid.
19. The Environmental Quality Index is a statistic composite index of the following indicators: river water quality, air quality, and land cover. Excellent = >80; Good = 71-80; Satisfactory = 61-70; Poor = 51-60; Very Poor = 41-50; Dangerous = <40. Changes in land cover, especially of undeveloped to built-up areas, are monitored to assess the effectiveness of environmental management policies.
20. Cirebon City Department of Environment . 2019. *Cirebon City Environmental Quality Index 2019*. Cirebon City; Government of Indonesia. 2019. *Environmental Quality Index 2019*. Jakarta.
21. Ibid.
22. Ibid.
23. Ibid.
24. Calculations based on *Atlas of Urban Expansion*: Cirebon (accessed 9 April 2021).

Source: Cirebon City Department of Environment (2019).

Figure 2.4 Enviromental indices in Cirebon City between 2014 and 2019

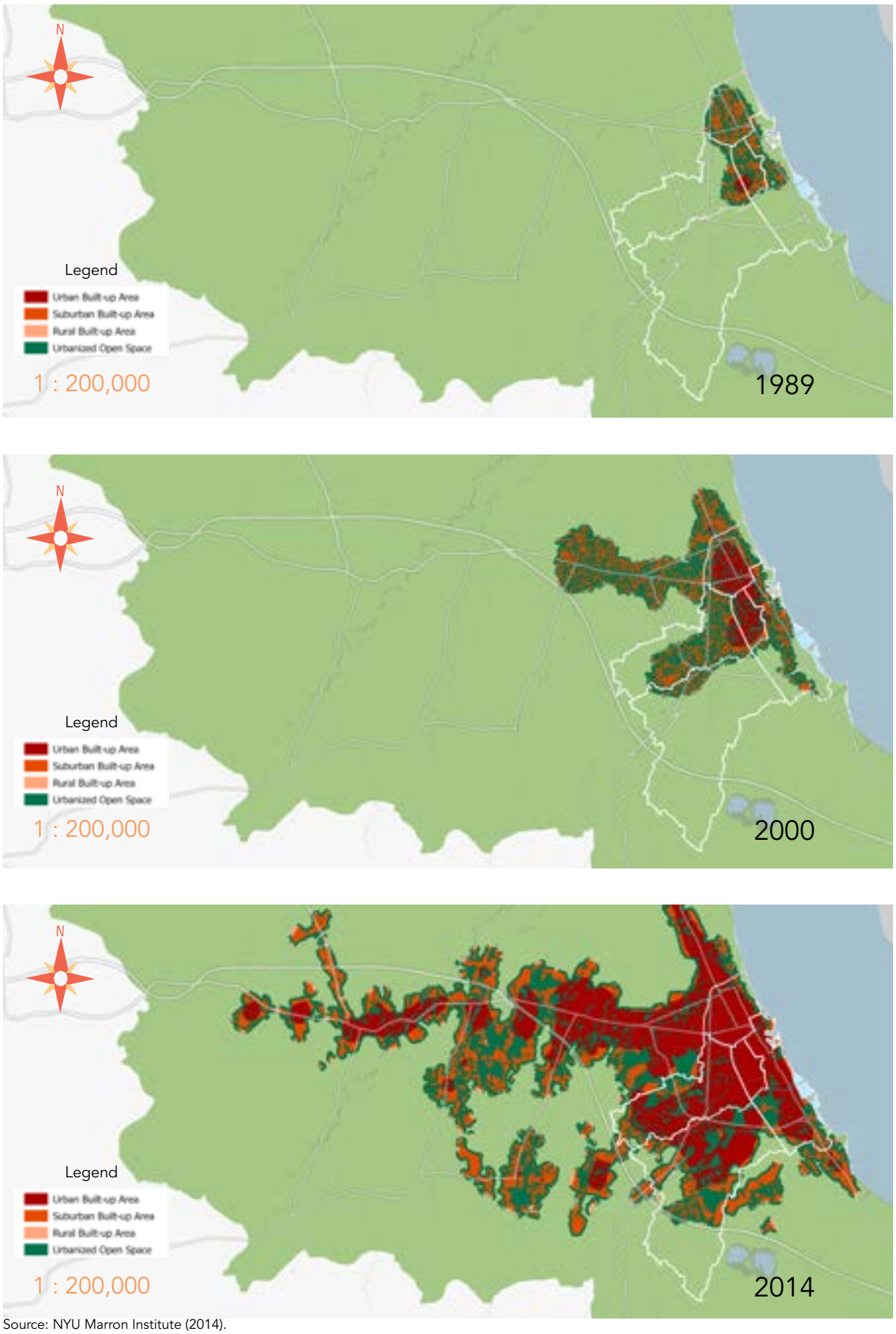
Island and supporting connective infrastructure. In addition to its location on the northern coast of Java, the city borders Central Java and is considered the gateway to West Java. Primary arterial and collector roads connect the city to Jakarta and other major cities in the region. Urban expansion maps show that the city's urban extent has largely followed major roadways (Figure 2.5).[25] In recent years, the Cirebon area has also benefited from multiple toll roads, passenger railways, and cargo rail transport.

The city's strategic location and connective infrastructure has created incentives for private real-estate development. Mixed-use developments target middle- to upper-class families, expatriates, and even millennials.[26] CitraLand Cirebon, built on 40 hectares in Kecamatan Harjamukti, features a commercial district, private sports facilities, education facilities, and over 600 new townhome units.[27] Taman Cipto, a planned housing development in Kecamatan Kesambi, features large single-family homes. Several other private real-estate developers have also constructed similar planned housing developments in recent years. Infrastructure development and economic development have thus been mutually reinforcing.

LAND RECLAMATION.Cirebon's urban development also reflects its natural geography. Like many other historic port cities in Indonesia, Cirebon is an estuarine city. Four rivers flow through the city out to the Java Sea, creating a river delta along the coastline where natural sedimentation occurs. Although high sedimentation has contributed to the increase in city land area, this natural phenomenon has also created opportunities for informal land reclamation using solid waste (detailed in Chapter 3). As this type of land use is still unregulated, slums continue to develop along the coast, discouraging recreational use of city beaches due to concerns regarding sanitation.[28] Coastal slum development has also decreased fish catch for local fishermen due to environmental degradation of marine habitats.[29]

Furthermore, 88% of the city area is in lowland areas which negatively impacts urban infrastructure services, particularly drainage and water supply. [30] Because of the naturally slight grade, during periods of flooding, water is slow to drain, especially in areas with inadequate drainage channels. Moreover, as the city's water supply system relies largely on gravitational force,

25. New York University. 2014. *Atlas of Urban Expansion*: Cirebon (accessed 9 April 2021).
26. KOMPAS. 2020. "Citraputra releases two new types of houses" (accessed 4 March 2021).
27. CitraLand Cirebon. "Concept of CitraLand Cirebon" (accessed 4 March 2021).
28. Interviews with city agencies. 26-28 February 2020.
29. Cirebon City Department of Housing and Settlements. 2017. S*lum Prevention and Quality Improvement Plan (RP2KPKP)*. Cirebon City.
30. ur-scape. 2021. *Cirebon City Database*. Future Cities Laboratory. Singapore.



Source: NYU Marron Institute (2014).

Figure 2.5 Urban extent of Cirebon metropolitan region in 1989, 2000, and 2014

the low slope makes it difficult to create enough water pressure to supply adequate amounts of drinking water to coastal areas (detailed in Chapter 4).

FLOODING. The conversion of permeable land into impermeable surfaces has also negatively impacted the city, especially in lowland areas. Conversion of paddy fields into residential and industrial uses threatens agricultural production and food security in Cirebon City.[31] Deforestation in highland areas such as Mount Ciremai has increased the level of sedimentation of the river delta, thereby contributing to more frequent flooding.[32] The city government has also identified several environmental trends: 1) limited green open space, both public and private; 2) environmental degradation characterized by a decrease in water quality, air quality, and environmental pollution; 3) suboptimal waste management system; 4) reduction in public green open space because of real-estate development; 5) damaged mangrove forests; and 6) increased land use change and climate variability.[33]

POLICY AND PLANNING FRAMEWORK

Several key policies and plans guide urban development in Cirebon City (Appendix 5).

- The RPJMD is the Regional Medium-Term Development Plan, a key city-level planning document that references the RPJMN, the national policy document that sets priorities and lists major projects over a five-year period. Cirebon City's current RPJMD guides development from 2018 to 2023 and references the RPJMN 2020-2024.
- The Medium-Term Infrastructure Investment Program Plan (RPIJM) is a five-year, city-level infrastructure planning, financing, and investment document that refers to the RTRW.[34] Cirebon City's current RPIJM is active from 2017 to 2022
- The General Spatial Plan (RTRW) is a key, multi-level planning document that guides long-term urban development in provinces and districts. Cirebon City's current RTRW guides city development from 2011 to 2031.
- The Detailed Spatial Plan (RDTR) is a city-level planning document that regulates land use, density, and allowable development activities in certain areas. The RDTR will reference Cirebon City's RTRW and is supplemented by zoning regulations *(Peraturan Zonasi)*. As of this writing, the RDTR is still in progress.
- The Housing and Settlements Development Plan (RP3KP) is a multi-level planning document meant to guide housing activities. The city-level RP3KP is meant to reference its respective provincial-level RP3KP. Currently, city government has not yet prepared this document as the West Java RP3KP is still in progress.
- Key slum policies (detailed in Chapter 3), such as the Mayoral Decree on Slums (SK Kumuh) and the Slum Prevention and Quality Improvement Plan (RP2KPKP) will in turn reference the RP3KP.

INSTITUTIONAL ARRANGEMENTS

The city government comprises an executive branch, headed by the elected mayor and deputy mayor, along with a legislative branch of elected councilmembers (DPRD). The executive body is primarily responsible for policymaking and policy implementation. Key departments and offices involved in urban development can be seen in Table 2.1 (detailed in Chapter 4).

DEVELOPMENT PLANS

NATIONAL. The Government of Indonesia has included Cirebon City in several national development plans

- The RPJMN 2020-2024 lists Cirebon City as a priority location in the No. 27 Strategic Priority Project, "Coastal Security of the 5 Cities on the North Coast of Java."[35]
- MPWH has listed Cirebon City as a priority area requiring support for Slum Alleviation and Prevention. DGHS has further listed Cirebon City as No. 34 in its list of "55 Priority Districts 2020-2024."[36]
- In 2017, MPWH designated Cirebon City as a National Activity Center (PKN).[37] MPWH plans to develop

31. Pilot4Dev. 2020. "Policy Brief based on the Urban Analysis Report for the City of Cirebon." Climate Resilient and Inclusive Cities Project. Jakarta.
32. Pratiwi et al. 2016. "Mainstreaming gender in climate change adaptation: A case study from Cirebon, Indonesia." *Asian Cities Climate Resilience Working Paper Series 39.* London.
33. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan (RPJMD)* 2018-2023. Cirebon City.
34. Ministry of Public Works and Housing (MPWH). "Medium-Term Infrastructure Investment Program Plan (RPIJM)" (accessed 5 March 2021).
35. Government of Indonesia. 2020. Presidential Regulation *(Perpres)* No. 18/2020 on National Medium-Term Development Plan (RPJMN) 2020-2024. Jakarta.
36. Directorate General of Human Settlements. 2020. *Determination of the Development of 55 Priority Districts/Cities 2020-2024.*
37. Ministry of Public Works and Housing (MPWH). 2017. "Urban Area Development Center Data Center" (accessed 4 March 2021).

Agency	Level	Mandate
Regional Development Planning, Research and Development Agency (BP4D, *Badan Perencanaan Pembangunan, Penelitian dan Pengembangan Daerah*)	City	Lead agency for all urban development
Department of Public Works and Spatial Planning (DPUPR, *Dinas Pekerjaan Umum dan Penataan Ruang*)	City	Raw water; sanitation and wastewater; and stormwater and drainage
Department of Housing and Settlements (PERKIM, *Dinas Perumahan Rakyat dan Kawasan Permukiman*)	City	Slum upgrading
Department of Environment (DLH, *Dinas Lingkungan Hidup*)	City	Solid waste management

Source: Mayoral Regulation *(Perwal)* No.48/2016; Mayoral Regulation *(Perwal)* No.14/2018; Mayoral Regulation *(Perwal)* No.55/2016; Mayoral Regulation *(Perwal)* No.49/2016.

Table 2.1 Institutions of Cirebon City with urban development mandate

No.	Name	Strategy	Interest	Location
1.	Port of Cirebon Strategic Area (Kawasan Strategis Pelabuhan Cirebon)	Regional economic growth	Economic	Kecamatan Lemahwungkuk
2.	Kejawan Archipelago Fishing Port (Kawasan Strategis Pelabuhan Perikanan Nusantara Kejawanan)	Fishing area, fish market, and marine tourism destination	Economic	Kecamatan Lemahwungkuk
3.	Mount Sari-Cipto Strategic Area (Kawasan Strategis Gunung Sari-Cipto)	New commercial center	Economic	Kecamatan Kesambi
4.	Ciremai Raya Strategic Area (Kawasan Strategis Ciremai Raya) City	New residential area	Economic	Kecamatan Harimukti
5.	Cirebon Palace Strategic Area (Kawasan Strategis Keraton Cirebon)	Cultural heritage area and tourism destinations	Social	Kecamatan Lemahwungkuk
6.	Sunyaragi Cave Strategic Area (Kawasan Strategis Gua Sunyaragi)	Cultural heritage area and tourism destinations	Social	Kecamatan Kesambi
7.	Majasem Strategic Area (Kawasan Strategis Majasem)	Education and science	Social	Kecamatan Kesambi
8.	Argasunya-Kalijaga Strategic Area (Kawasan Strategis Argasunya-Kalijaga)	Education and science	Social	Kecamatan Kesambi

Source: Cirebon City RTRW 2011-2031.

Table 2.2 Areas of strategic economic and social interest

Cirebon as a port city as well as a center for trade, industry, and tourism. The city is expected to serve as a hub for the collection and distribution of manufactured and handcrafted products from the city itself and from surrounding regions.

PROVINCIAL.The provincial government of West Java is developing a new urban industrial region in northeastern West Java called Rebana Metropolitan. By 2030, the provincial government aims to reach an economic growth rate of 10% and create 4.3 million new jobs by attracting and developing a network of industrial centers across the regencies.[38] Although Cirebon City is not officially included in the Rebana development area, the city is expected to benefit from infrastructure development in the region.

In Cirebon Regency, the provincial government is proposing 1,800 hectares of development, for industries such as fishery processing, shipbuilding, furniture, and building materials.[39] To support new industry, it is seeking investment for new utilities infrastructure, including:

- Jatigede Water Treatment Plant, a project that would supply and sell water to Local Water Corporation (PERUMDAM) in five districts, including Cirebon City;
- Greater Cirebon Waste Treatment Plant, a project that would produce refuse-derived fuel (RDF) by processing solid waste from five districts, including Cirebon City;
- Greater Cirebon Wastewater Treatment Plant; and
- Cirebon Integrated Waste Treatment Plant Unit.

LOCAL. The Cirebon City Government has stated that tourism is the most important sector for urban development of the city.[40] In addition to rebranding itself as "The Gate of Secret," the city is keen to develop its historic city center *(kota lama)*, *keraton*, and traditional markets for tourism. The city has also begun mangrove restoration for coastal protection and eco-tourism, as well as development of a batik village and handicrafts from recycled plastic. The city has further been experimenting with alternative options for public green open spaces (detailed in Chapter 4).

Cirebon City's RTRW 2011-2031 designates eight areas of strategic economic and social interest (Table 2.2). While the city has made detailed plans for some of these strategic projects, tangible progress has not yet been made.

PORT OF CIREBON DEVELOPMENT. The Port of Cirebon is a branch company of the state-owned enterprise, Indonesia Port Corporation (IPC, PT Pelabuhan Indonesia II). IPC operates a 48-ha area in Kecamatan Lemahwungkuk, where it mainly imports coal, liquid asphalt, and vegetable oils destined for West Java. In 2014, it exported about 10,000 containers per month of textiles, rattan, and agricultural products to Europe and Asia.[41] IPC plans to expand its Cirebon operations in three phases with 334.5 ha of land reclamation. As of this writing, these plans have not yet been realized.[42]

PANJUNAN ESTUARY REDEVELOPMENT. The city government has completed detailed engineering design for redevelopment of the estuary in Kelurahan Panjunan, where the Sukalili River meets the Java Sea. The redevelopment area includes RW01 and RW10, the two neighborhoods in the Panjunan slum area (detailed in Chapter 3). The city has not yet secured budget allocations for the project.[43]

TOURISM DEVELOPMENT MASTER PLAN. Between 2019 and 2023, the city government will focus on development of tourist destinations, tourism industry, and tourism institutions (detailed in Chapter 7). Destinations include a main street along Jalan Siliwangi connecting the keraton to the tomb of the city's founder; a bridge across the Sukalili River; development of Kejawanan Beach and Kesenden Beach; and development of an Arab Village and Chinatown. The city government further plans to provide bins for waste sorting near tourist attractions.

38. Government of West Java Province. 2020. "Rebana Metropolitan: The Future of West Java" (accessed 3 February 2021).
39. Ibid.
40. Cirebon Smart City. 2019. Official website: "Cirebon City Government Branding Cirebon City as the Gate of Secret" (accessed 4 March 2021).
41. PT Pelabuhan Indonesia II (IPC). 2014. *Existing Conditions and Development Plans for the Port of Cirebon.* Cirebon City.
42. Radar Cirebon Televisi. 2021. "Cirebon Port Development" (accessed 5 March 2021).
43. Radar Cirebon. 2020. "City Goverment Targets Vacant Area along Panjunan Coast" (accessed 1 February 2021).

Solid waste blocks a drainage channel in Kelurahan Lemahwungkuk. Asian Development Bank.

CHAPTER 3

SLUM SETTLEMENTS

The Government of Indonesia defines slums as areas that do not meet physical infrastructure criteria in seven sectors: water supply, sanitation, solid waste management, drainage, roads, fire-protection, and housing.

At the city-level, neighborhood units (RT, *rukun tetangga*) are surveyed by household, measuring each household against 16 standardized indicators across the seven infrastructure criteria.[1] From this survey, a baseline percentage value is calculated for each indicator and then assigned a corresponding score of either 1, 3, or 5.[2] These scores are then totaled, and each *rukun tetangga* is assigned a corresponding level of High, Moderate, or Low to indicate the severity of slum conditions.[3]

Officially, there are also five slum types: 1) over water; 2) on the water; 3) in the lowlands, 4) in the highlands; and 5) in disaster-prone areas.[4] Other determining factors for slum area designation include strategic value of the location; social, economic, and cultural conditions; and land ownership.

3.1 SLUM LOCATIONS AND TYPES

The 2018 Mayoral Decree on Slums (SK Kumuh) has designated six areas of the city as slums,[5] administratively located in four *kecamatan* and eleven *kelurahan* (Table 3.1). The SK Kumuh further classifies slum areas according to their respective type: on the water (coastal); in the lowlands (historic city center); and in the highlands. To reflect the latest available slum data however, this report will instead reference 2020 figures from KOTAKU. The national slum upgrading program monitors slum development and produces annual updates to slum areas in each program city.

Coastal slum areas are located in Kecamatan Lemahwungkuk and Kejaksan and comprise 62% of the city's total slum area. These slum areas have been growing using land reclamation and are the city government's top priority for upgrading. Heritage slum areas are located in Kecamatan Pekalipan adjacent to cultural heritage sites in the city center, with some located on state-owned land belonging to the national rail company. These slums comprise 22% of the total slum area and are the city's second priority for slum upgrading. Highland slum areas are located in Kecamatan Harjamukti and comprise 16% of total slum area. These slums are the city government's lowest priority for development. [6]

1. Government of Cirebon City. 2017. Local Regulation (*Perda*) No. 9/2017 on Housing and Settlement Areas.
2. 1 = 24-50%; 3 = 51-75%; 5 = ≥75%. Zero if not applicable or less than 24%.
3. Out of a possible score of 80: High = ≥60; Moderate = 38-59; Low = 16-37; Not Slum = ≤15.
4. Government of Indonesia. 2018. Ministerial Regulation of Public Works and Housing (*Permen*) No. 14/2018 on Slum Upgrading and Prevention. Type 1 slums include those with stilt housing or similar structures. Type 2 slums include those with structures in riparian or coastal areas.
5. Government of Cirebon City. 2018. Mayoral Decree (SK) No.663/Kep.133-DPRKP/ 2018 on Revision and Verification of Slum Settlements Locations.
6. Calculations based on 2020 KOTAKU data.

Slum Type	No	Slum Name	Kecamatan	Kelurahan	Neighborhood	2018 Area (Ha)	2019 Area (Ha)	Total Area (Ha)
Coastal Area	1	Panjunan	Lemah-wungkuk	Panjunan	RW 1, RW 10	17.72	17.73	57.78
			Kejaksan	Kebonbaru	RW 1, RW 2, RW 3	22.00	17.42	
				Kesenden	RW 1, RW 10, RW 11	22.63	22.63	
	2	Kesunean	Lemah-wungkuk	Kasepuhan	RW 7, RW 8, RW 9	12.84	18.83	18.83
	3	Cangkol Utara		Lemahwungkuk	RW 4, RW 5, RW 6	14.78	15.10	15.10
	4	Pegambi-ran		Pegambiran	RW 2, RW 4, RW 5, RW 8, RW 9, RW 17	23.51	23.51	23.51
Total Coastal Slum Area						**113.48**	**115.22**	
Heritage Area	5	Pekalipan	Pekalipan	Pekalangan	RW 1-9	46.40	7.07	39.86
				Jagasatru	RW 1-10	31.96	14.23	
				Pulasaren	RW 1-8	25.39	7.15	
				Pekalipan	RW 1-12	33.86	11.41	
Total Heritage Slum Area						**137.61**	**39.86**	
Highland Area	6	Argasunya	Harjamukti	Argasunya	RW 1-11	64.82	29.87	29.87
Total Highland Slum Area						**64.82**	**29.87**	
Total Citywide Slum Area						**315.91**	**184.94**	

Source: Mayoral Decree (SK) No.663/Kep.133-DPRKP/2018.

Table 3.1 Slum Settlement Areas in Cirebon City

No	Criteria	Indicator	Description	Unit
1	**Security of Tenure**	Building	Refers to households that have a government-issued building permit (IMB) for their residential structure.	households (*rumah tangga*)
		Land	Refers to households that have a government-issued land title (SHM / HGB / *surat*) for their residential lot.	households (*rumah tangga*)
2	**Energy**	Potential usage	Refers to households' electricity tariff category. Used as a proxy measure for poverty, as households in tariff category <450 W receive government subsidized electricity. Low-income households in tariff category 900 W also receive subsidized electricity.	households (*rumah tangga*)
3	**Poverty**	Social assistance	Refers to households that receive government subsidized housing (MBR). Used as a proxy measure for poverty. Governments are required to facilitate the construction and acquisition of houses through a gradual and sustainable housing development planning program.	households (*rumah tangga*)
4	**Livelihoods**	Type	Refers to main livelihood of the head of household. Trade and services may be a proxy measure for informal traders and vendors.	households (*rumah tangga*)
5	**Health**	Access	Refers to main type of healthcare facility used by the household.	households (*rumah tangga*)
6	**Education**	Access	Refers to proximity of education facility for households with school-aged children. Figures do not include households without school-aged children.	households (*rumah tangga*)

Source: Local Regulation (Perda) No. 9/2017.

Table 3.2 Non-Physical Characteristics of Slum Communities

No	Criteria	Indicator	Description	Unit
1	**Building**	Irregularity	Refers to residential buildings that do not meet: 1) regulations in the zoning code (RDTR) and urban design guidelines (RTBL) including shape, size, location, and placement of the building on a lot; and 2) regulations for building layout in RTBL, including block, lot, height, floors, site orientation, and frontage	households *(rumah tangga)*
		Density	Refers to residential buildings that: 1) exceed Building Coverage Ratio (KDB) stipulated in RDTR and/or RTBL; 2) exceed Floor Area Ratio (KLB) stipulated in RDTR and/or RTBL	Hectares
		Quality	Refers to residential buildings that do not meet: 1) building layout requirements, such as location designation and building density; and 2) building structural requirements, such as fire, life safety, and comfort	households *(rumah tangga)*
2	**Roads**	Access	Refers to neighborhood road network that does not connect between or within residential areas	Meters
		Quality	Refers to existing neighborhood roads where all or part of the road has visible damage, including cracks and changes in shape	Meters
3	**Water Supply**	Access	Refers to families that cannot access safe drinking water that meets quality requirements in accordance with laws and regulations	families (KK, *kepala keluarga)*
		Adequacy	Refers to families that have less than the minimum daily requirement for water needs of 60 (sixty) liters / person / day	families (KK, *kepala keluarga)*
4	**Drainage**	Access	Refers to tertiary drainage channels and/or local channels that are not available, and/or are not connected to other channels (primary, secondary)	Meters
		Inundation	Refers to neighborhood drainage network that is unable to accommodate runoff, causing innundation with a height of more than 30 cm for more than 2 (two) hours, with incidence of more than twice a year	Hectares
		Quality	Refers to neighborhood drainage system with open drains or visible damage	Meters
5	**Sanitation**	Access	Refers to families that do not have access to private or shared latrines or toilets	families (KK, *kepala keluarga*)
		Quality	Refers to latrines or toilets that are not connected to either a septic tank or sewage treatment system	families (KK, *kepala keluarga)*
6	**Solid Waste Management**	Access	Refers to families that lack access to garbage collection points for domestic waste	families (KK, *kepala keluarga)*
		Quality	Refers to families that do not follow solid waste management standards, such as: 1) domestic sorting; 2) neighborhood waste collection; 3) neighborhood waste transportation; and 4) neighborhood waste processing	families (KK, *kepala keluarga)*
7	**Fire Protection**	Access	Refers to residential buildings that lack fire protection infrastructure, such as: 1) water supply; 2) neighborhood roads that allow access to fire fighting vehicles; 3) communication system for fire notification; 4) easily accessible data on environmental fire protection systems	households *(rumah tangga)*
		Means	Refers to residential buildings that lack fire protection facilities, such as: 1) fire extinguisher; 2) fire fighting vehicles	households *(rumah tangga)*

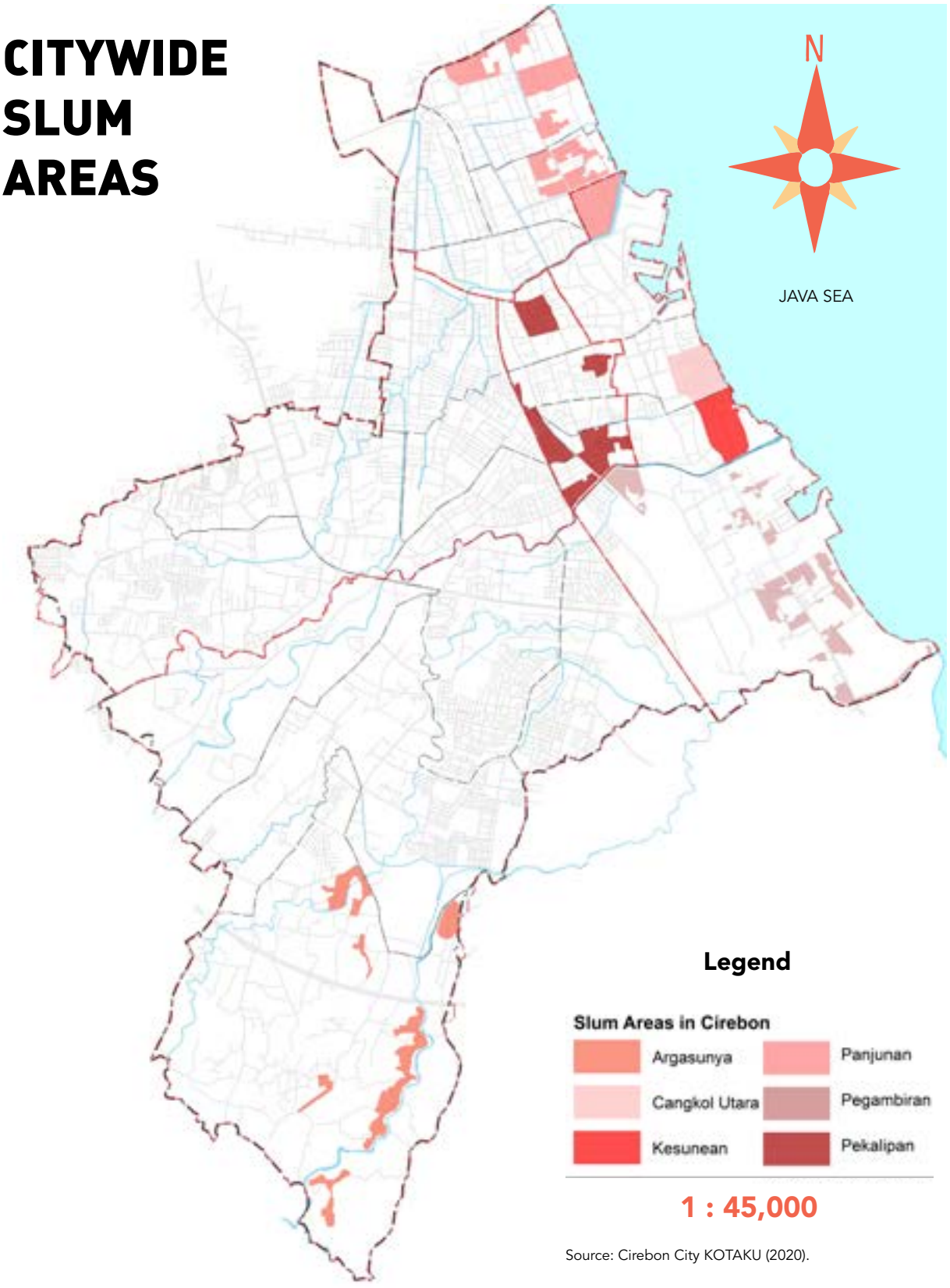
Source: Local Regulation (Perda) No. 9/2017.

Table 3.3 Physical Conditions of Slum Communities

3.2 SLUM PROFILES

To visualize the existing conditions and characteristics of slum communities more effectively, the following profiles simplify the 2020 KOTAKU dataset into infographics for each slum area designated by the current SK Kumuh. The infographics cover all 16 slum indicators across the seven infrastructure criteria (Table 3.3). Additionally, the infographics also illustrate non-physical characteristics of each slum area to present a more comprehensive snapshot of each community (Table 3.2).

CITYWIDE SLUM AREAS



Source: Cirebon City KOTAKU (2020).

Source: Cirebon City KOTAKU (2020).

Fishing boats docked along a jetty in Kelurahan Panjunan. Asian Development Bank.

KAWASAN PANJUNAN

Source: Cirebon City KOTAKU (2020).

Slum area (Ha)	:	57.78
Total population (Individual)	:	15,657
Number of households (RT)	:	3,819
Number of families (KK)	:	4,501
Number of poor households (RT)	:	2,959

Source: Cirebon City KOTAKU (2020).

A neighborhood mural painted as part of mangrove forest tourism development in Kelurahan Kasepuhan. Asian Development Bank.

KAWASAN KESUNEAN

Source: Cirebon City KOTAKU (2020).

Slum area (Ha)	:	18.83
Total population (Individual)	:	6,972
Number of households (RT)	:	1,683
Number of families (KK)	:	2,027
Number of poor households (RT)	:	1,085

Source: Cirebon City KOTAKU (2020).

Public space in Kelurahan Kasepuhan. Asian Development Bank.

KAWASAN CANGKOL UTARA

Source: Cirebon City KOTAKU (2020).

Slum area (Ha)	:	15.10
Total population (Individual)	:	6,985
Number of households (RT)	:	1,409
Number of families (KK)	:	1,753
Number of poor households (RT)	:	1,133

Source: Cirebon City KOTAKU (2020).

Agricultural area in Kelurahan Pegambiran. Asian Development Bank.

KAWASAN PEGAMBIRAN

Slum area (Ha)	:	23.51
Total population (Individual)	:	9,560
Number of households (RT)	:	2,731
Number of families (KK)	:	3,068
Number of poor households (RT)	:	1,710

Source: Cirebon City KOTAKU (2020).

Source: Cirebon City KOTAKU (2020).

A neighborhood road in Kelurahan Pekalipan. Asian Development Bank.

KAWASAN PEKALIPAN

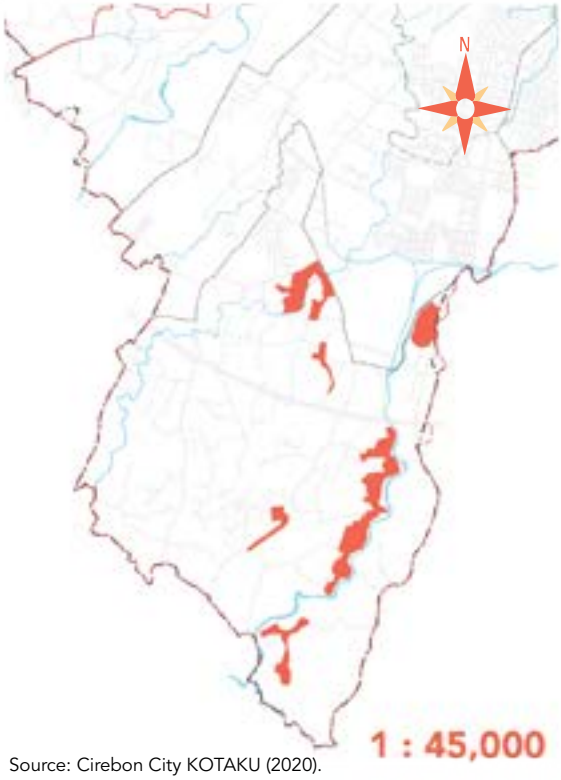
Source: Cirebon City KOTAKU (2020).

Slum area (Ha)	:	39.86
Total population (Individual)	:	13,959
Number of households (RT)	:	3,648
Number of families (KK)	:	4,761
Number of poor households (RT)	:	2,241

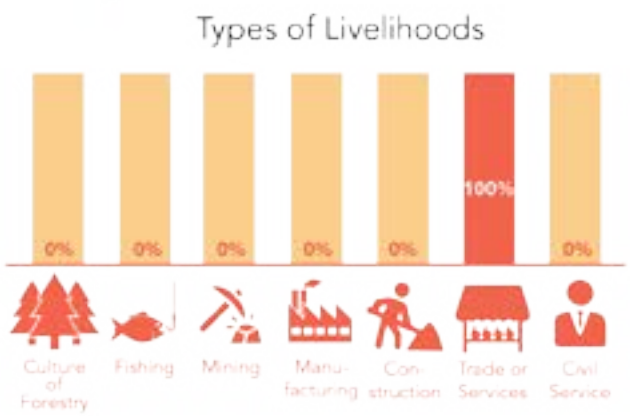
Source: Cirebon City KOTAKU (2020).

A footbridge in Kelurahan Argasunya helps residents cross the river. Asian Development Bank.

KAWASAN ARGASUNYA



Slum area (Ha)	:	29.87
Total population (Individual)	:	9,655
Number of households (RT)	:	2,733
Number of families (KK)	:	2,773
Number of poor households (RT)	:	766



Source: Cirebon City KOTAKU (2020).

Source: Cirebon City KOTAKU (2020).

3.4 SLUM DEVELOPMENT TRENDS

SLUM ALLEVIATION AND PREVENTION

Slum development figures thus far suggest positive outcomes from city government programs. At a city-level, KOTAKU program data from 2020 show that Cirebon's slum areas have decreased by 46% since 2017.[7] With investment support from central and provincial governments and private enterprises, slums areas have decreased from 316 ha in 2017 to 185 ha in 2020 (Figure 3.1).[8]

However, KOTAKU has also identified potential new slums totaling 265 ha across three *kecamatan*. Kecamatan Harjamukti has the most area vulnerable to becoming slums, at 71% of the total area, followed by Kecamatan Kesambi at 19% and Kecamatan Kejaksan at 10% (Appendix 1).[9] Thus, while Cirebon's KOTAKU program monitoring is showing signs of success at reducing slums, more longitudinal data will be needed to evaluate program impacts.

Provincial and national figures also suggest ambiguous results. In West Java, households in the bottom 40% who were living in urban slums decreased from 14.1% to 11.8% between 2015 and 2018.[10] However, households in the bottom 40% who were living in urban slums had increased to nearly 20% by 2019. These figures suggest that city governments may still have limited capacity to prevent the resurgence of slums.

LAND RECLAMATION

In Cirebon, coastal slum residents in Kelurahan Lemahwungkuk have been reclaiming land by using layers of solid waste to build on the river delta's natural sedimentation. DLH estimates that approximately 70% of the 7 km coastline has been reclaimed using solid waste.[11] Residents either sell these plots of new land for profit or construct homes on them. In 2017, 353 housing units had been built on reclaimed land in Kelurahan Lemahwungkuk.[12] Research on Cirebon's land reclamation patterns suggests that its drivers are a combination of increased demand for land and limited access to land through formal processes.[13]

These land reclamation activities have introduced new administrative questions for city government. First, it has unofficially altered Cirebon's administrative boundaries, resulting in policy ambiguity. Although official regulation sets the city administrative area at 3,735 ha,[14] satellite imagery found an additional 79 ha along the coast, increasing total area to 3,810 ha (Figure 3.2).[15] This discrepancy has resulted in areas of the city that are unrecognized in formal spatial planning policies and documentation.

Secondly, land reclamation activities have resulted in uncoordinated policy responses among city agencies. Although undocumented in spatial planning policies, the reclaimed land has been recognized by the Cirebon City Land Administration Office (Kantah BPN), which has issued land titles for reclaimed land.[16] Individuals hold land titles through the central government's land registration program, Comprehensive Systematic Land Registration (PTSL). Furthermore, although the city government has provided basic infrastructure services such as drainage, neighborhood roads, and water supply to these reclaimed areas, in 2010 the city government then constructed gabion walls *(bronjong)* along the coast to prevent further expansion.[17] These ambiguous policy responses to land reclamation activities have likely contributed to slum development in this area.

7. Ibid. Fishermen later deconstructed the gabion walls to make fish aggregating devices (*rumpon*).
8. Calculations based on 2020 KOTAKU data.
9. Government of Cirebon City. 2020. *Neigborhood Development Plan* (RPLP). Cirebon City.
10. Statistics Indonesia (BPS). *BPS Database*: Poverty (accessed 19 August 2020).
11. Interviews with city agencies. 26-28 February 2020.
12. Interview with residents in Kelurahan Lemahwungkuk. 26-28 February 2020.
13. Noorrahmah et al. 2014. *Opportunities and Challenges of Land Reclamation in Cirebon City (Tanah Timbul di Kota Cirebon Peluang dan Tantangan).* Bandung
14. Government of Cirebon City. Local Regulation (*Perda*) No.7/1986 on the City Master Plan.
15. Noorrahmah et al. 2014. *Opportunities and Challenges of Land Reclamation in Cirebon City (Tanah Timbul di Kota Cirebon Peluang dan Tantangan).* Bandung
16. Interview with residents in Kelurahan Lemahwungkuk. 26-28 February 2020.
17. Ibid. Fishermen later deconstructed the gabion walls to make fish aggregating devices (*rumpon*).

Source: Mayoral Decree (SK) No.663/Kep.133-DPRKP/2018.

Figure 3.1 Slum area in Cirebon City between 2015 and 2020

Citra 1994 **Citra 2014** **Hasil overlay**

Source: Noorrahmah et al. (2014).

Figure 3.2 Coastal land reclamation between 1994 and 2014

3.5 INSTITUTIONAL ARRANGEMENTS

POLICY AND PLANNING FRAMEWORK

Several national and subnational policies govern slum upgrading activities in Cirebon.

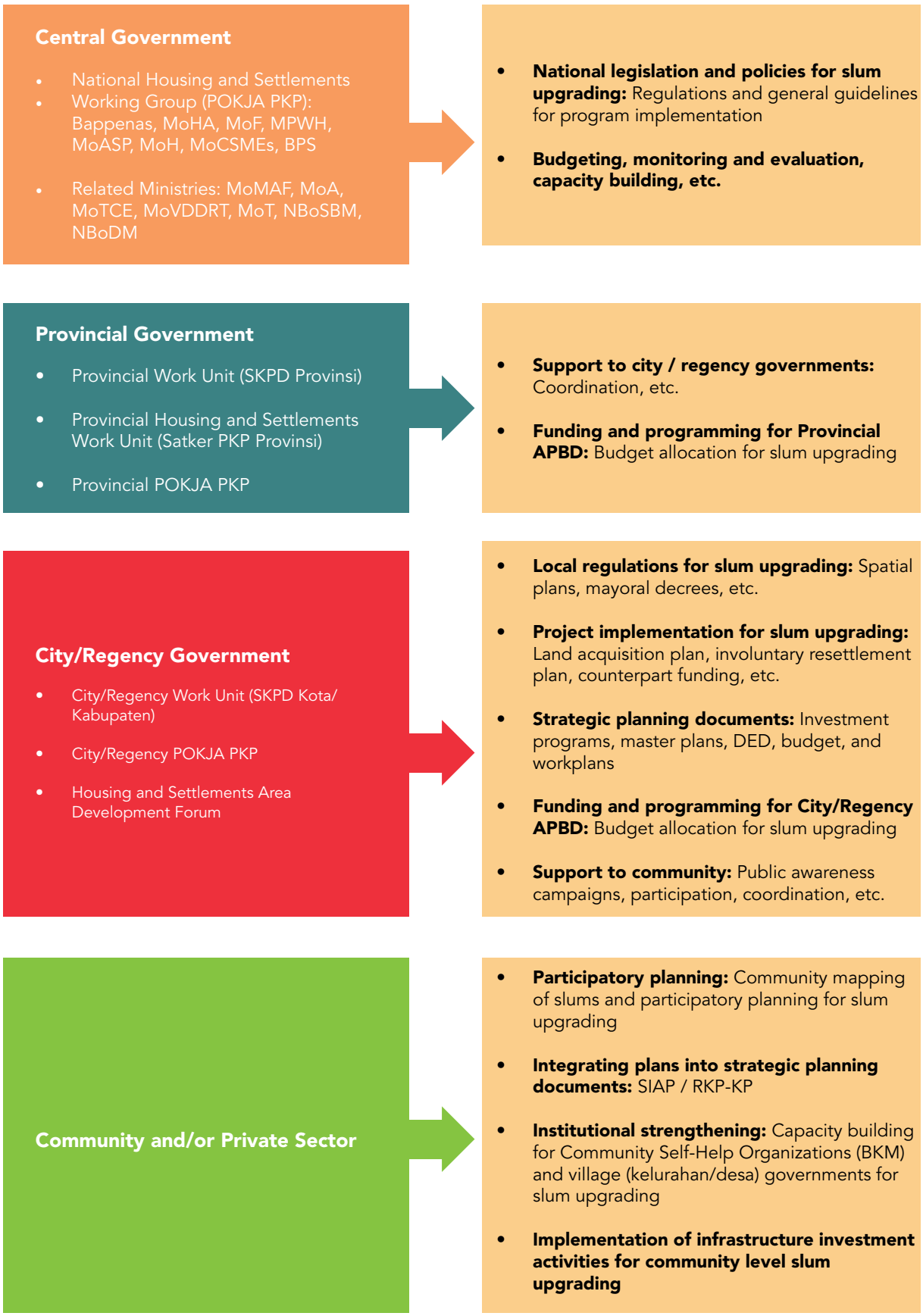
- For the RPJMN 2020-2024 (detailed in Chapter 2), the GOI's target is to alleviate 10,000 ha of slum area, primarily through provision of water supply, sanitation, and affordable housing.
- The MPWH Strategic Plan (Renstra PUPR) is a national policy document that guides planning, programming, implementation, and monitoring and evaluation of infrastructure development over a five-year period. For the period 2020-2024, MPWH has included the 10,000 ha of slum upgrading as an indicator for its strategic priority (SS-3) to increase provision of access to housing along with adequate, safe, and affordable housing infrastructure.[18] The Renstra PUPR references the RPJMN.
- The Mayoral Decree on Slums (SK Kumuh) is a city policy document whereby city government designates specific areas of the city as slums. Cirebon's most current SK Kumuh is the second amendment from 2018 which designates six areas as slums across four *kecamatan* and 11 *kelurahan*, totaling 315.91 ha. The decree further designates the Slum Prevention and Quality Improvement Plan (RP2KPKP) and Program Memorandum as the main policy documents for slum upgrading in Cirebon. As of this writing however, the city is currently still referencing the slum areas designated in the 2015 Mayoral Decree on Slums because the central government is still reviewing the 2018 amendment.
- RP2KPKP is a city planning document meant to guide slum upgrading activities. It puts forth a comprehensive, integrated scope in the context of both the city and region, and identifies physical and non-physical activities (e.g., capacity building, community empowerment, and socioeconomic development) for slum alleviation and prevention. RP2KPKP references the city's RTRW (detailed in Chapter 2).
- The Program Memorandum is a city planning document that provides an action plan for slum upgrading. Its purpose is to synchronize information between the RP2KPKP and RKPKP, Cirebon's first slum upgrading plan. Key guidance from this document include: prioritization of the coastal slum areas; planning at a regional scale; and stakeholder collaboration.
- The Housing and Settlements Development Plan (RP3KP) is a multi-level planning document meant to guide housing activities. The city-level RP3KP is meant to reference its respective provincial-level RP3KP. Currently, city government has not yet prepared this document as the West Java RP3KP is still in progress.
- The Neigborhood Development Plan (RPLP) is a series of *kelurahan*-level planning documents for each *kelurahan* that has a slum area. The RPLP analyzes basic infrastructure services in each *kelurahan* to assess needs; presents sustainable development scenarios for economic development, socio-cultural development, and disaster risk management; and presents a roadmap for investments.

ROLES AND RELATIONSHIPS OF INSTITUTIONS

In addition to the standard division of tasks across national and subnational stakeholders (Figure 3.3), in 2017 the city government formed an interagency Housing and Settlements Area Working Group (POKJA) to coordinate, lead, and control all stages of housing and settlements development, from planning to post-construction of housing and basic services.[19] The POKJA is headed by:

- Chairman: sitting director of the Department of Housing and Settlements (PERKIM)
- Vice Chairman: sitting director of the

18. Government of Indonesia. 2020. Ministerial Regulation of Public Works and Housing *(Permen)* No. 23/2020 on Strategic Plan *(Renstra)* 2020-2024. Jakarta.
19. Government of Cirebon City. 2017. Mayoral Decree (SK) No. 663/2017 on Working Group of Housing and Settlements Area in Cirebon City.



Source: MPWH (2016).

Figure 3.3 Division of roles in slum upgrading

Regional Development Planning, Research and Development Agency (BP4D); and

- Secretary: sitting director of the Water Resources Division of the Public Works and Spatial Planning Agency (DPUPR).

The POKJA is further divided into four task forces: 1) planning and financing; 2) advocacy and partnership; 3) technical and community empowerment; and 4) data collection and evaluation (Appendix 2).

EXISTING EFFORTS

Cirebon's past and current slum alleviation programs are as follows.

- UPP (Urban Poverty Program, 2000-2007). Funded by World Bank (WB), UPP aimed to accelerate poverty reduction through strengthening community institutions, community empowerment, and other local development actors.[20]
- National Program for Community Empowerment (PNPM, 2007-2014). PNPM aimed to improve the welfare and employment opportunities of the poor through capacity building such as solving various problems related to quality of life, independence, and welfare.[21]
- Cities without Slums Program (KOTAKU, 2016-Present). Specifically, the World Bank financed National Slum Upgrading Project (NSUP) has been supporting the city with slum alleviation and community empowerment through revitalization of the Community Self-Help Organization (BKM).[22] NSUP has implemented infrastructure upgrades such as water supply, paved neighborhood roads, and drainage.
- A program funded by the Government of West Java to improve slums in Kelurahan Panjunan. Detailed engineering design was finalized in 2018 and addresses the seven infrastructure criteria for slums.[23]
- The city government has also provided slum areas with public latrines and showers through the *Mandi Cuci Kakus* (MCK) program. Cirebon has also participated in the national Climate Village *(Kampung Iklim)* Program which awards neighborhoods for successful initiatives in greening and managing solid waste. Residents of Kelurahan Kasepuhan, particularly youth, have also completed a community-led beautification project to create a "rainbow village" by painting neighborhood paths with bright colors.

DEVELOPMENT PLANS

The Government of Cirebon City has detailed development plans related to slums. With assistance from KOTAKU, the local government has issued RPLP for each of the 11 *kelurahan* with a designated slum area. Key plans from these documents include: [24]

- Revitalization and Restoration. By 2024, the city plans to upgrade basic infrastructure in slum areas across all seven infrastructure criteria, including: 1) water supply, through provision of public taps, and house connections (SR); 2) sanitation, through construction of IPAL and private latrines; 3) solid waste management, through provision of trash cans, waste collection vehicles, and temporary garbage collection points; 4) drainage; 5) roads; 6) fire protection, through provision of hydrants; and 7) housing, through rehabilitation. Investments also include planned development of public green open space. These plans target all 11 relevant *kelurahan.*
- Resettlement. Four *kelurahan* also have resettlement plans, including Kelurahan Pekalangan, Kelurahan Pekalipan, Kelurahan Pulasaren, and Kelurahan Lemahwungkuk.
- Supervision and Control. For slum prevention, the city plans to conduct monitoring, evaluation, and reporting in areas identified as potential slums in all 11 relevant *kelurahan*.
- Community Empowerment. The city plans to facilitate community empowerment through several initiatives:

20. Ministry of Finance (MoF). 2007. *Monitoring and Evaluation Report on Loans and Grants*. Jakarta.
21. Government of Indonesia. 2012. *PNPM Mandiri of 2012-2013*. Jakarta.
22. Ministry of Public Works and Housing (MPWH). 2017. *Overview of Cities without Slums* (KOTAKU) *Program*. Jakarta
23. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City*. Manila.
24. Government of Cirebon City. 2020. *Neighborhood Development Plan (RPLP)*. Cirebon City.

1) creative economy support, including business development with capital assistance; 2) life skills training; 3) promotion of local products through marketing infrastructure; 4) community education through award of scholarships; and 5) public health awareness through education campaigns on waste management and Clean and Healthy Living (PHBS). These plans target all 11 relevant *kelurahan*.

PANJUNAN ESTUARY REDEVELOPMENT. The city government has plans to redevelop the slum area of Kawasan Panjunan into a tourist destination by providing neighborhood improvements including three new public housing blocks (RUSUNAWA), green open space, pedestrian-friendly street improvements, communal septic tanks, solid waste management facility, and drainage. Currently, 105 families live on the 40-ha project site although only some 95 hold land titles. Although the project will resettle slum residents living on state-owned land along the Sukalila River,[25] the city government has budgeted compensation for affected residents even though legally unrequired to do so. Compensation will first be determined by an appraisal team, with city government seeking additional budget allocation if needed. The city government will then seek financing for livelihood facilities for affected residents. Lastly, affected residents who meet certain criteria will be relocated to the new RUSUNAWA. In attempts to reduce negative impacts of the project on residents, the deputy mayor has also conducted community outreach. Construction of the RUSUNAWA is planned for 2021 although the city government has not yet secured land or financing.[26]

25. According to a memorandum from Cimanuk-Cisanggarung River Basin Center (BBWS).
26. Radar Cirebon. 2020. "City Government Targets Free Area along the Panjunan Coast" (accessed 23 March 2021).

A canal in Kelurahan Larangan. Asian Development Bank.

CHAPTER 4

BUILT CAPITAL: URBAN INFRASTRUCTURE AND SERVICES

Built capital comprises the seven areas of basic physical infrastructure that the GOI uses to formally define slum areas: water supply, sanitation, solid waste management, drainage, roads, fire-protection, and housing. To provide a more comprehensive city-level assessment, the report also includes other major areas of infrastructure such as transportation, public space, and digital connectivity.

4.1 WATER SUPPLY

POLICY AND PLANNING FRAMEWORK

The Government of Indonesia considers drinking water as a basic service, and all city governments are responsible for provision of drinking water services. For the period 2020-2024, GOI's policy is access to safe drinking water for 100% of households, of which 30% is piped.[1] Aligned with the RPJMN, MPWH's strategy for provision of safe drinking water is to improve settlement infrastructure services using a "smart living" approach.[2]

National water regulations recognize two types of drinking water supply systems for safe access: 1) pipeline systems; and 2) non-pipeline systems. In Cirebon City, state-owned enterprise Local Water Corporation (PERUMDAM) Tirta Giri Nata is responsible for pipeline systems whereas the Department of Public Works and Spatial Planning (DPUPR) and NGOs facilitate provision of non-pipeline systems.[3]

INSTITUTIONAL ARRANGEMENTS

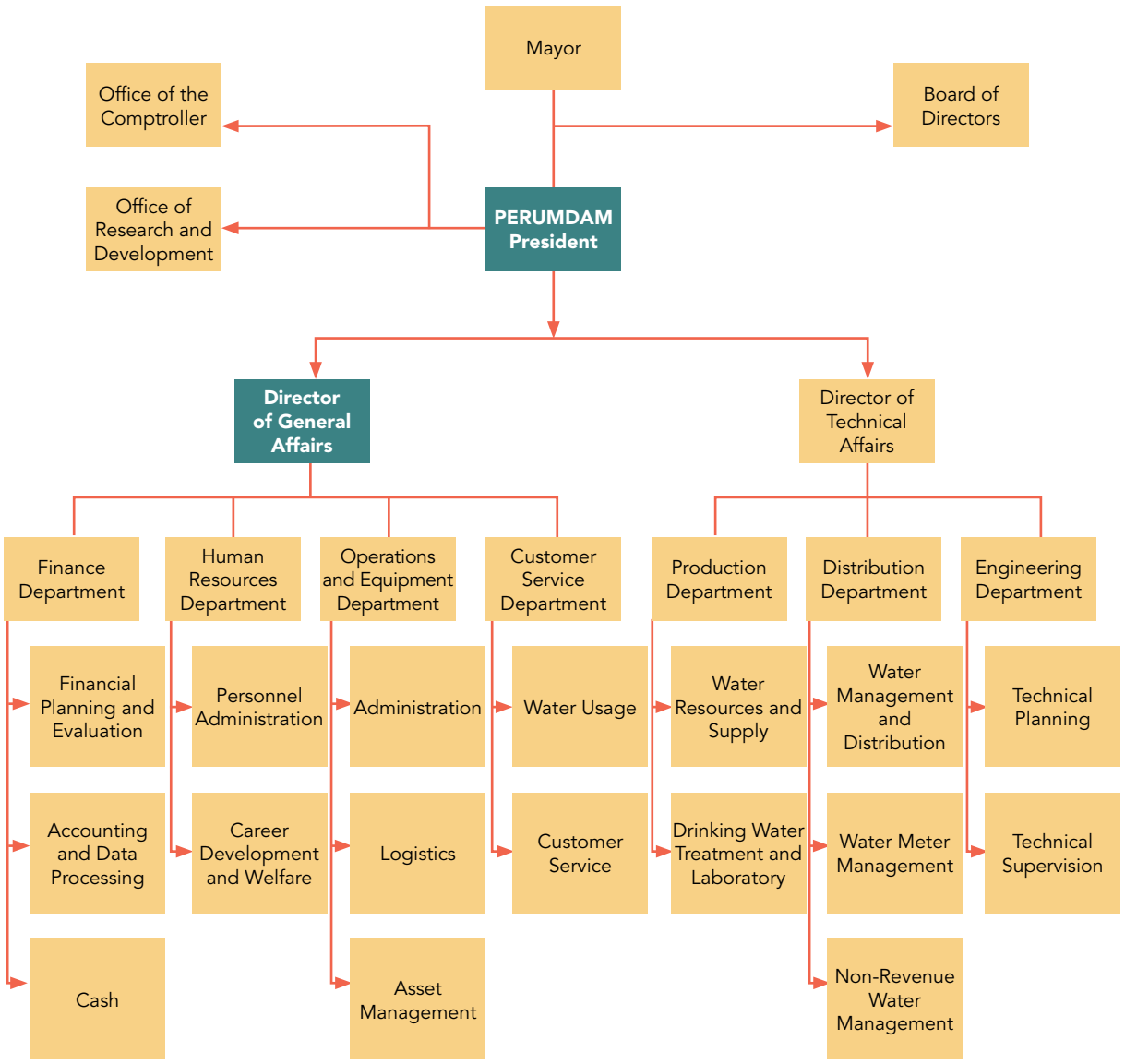
PERUMDAM Tirta Giri Nata services two administrative areas: Cirebon City Service Area and Cirebon Regency Service Area. Cirebon City Service Area covers the city's five subdistricts *(kecamatan)* and 22 urban villages *(kelurahan)*, while the Cirebon Regency Service Area covers five subdistricts *(kecamatan)* surrounding the city. In 2015, PERUMDAM had 48,920 customers and serviced approximately 63% of the total population. Its largest customer based was in Kecamatan Kesambi (12,566 customers), and its smallest customer based was in Kecamatan Pekalipan (5,885 customers).[4]

PIPELINE SYSTEM. PERUMDAM Tirta Giri Nata is led by a president and two directors, one responsible for general affairs and the other for technical issues (Figure 4.1).[5]

NON-PIPELINE SYSTEM. The head of the local *rukun warga* is the person-in-charge of all deep well operations within his/her jurisdiction (Figure 4.2). S/he is supported by a treasurer, secretary, and technical team responsible for operations and maintenance of the system.

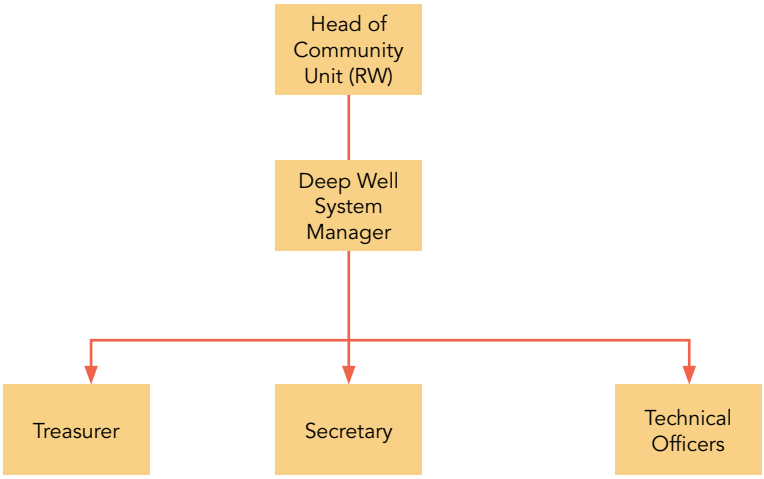
RAW WATER. Department of Public Works and Spatial Planning (DPUPR) is responsible for raw water in Cirebon (Figure 4.3).

1. Government of Indonesia. 2020. Presidential Regulation *(Perpres)* No. 18/2020 on National Medium-Term Development Plan (RPJMN) 2020-2024. Jakarta. Listed as Major Project No. 33.
2. Government of Indonesia. 2020. Ministerial Regulation of Public Works and Housing *(Permen)* No. 23/2020 on Strategic Plan *(Renstra)* 2020-2024. Jakarta. Outlined in Strategic Priorities *(Sasaran Strategis)* SS-3. "Smart Living" principles include: 1) livable settlements; 2) green buildings; 3) disaster-resilient settlements; and 4) green technologies.
3. Government of Cirebon City. 2012. Mayoral Regulation *(Perwal)* No. 7/2012 on Organization and Work Procedures of the Public Works, Housing, Energy, and Mineral Resources Department of Cirebon City.
4. PERUMDAM Tirta Giri Nata of Cirebon City. 2016. *Corporate Plan of PERUMDAM Kota Cirebon for 2017-2021*. Cirebon City."
5. Government of Cirebon City. 2017. Mayoral Regulation (Perwal) No. 51/2017 on Organization and Work Procedures of the Tirta Giri Nata Local Water Corporation.



Source: Mayoral Regulation (Perwal) No. 51/2017.

Figure 4.1 Organizational chart for pipeline system management by PERUMDAM Tirta Giri Nata



Source: Cirebon City BP4D (2014).

Figure 4.2 Organizational chart of non-pipeline system management

EXISTING SERVICE DELIVERY

PERUMDAM supplies 89% of clean drinking water through a pipeline system, with the remaining 11% provided through a non-pipeline system at the *rukun warga*-scale supported by city government.[6] In 2015, PERUMDAM's service area included 84% of city population. As Cirebon City does not have its own water source, PERUMDAM pumps water from Paniss Spring *(Cipanis)* in nearby Kuningan Regency and compensates the district accordingly.

CITYWIDE. Though in theory the gravitational system operates on a 24-hour basis, in reality, some areas in the distribution network do not receive a continuous supply of water. Water demand exceeds raw water supply, especially during peak hours,[7] and only half of PERUMDAM customers had adequate water pressure in 2017.[8] Although PERUMDAM has seen an increase in the number of customer connections in the last five years, the ratio of water consumption per customer connection shows a decline as additional water production has stagnated due to limited raw water.

As the quality of the raw water is high, PERUMDAM's water treatment process is relatively simple, comprising aeration, sedimentation, and chlorination.[9] However, between 2015 and 2017, PERUMDAM's water quality declined from approximately 99% to 95% compliant.[10] PERUMDAM attributes this decline to the household practice of mixing piped drinking water with water from lower quality non-pipeline sources.[11]

As of 2019, Kelurahan Argasurya was categorized as water-scarce. Because of its location in the highlands, PERUMDAM has difficulty distributing piped water to this location due to inadequate water pressure, which makes water distribution to the highlands unprofitable.[12] The city government has instead constructed 11 deep wells to meet water needs: eight units in Kelurahan Argasunya; two units in Kelurahan Kalijaga; and one unit in Kelurahan Sunyaragi.

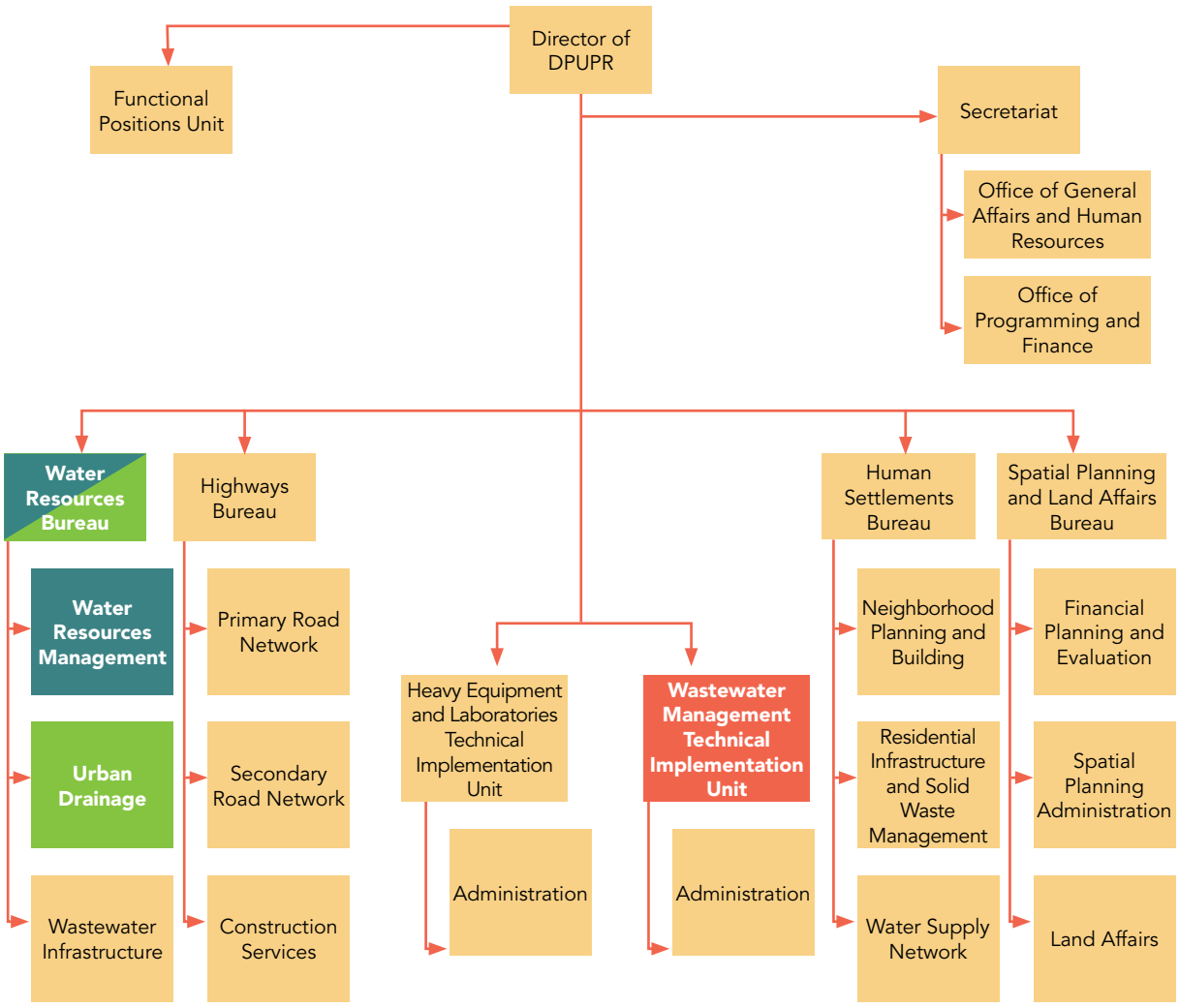
SLUMS. At least 94% of families in all slum areas have access to safe drinking water except for those in Kawasan Panjunan, where only two in three families have access. However, between 22% and 50% of families in all slum areas cannot meet daily water needs, with the highest need in Kawasan Panjunan and Pegambiran.[13] These figures suggest that while slum communities largely have access to safe drinking water, they may still experience water insecurity.

DEVELOPMENT PLANS

PERUMDAM's main challenge is insufficient water pressure, which causes the pipeline system and existing reservoirs to operate under capacity. Because the water supply system relies primarily on gravity, even with the help of existing pumps, the water pressure is still too low to service coastal areas for 24 hours. Additionally, as groundwater quality in coastal areas is either saline or brackish, groundwater is not a feasible alternative for piped drinking water.[14] PERUMDAM's development plans are divided into four stages.

1. Phase I (2015–2016), an urgent program with the goal to optimize the existing system with the Cipaniis Spring, reduce leakage, increase distribution reservoirs, and add customer connections;
2. Phase II (2017–2019), a short-term program to optimize the existing system with the Cipaniis Spring, add new raw water sources, reduce leakage, increase distribution reservoirs, and add customer connections;
3. Phase III (2020–2024), a medium-term program with to optimize the existing system with the Cipaniis Spring, source raw water from the Jatigede Reservoir, reduce leakage, increase distribution reservoirs, and add customer connections; and
4. Phase IV (2025–2034), a long-term program with the same targets as Phase III.

6. Interviews with BP4D. 26-28 February 2020.
7. PERUMDAM Tirta Giri Nata of Cirebon City. 2016. *Corporate Plan of PERUMDAM Kota Cirebon for 2017-2021*. Cirebon City.
8. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.
9. Ibid
10. PERUMDAM tests drinking water quality according to requirements from the Ministerial Decree of Health (SK) No. 492/2010 on Requirements for Drinking Water Quality.
11. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.
12. Cirebon City Regional Development Planning, Research, and Development Agency (BP4D). 2010. City Sanitation Strategy *(Buku Putih Sanitasi).* Cirebon City.
13. Calculations based on 2020 KOTAKU data.
14. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.



Source: Mayoral Regulation *(Perwal)* No. 48/2016.

Figure 4.3 Organizational chart for management of raw water; sanitation and wastewater; and stormwater and drainage by DPUPR[23]

System	Number of Connections	Length of network (km)	Number of pumping stations	Plant capacity (m^3/d)	Percentage (%) of capacity in use
Ade Irma	1,800	20.6	1	2,500	43
Kesenden	174	11.5	1	3,000	3
Perumnas Utara	1,384	9.2	2	1,000	83
Perumnas Selatan	3,557	27.7	2	2,000	107
TOTAL	6,915	69.0	6	8,500	49

Source: Cirebon City BP4D (2015).

Table 4.1 Summary of off-site sanitation system

Priority areas for development are Kelurahan Lemahwungkuk and Kasepuhan. PERUMDAM anticipates that if both reservoirs within Cirebon can be maximized, it will be able to meet water supply demand. In this scenario, PERUMDAM would still use the two reservoirs located in Cirebon Regency as well as the two in the city.[15] PERUMDAM also plans to upgrade older parts of the pipeline system.

4.3 SANITATION AND WASTEWATER

POLICY AND PLANNING FRAMEWORK

For the period 2020-2024, the Government of Indonesia's sanitation policies include access to sanitation for 90% of households, with safe domestic wastewater management for 15% of households.[16] The GOI further aims to serve 3 million households through house connections to off-site citywide wastewater management systems (SPALD-T); serve 6.5 million households through fecal sludge treatment plants (IPLT); and achieve 0% of households practicing open defecation. Aligned with the RPJMN, MPWH's strategy for provision of sanitation is to improve settlement infrastructure services using a "smart living" approach.[17]

In Cirebon City, existing regulations on wastewater management mostly relate to management responsibility and service fees.[18] The city government does have a Wastewater Master Plan for the period 2015-2019.

INSTITUTIONAL ARRANGEMENTS

By central government decree,[19] PERUMDAM began to transition wastewater treatment services over to DPUPR in 2017, training DPUPR in wastewater services until 2019, when the agency fully took over responsibility.[20] Within DPUPR, domestic wastewater management in Cirebon City is now the responsibility of the technical implementation unit (UPTD) of Wastewater Management (Figure 4.3).[21] The 14 staff in the UPTD are tasked with the operation of sewerage and treatment facilities.[22]

EXISTING SERVICE DELIVERY

CITYWIDE. The domestic wastewater management system in Cirebon City is divided into on-site and off-site systems. The on-site system includes 64 public toilets and one fecal sludge treatment plant (IPLT). However, the existing IPLT is not functioning, so septage is instead conveyed to the wastewater treatment plants (IPAL).[24] Cirebon's off-site system includes four IPAL that serviced approximately 7,400 domestic connections and 37,000 people as of 2017 (Table 4.1),[25] or 8% of the city population. As of 2014, 6% of families still practiced open defecation.[26]

SLUMS. Across all slum areas, between 85% to 99% of families have access to a private or shared latrine or toilet. However, up to 30% of families in slum areas use latrines and toilets that are not connected to a septic tank or IPAL, with those in Kawasan Panjunan, Kesunean, and Pekalipan most frequently unconnected.[27] No data are available regarding desludging rates, though in 2017, CDIA found that slum residents in Kawasan Cangkol Utara do not use desludging services.28 The available figures suggest that slum residents may not yet have access to safe sanitation.

DEVELOPMENT PLANS

By 2020, DPUPR had set a target for 38% of domestic wastewater service coverage through the pipeline network,[29] but recent data is not publicly

15. Interviews with PERUMDAM. 26-28 February 2020.
16. Government of Indonesia. 2020. Presidential Regulation *(Perpres)* No. 18/2020 on National Medium-Term Development Plan (RPJMN) 2020-2024. Jakarta. Listed as Major Project No. 32.
17. See footnote 2, this chapter.
18. Government of Cirebon City. 2019. Local Regulation *(Perda)* No. 10/2019 on Domestic Waste Water Management; Government of Cirebon City. 2018. Mayoral Regulation *(Perwal)* No. 3/2018 on Action of Access to Sanitation in Cirebon City; Government of Cirebon City. 2012. Mayoral Regulation *(Perwal)* No. 39/2012 on Permission for Wastewater Disposal to Water or Water Sources.
19. Government of Indonesia. 2018. Ministerial Regulation of Public Works and Housing *(Permen)* No. 14/2018 on Implementation of Domestic Wastewater Management System.
20. Interviews with PERUMDAM. 26-28 February 2020.
21. Government of Cirebon City. 2018. Mayoral Regulation *(Perwal)* No. 14/2018 on Formation, Position, Roles and Functions, Organizational Structures and Work Procedures of Technical Implementing Units at Departments in Cirebon City.
22. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.
23. Government of Cirebon City. 2018. Mayoral Regulation (*Perwal*) No. 48/2016 on Position, Roles, Functions, Organizational Structures and Work Procedures of the Public Works and Spatial Planning Department of Cirebon City.
24. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.
25. Ibid.
26. Government of Cirebon City. 2015. *Wastewater Master Plan (SSK).* Cirebon City.
27. Calculations based on 2020 KOTAKU data.
28. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.
29. Ibid.

available to confirm their progress. The agency also plans to upgrade the four IPAL and partner with private desludging enterprises to meet minimum service standards.[30]

4.4 STORMWATER DRAINAGE AND FLOODING

POLICY AND PLANNING FRAMEWORK

Cirebon City's local regulations on urban drainage relate to implementation, financing, the role of the community and the private sector, as well as guidance and supervision.[31] Cirebon also has a Drainage Master Plan last updated in 2011.[32]

INSTITUTIONAL ARRANGEMENTS

The Water Resources Division of DPUPR is responsible for drainage management in Cirebon City (Figure 4.3). Specifically, the Urban Drainage Division leads policy and planning for development of drainage systems directly connected to rivers, though river basin management itself is under jurisdictional authority of the Cimanuk-Cisanggarung Greater Basin Territory Center (BBWS) (detailed in Chapter 6). The division is also responsible for coordination and implementation of public service delivery.[33]

EXISTING SERVICE DELIVERY

CITYWIDE. The city's stormwater management system relies on existing tributaries and sub-tributaries as primary and secondary drainage channels, which flow gravitationally toward the Java Sea, combining stormwater and wastewater. The stormwater management system does not include pump stations or retention basins to control the flow of large volumes of river water downstream into the city.[34]

The shape of Cirebon City's drainage basin is tapered and resembles a leaf, indicating relatively low discharge in response to precipitation.[35] The basin has four main river systems that drain to the Java Sea: Kedung Pane River, Sukalila River, Kesunean (Kriyan) River, and Kalijaga River. These rivers constitute the city's primary drainage system and are classified as Class IV, used for agriculture, irrigation, and fisheries.[36] Except for the Sukalila River, the upstream areas of the rivers are outside the administrative boundary of the city. Management of upstream areas thus relies on policies of other regional authorities despite downstream effects of upstream conditions.

Despite a drainage basin shape that suggests low discharge, Cirebon still experiences overland flow and flooding during rainy season. The primary causes of flooding include inadequate drainage channels and floodgates; blocked culverts; lack of maintenance, including of solid waste; and structures built over drainage channels impede water flow.[37]

SLUMS. Drainage coverage in slum areas ranges between 58% to 97% based on length of existing channels, with the lowest coverage in Kawasan Argasunya. Between 22% and 68% of drainage channels were either open drains or had visible damage, with the poorest conditions in Kawasan Kesunean.

Further spatial analysis shows that large areas of Kawasan Kesunean, Panjunan, and Pegambiran have poor drainage conditions and are flood-prone (Appendix 4.1).[38] CDIA found that 35% of Kawasan Cangkol Utara was flood-prone, with the southern part of the slum regularly experiencing more than 30 cm of inundation. These figures suggest that slum areas may be vulnerable to waterborne diseases from the combination of stormwater and wastewater during periods of flooding.

DEVELOPMENT PLANS

Cirebon's medium-term plan for drainage infrastructure targets nearly half of the city area, specifically, 33% of commercial areas, 11% of urban residential areas, and 5% of rural residential areas. Service to all areas of the city is included in the long-term plan.[39]

30. Forkalim. 2019. "Domestic Wastewater Management Needs Support" *Drinking Water Magazine*, Edition: 28.
31. Government of Cirebon City. 2020. Local Regulation *(Perda)* No. 3/2020 on Implementation of Urban Drainage Systems.
32. Cirebon City Department of Public Works and Spatial Planning. 2011. *Drainage Master Plan*. Cirebon City.
33. Government of Cirebon City. 2018. Mayoral Regulation *(Perwal)* No. 48/2016 on Position, Roles, Functions, Organizational Structures and Work Procedures of the Public Works and Spatial Planning Agency of Cirebon City.
34. Cirebon City Department of Public Works and Spatial Planning. 2011. *Drainage Master Plan*. Cirebon City.
35. Ibid.
36. Cirebon City Department of Environment (DLH). 2018. *Regional Environmental Management Performance Information Report for 2017*. Cirebon City.
37. Cirebon City Department of Public Works and Spatial Planning. 2011. *Drainage Master Plan*. Cirebon City
38. ur-scape. 2021. *Cirebon City Database*. Future Cities Laboratory. Singapore.
39. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan (RPJMD) 2018-2023*. Cirebon City.

4.5 SOLID WASTE MANAGEMENT

POLICY AND PLANNING FRAMEWORK

The Government of Indonesia defines solid waste management (SWM) as a systematic, comprehensive, and sustainable activity that includes waste reduction and management. It further identifies three types of solid waste: 1) domestic waste; 2) commercial waste, generated by non-household sources; and 3) hazardous waste.[40] For the period 2020-2024, GOI's policy is access to effective waste management in urban areas for 80% of households.[41] The GOI further aims for 19 million households to be served by landfills (TPA) that meet sanitary standards. Though aligned with the RPJMN, MPWH's policy aims higher, with access to effective waste management for 100% of households. Its strategy is to improve settlement infrastructure services using a "smart living" approach.[42] Two national laws regulate waste management: one focused on municipal solid waste management;[43] and one that regulates industrials and hazardous waste.[44]

Cirebon City's solid waste management policies are based on national laws and further regulate waste management licensing, funding and compensation, role of the community, incentives, and other administrative procedures.[45] Local policies and strategies for managing domestic waste for the period 2018-2025 are further regulated in Mayoral Decree No. 6/2019.

INSTITUTIONAL ARRANGEMENTS

The Department of Environment (DLH) is responsible for solid waste management in Cirebon City (Figure 4.4). The Solid and Hazardous Waste Management Bureau sets policy while two technical implementation units (UPTD) implement service delivery. The Solid Waste Management UPTD oversees all processes prior to landfill disposal such as collection, sorting, and conveyance, while the Landfill Management UPTD oversees landfill operations and waste processing. The heads of each UPTD report directly to the director of DLH and also supervise an administration division.[46]

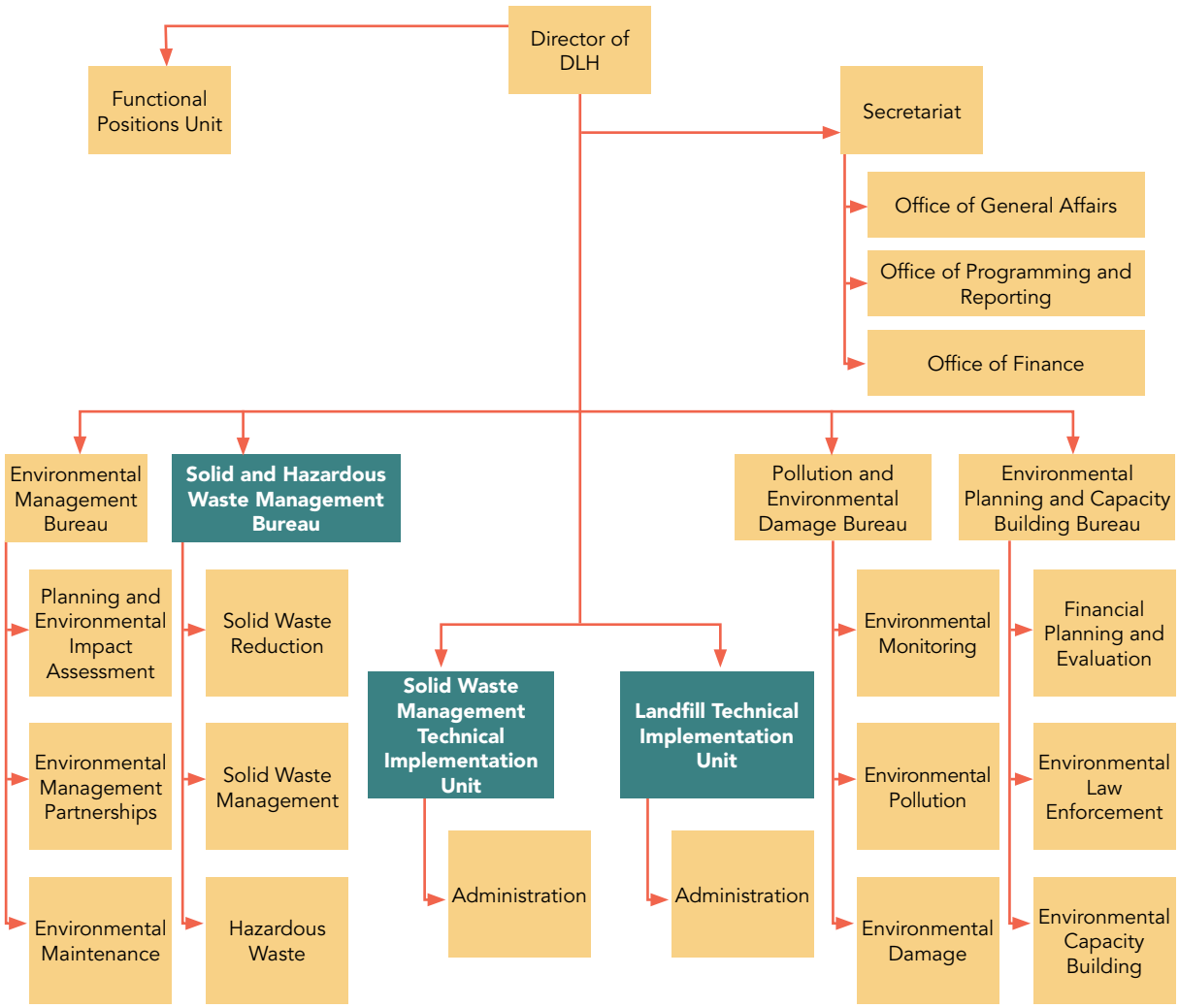
EXISTING SERVICE DELIVERY

CITYWIDE. The city generates approximately 270 tons of waste per day on average, comprising 130 tons of household waste, 82 tons of marketplace waste, 35 tons of commercial waste, 10 tons of waste from public facilities, 8 tons of waste collected off the streets, and 7 tons of waste from other sources.[47] Of that, approximately only 67% is disposed of in the landfill, partly due to an insufficient number of mobile TPS vehicles.
Solid waste management services cover approximately 70% of the city area.[48] The city's waste disposal scheme flows from households to temporary storage facilities (TPS) and then to the landfill (TPA). Cirebon has 24 TPS, each with an approximate capacity of 6-12 m^3.[49] Only 17 are actively operating, while three have been closed and replaced by mobile TPS vehicles. Another four are non-operational.

Cirebon has one landfill located in Kelurahan Argasunya, about eight km from the city center and 70 m above sea level. It has been in operation since 1999. Its total land area is around 14 ha of which 7 ha is currently used. It has a capacity of approximately 1200-1500 m3 and will be full within five years.[50] The landfill is not considered sanitary as it lacks leachate treatment facilities, gas control pipes, weighbridge, fence, drainage, control wells, and water supply.[51]

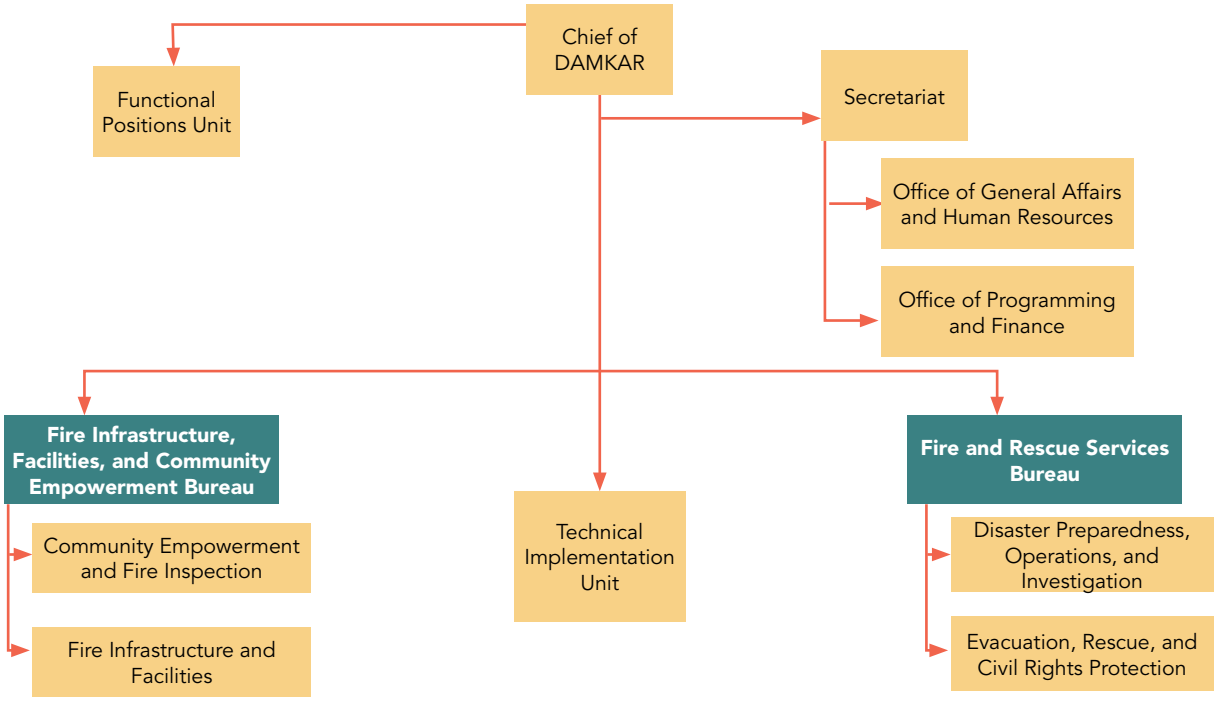
SLUMS. In slums and other neighborhoods with narrow roads that preclude passage of hand carts, in theory, a communal collection system is used whereby households take domestic waste to garbage collection points and containers provided by DLH. However, in five of six slum areas in Cirebon City, at least

40. Government of Indonesia. 2012. Government Regulation (PP) No. 81/2012 on Waste Management Household Waste and The Other Household Waste.
41. Government of Indonesia. 2020. Presidential Regulation *(Perpres)* No. 18/2020 on National Medium-Term Development Plan (RPJMN) 2020-2024. Jakarta.
42. See footnote 2, this chapter.
43. Government of Indonesia. 2008. Law (UU) No. 18/2008 on Solid Waste Management.
44. Government of Indonesia. 2009. Law (UU) No. 32/2009 on Environment Protection and Management.
45. Government of Cirebon City. 2018. Local Regulation *(Perda)* No. 4/2018 on Solid Waste Management.
46. Government of Cirebon City. 2018. Mayoral Regulation (*Perwal*) No. 14/2018 on Formation, Position, Roles and Functions, Organizational Structures and Work Procedures of Technical Implementing Units at Departments in Cirebon City.
47. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City.* Manila.
48. Ibid.
49. Cirebon City Department of Environment. 2019. *Presentation on Environmental Agency Targets for 2020.* Cirebon City.
50. Interviews with DLH. 26-28 February 2020.
51. Ibid.



Source: Mayoral Regulation *(Perwal)* No. 55/2016.

Figure 4.4 Organizational chart for solid waste management by DLH



Source: Mayoral Regulation *(Perwal)* No. 51/2016.

Figure 4.5 Organizational chart for fire services by DAMKAR

two-thirds of families lack access to garbage collection points. No families in Kawasan Cangkol Utara have garbage collection points, and only 5% and 8% of those in Kawasan Argasunya and Pekalipan have these facilities, respectively.[52]

Solid waste management practices are similarly poor, with less than half of families collecting, sorting, and transporting domestic waste in four of six slum areas. Interestingly however, 97% of families in Kawasan Argasunya practice solid waste management,[53] perhaps correlated with their proximity to the city landfill.

DEVELOPMENT PLANS

Key development plans for Cirebon City's solid waste management sector for 2019 include increasing solid waste infrastructure and facilities, such as motorized waste carts and compactor trucks; developing a solid waste management system using 3R principles (reduce, reuse, and recycle); developing waste banks; piloting waste sorting at the *rukun warga* level; and constructing a Regional Waste Processing and Landfill Site (TPPAS). The planned location for this regional landfill is in Cirebon Regency. Three districts will use the landfill for final disposal: Cirebon City, Cirebon Regency, and Majalengka Regency.[54]

4.6 FIRE PROTECTION INFRASTRUCTURE

POLICY AND PLANNING FRAMEWORK

Cirebon has two local regulations for fire protection. One outlines the Fire Department's mandate,[55] while the other sets retribution rates for inspection of fire extinguishers.[56] The latter is intended to supervise and control fire extinguisher inspection services as well as support collection of own-source revenue (PAD) from retribution.

INSTITUTIONAL ARRANGEMENTS

The Cirebon City Fire Department (DAMKAR) sets fire protection policies and implements government affairs in the field of public order and peace, as well as community protection (Figure 4.5). DAMKAR is divided into two bureaus: 1) Fire Infrastructure, Facilities, and Community Empowerment; and 2) Fire and Rescue Services.[57] The former oversees community empowerment in fire prevention, inspection of fire protection equipment, and maintenance of fire facilities and infrastructure. The latter is responsible for fire suppression and rescue services, including fires from hazardous materials.

EXISTING SERVICE DELIVERY

CITYWIDE. In 2019 alone, Cirebon experienced 255 incidents of fire, a 31% increase from the previous year, which saw 194 incidents of fire. In 75% of the 255 cases, DAMKAR's response time met the benchmark time goal set in its standard operating procedure.[58]

DAMKAR's main challenges in fire response relate to the water supply system itself. As fire hydrant water is connected to the drinking water supply system, it is similarly impacted by low water pressure and undersized pipes, particularly in densely populated areas. In 2018, filling a fire tanker took 30 minutes.[59] To mitigate these challenges, each *kelurahan* office is equipped with a dedicated water storage tank that responders can use to fill tankers more quickly.

Other fire protection challenges relate to DAMKAR's fire service fleet. Currently, the reach of its aerial ladders is limited to approximately six stories high although several buildings exceed this number of floors. Additionally, DAMKAR's fleet size is only one-seventh of the size needed to serve the Cirebon population. Although the ideal ratio of fire protection vehicles to residents is 1:5,000, DAMKAR's fleet currently has only ten units.[60] The fleet itself is also ailing, as five units are damaged and only two are operating.[61]

SLUMS. In three slum areas, 90-100% of residential buildings have fire protection infrastructure such as water supply, road access, or fire detection systems. In the remaining three slum areas

52. Calculations based on 2020 KOTAKU data.
53. Ibid.
54. Yanuar, R. 2017. "*Role of the Department of Environment (DLH) of Cirebon City in Waste Processing*" (accessed 24 February 2021).
55. Government of Cirebon City. 2016. Mayoral Regulation *(Perwal)* No. 51/2016 on Position, Roles and Functions, Organizational Structures and Work Procedures for Fire Department in Cirebon City.
56. Government of Cirebon City. 1999. Local Regulation *(Perda)* No. 1/1999 on Retribution for Inspection of Fire Extinguishers.
57. Government of Cirebon City. 2016. Mayoral Regulation *(Perwal)* No. 51/2016 on Position, Roles and Functions, Organizational Structures and Work Procedures for Fire Department in Cirebon City.
58. Government of Cirebon City. 2019. *Cirebon Satu Data*: Incidents of Fire in Cirebon City. (accessed 15 March 2021).
59. Radar Cirebon. 2018. "Limited Hydrants in Cirebon City" (accessed 15 March 2021).
60. Radar Cirebon. 2019. "Many high buildings, firefighters are only able to reach 6 floors" (accessed 15 March 2021).
61. Fajar Cirebon. 2021. "Limited Fire Vehicles in Cirebon City" (accessed 15 March 2021).

however, only 31% to 70% of residential buildings have access to fire protection infrastructure, with those in Kawasan Kesunean least protected. Across all slum areas, zero residential buildings have access to fire protection equipment such as fire extinguishers or fire fighting vehicles. These data suggest that fire protection services in slum areas may be severely inadequate.

DEVELOPMENT PLANS

The city government plans to repair three vehicles in its fleet and increase the number of fire protection vehicles.[62] It has also requested owners of buildings with a height exceeding six stories to have a fire extinguisher on every floor.

4.7 PUBLIC SPACE

POLICY AND PLANNING FRAMEWORK

The General Spatial Plan (RTRW) requires that, at minimum, 30% of the city's land area must constitute green open space (RTH) to promoted a balanced urban ecosystem, hydrological system, and microclimate, which will thereby support clean air, community, and the aesthetic value of the city.63 Of the 30% minimum green open space, 20 percentage points must be public and provided by the city government, while 10 percentage points can be provided by public or private sectors in the form of undeveloped land that can function as a water catchment area or park.[64]

While the Government of Indonesia has policies on green open spaces (RTH), its spatial planning documents do not clearly mandate that these spaces be usable for programs and activities. Planning documents further do not clearly regulate other types of public space, such as streets, sidewalks, or plazas. However, for the period 2020-2024, MPWH has included rehabilitation and development of 5,555 educational, sports, and market facilities as part of its strategic priority to increase access to housing and adequate, safe, and affordable housing infrastructure using a "smart living" approach.[65]

INSTITUTIONAL ARRANGEMENTS

The Department of Housing and Settlements (PERKIM) is responsible for landscaping and maintenance of parks and planters, including trees within landscaped medians and sidewalk parkways (Figure 4.7).[66] Reporting directly to the department director, the Landscaping and Cemeteries Technical Implementation Unit (UPTD) manages green open spaces in Cirebon.

EXISTING SERVICE DELIVERY

CITYWIDE. With an area of 3,736 ha, Cirebon must have at least 1,121 ha (30%) of green open space, with 747 ha (20%) public green open space and 374 ha (10%) private green open space. In 2010, although approximately 24% of total land area was green open space, two-thirds were considered private and less than 10% considered public.[67] However, research on Cirebon's green open space found that by 2014, public green open space had decreased to only 5% percent of land area, suggesting that the share of public green open space may be in decline. [68]

City parks in Cirebon have an ecological function and a social function. However, because Cirebon has a limited number of city parks that can support community programs and activities such as sports, playgrounds, or gatherings, the social function of city parks has yet to be realized. As of 2020, Cirebon had 49 city parks, including landscaped medians and traffic circles, totaling approximately 3 ha. The city plans to have private enterprises manage up to 16 city parks through a Corporate Social and Environmental Responsibility (TJSL) mechanism.[69]

SLUMS. Approximately 27% of the city's slum areas are not located within a 10-minute walk (800 m) from a public park or sports facility (Figure 4.6, Appendix 4.9).[70] Kawasan Argasunya has the least access to these two types of public spaces, followed by Kawasan Panjunan. These data suggest that slum areas in Cirebon City may have limited public green open space for socializing and recreation.

62. Fajar Cirebon. 2021. "Limited Fire Vehicles in Cirebon City" (accessed 15 March 2021).
63. Government of Cirebon City. 2012. Local Regulation (*Perda*) No. 8/2012 on Cirebon Spatial Plan (RTRW) 2011-2031.
64. Ibid
65. See footnote 2, this chapter.
66. Government of Cirebon City. 2019. Mayoral Decree (SK) No. 100/2019 on Implementation Details of Government Affairs in the Field of Public Works and Spatial Planning, Housing and Settlements, and Environment.
67. Government of Cirebon City. 2012. Local Regulation *(Perda)* No. 8/2012 on Cirebon Spatial Plan (RTRW) 2011-2031. Ten percent of total land area.
68. Lestiari et al. 2014. "Analysis of the Potential Development of Public Space in Cirebon City." *Jurnal Konstruksi Unswagati Cirebon* (accessed 15 March 2021).

However, field observations of Kawasan Cangkol Utara show at least one main public gathering space in front of the Jami Bahrul Falaah Mosque. Though the markings are faded, boundary lines and a center circle are visible on a paved area in front of the mosque, with football goal nets at either end. A raised platform sits opposite the mosque and marks the end of the space. These features suggest that while slum areas may not have formal public recreational spaces, they may have informal spaces for socializing and gathering. As no data are available on these informal public spaces, additional field observations would be needed to form a more complete picture of this sector.

DEVELOPMENT PLANS

Through 2031, the city aims to meet its target of 20% land area for public green open space mainly by adding approximately 115 ha of city forest in Harjamukti; 60 ha of new city parks; and over 1,500 new parks at the kelurahan, rukun warga, and rukun tetangga levels.[71] Due to limited land availability for public green open space, the city has been experimenting with adaptive reuse of land. Since 2018, DLH has converted three temporary household waste disposal sites (TPS) into public parks. As the agency transitions from stationary to mobile TPS vehicles, it plans to convert 20 TPS sites into additional public parks.

In 2021, the city plans to implement two public green open space programs related to the city's cultural heritage. First, the city plans to revitalize British-American Tobacco (BAT) Park, an area adjacent to the British-American Tobacco Building, a former cigarette factory in operation between 1924 and 2010 and now a city-designated cultural heritage site. The city also plans to historically replicate and restore the site of the *Kereta Pedati Gede*, a 12-wheeled carriage that holds deep symbolic meaning for Cirebon's Islamic community.[72] Both city parks will include public facilities such as child-friendly play areas.

4.8 HOUSING AND SHELTER

POLICY AND PLANNING FRAMEWORK

To address challenges of housing quantity, quality, and affordability, the Government of Indonesia instated the "One Million Houses" *(Satu Juta Rumah)* policy to provide one million newly constructed homes through public and private financing. For the period 2020-2024, GOI's targets are to provide public rental housing flats (RUSUNAWA) and public housing flats for sale (RUSUNAMI) that are integrated with the public transportation system.[73] Aligned with the RPJMN, MPWH's target for affordable housing provision is 51,340 public housing *(rumah susun)* units, with 70% of households occupying decent and affordable housing.[74]

Satu Juta Rumah primarily targets low-income households (MBR, *Masyarakat Berpenghasilan Rendah*) for government housing subsidies. The policy includes:[75]

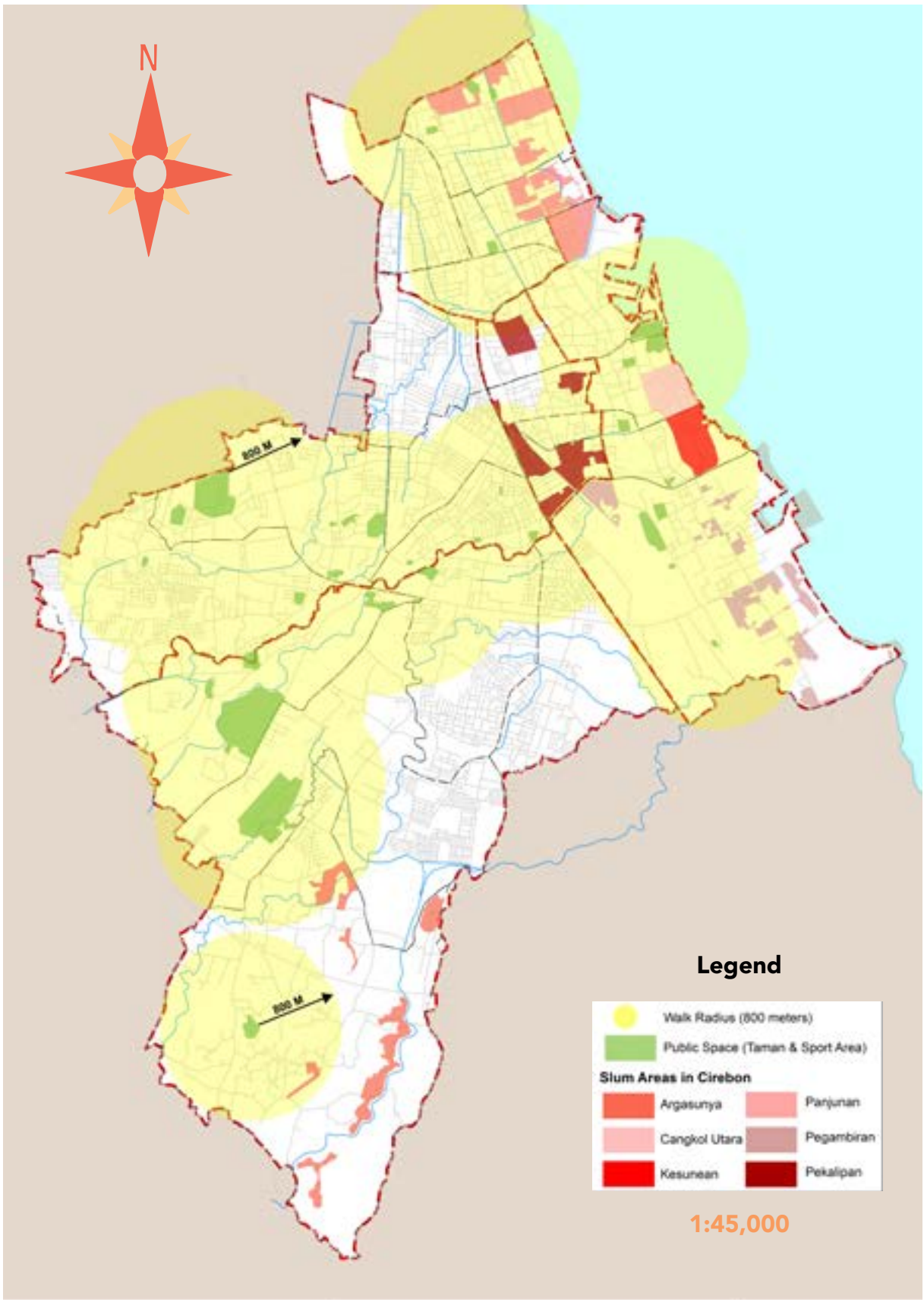
- regulations on taxation, financing, and land use for housing development;
- provision of housing for low-income households, including RUSUNAWA, special-purpose houses (RUSUS), and home improvement subsidies (BSPS, *Bantuan Stimulan Perumahan Swadaya*); and
- access to housing finance through credit-linked programs, including mortgage-linked subsidies (KPR, *Kredit Perumahan Rakyat*).

Housing and shelter development is further regulated by the Housing and Settlements Development Plan (RP3KP), a multi-level planning document meant to guide housing provision activities. The city-level RP3KP is meant to reference its respective provincial-level RP3KP, along with its respective city-level General Spatial Plan (RTRW). Currently, Cirebon City has not yet prepared a RP3KP as the West Java RP3KP is still in progress.

INSTITUTIONAL ARRANGEMENTS

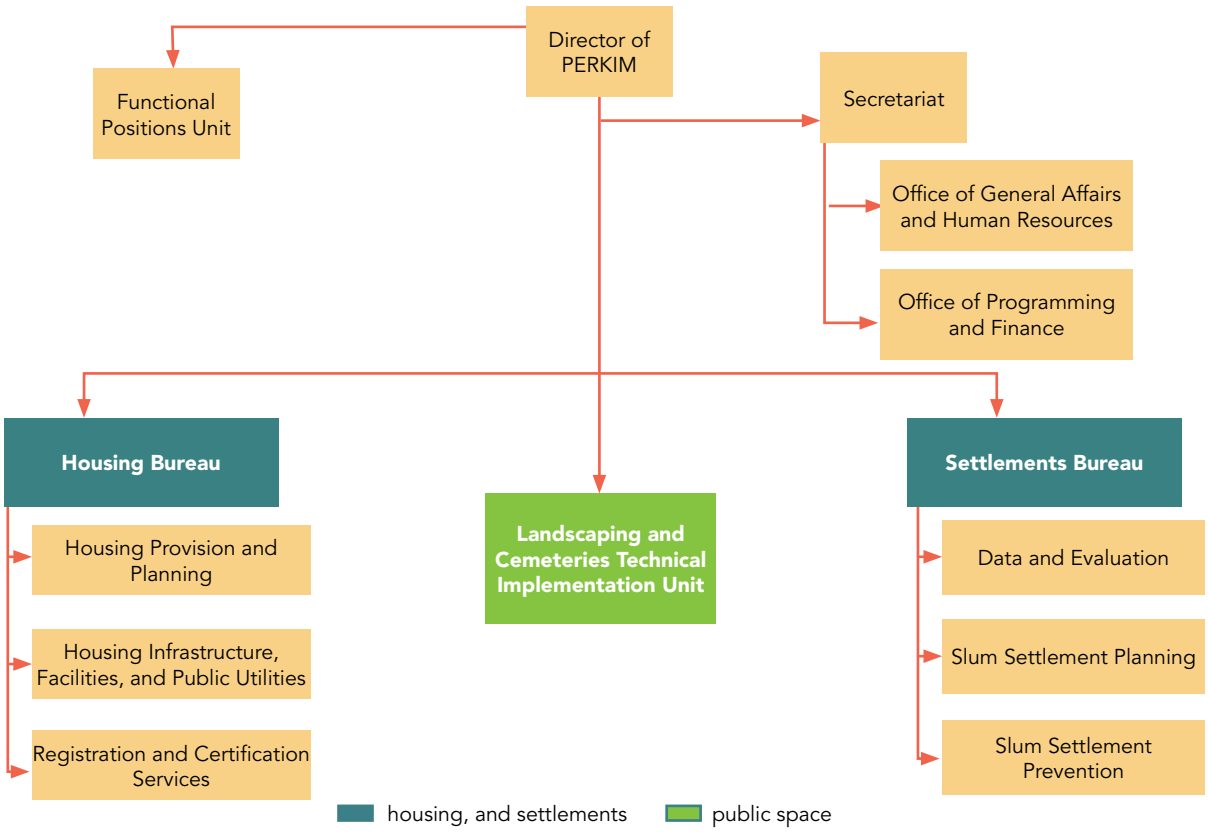
The Department of Housing and Settlements (PERKIM) is responsible for provision of housing and settlements

69. Government of Cirebon City. 2019. Mayoral Decree (SK) No. 460/2019 on Appointment of Management Board for Taman Jalan of Cirebon City through Social and Environmental Responsibility (TJSL) Company.
70. ur-scape. 2021. *Cirebon City Database*. Future Cities Laboratory. Singapore.
71. Government of Cirebon City. 2012. Local Regulation (*Perda*) No. 8/2012 on Cirebon Spatial Plan (RTRW) 2011-2031.
72. Radea, P. 2020. "Cirebon City has the longest carriage in the world" (accessed 22 January 2021).
73. Government of Indonesia. 2020. Presidential Regulation *(Perpres)* No. 18/2020 on National Medium-Term Development Plan (RPJMN) 2020-2024. Jakarta. Listed as Major Project No. 34.
74. See footnote 2, this chapter.
75. World Bank. 2020. *Indonesia Public Expenditure Review: Chapter 10 Housing*. Jakarta.



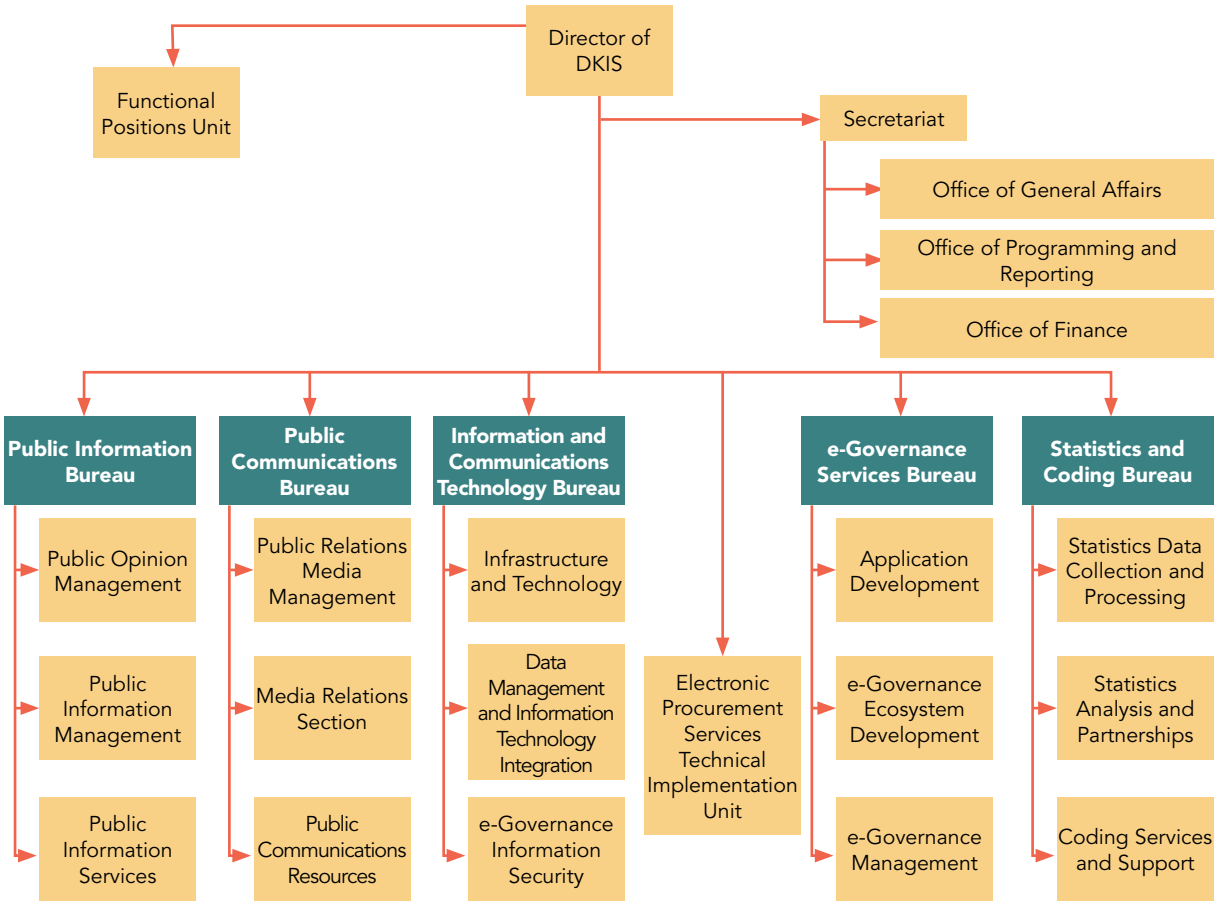
Source: Based on data from Cirebon City KOTAKU.

Figure 4.6 Distance from slum areas to public green open space, by 10-minute walk radius (800 m)



Source: Mayoral Regulation *(Perwal)* No. 49/2016.

Figure 4.7 Organizational chart for management of public space, housing, and settlements by PERKIM



Source: Mayoral Regulation *(Perwal)* No. 59/2016.

Figure 4.8 Organizational chart for mobile and digital services by DKIS

in Cirebon (Figure 4.7). The Housing Bureau sets policy, programs, and activities for housing provision, while the Settlements Bureau is responsible for residential area planning as well as setting infrastructure policy, programs, and activities that support housing.

EXISTING SERVICE DELIVERY

CITYWIDE. Currently, housing provision for low-income households in Cirebon largely relies on fiscal assistance from the provincial and central governments, especially through home improvement subsidies (BSPS) from MPWH. In 2020, intergovernmental transfers from the provincial government supported 300 housing units while BSPS subsidies supported improvements to 100 housing units.[76] However, PERKIM data show that approximately 4,900 housing units in Cirebon needed assistance for home improvement.[77]

In terms of public housing types, Cirebon does not yet have any public housing blocks *(rumah susun)*. However, in 2019, researchers from the Cirebon College of Technology (STTC, *Sekolah Tinggi Teknologi Cirebon*) studied the feasibility of developing *rumah susun* to meet housing needs.[78] Analyzing population projections against housing stock, the study's key findings estimate:

- in the next ten years, Cirebon City will need the equivalent of 40 eight-story apartment buildings (7 ha) which may physically reduce slum settlements by 50%;
- land from the Kesenden Football Field could be converted into seven public housing blocks or four public housing blocks with nearby facilities for trade, services, and social functions; and
- only 55% of the population surveyed showed willingness to live in public housing blocks, and 62% wanted to live near a commercial center.

SLUMS. Slum areas in Cirebon City vary widely in terms of building irregularity, or conformance with the zoning code. While data show that nearly all residential buildings in Kawasan Cangkol Utara meet zoning code and urban design guidelines, only 6% of those in Kawasan Argasunya conform with the zoning code. However, as the city has not yet finalized its zoning code as of this writing, it is unclear how this slum indicator has been measured.

Building quality in slum areas is moderately varied, with between 74% and 96% of residential buildings across slum areas in conformance with the building code. While Kawasan Argasunya has the fewest residential buildings that meet the zoning code, it has the highest number that meet the building code. The relatively high percentage of buildings that meet life safety requirements in slum areas may be correlated with security of land tenure, which may give slum households confidence to invest in more permanent structures.

DEVELOPMENT PLANS

For resettlement of slum areas in Kelurahan Panjunan (detailed in Chapters 2 and 3), the central government has allocated US$835,000 (Rp12 billion) to the project, while the city government has allocated an additional US$97,000 (Rp1,4 billion) for land acquisition and compensation for 105 families and 85 households in the affected *rukun warga*. Another US$3.5 million (Rp50 billion) has been allocated for construction of the two *rumah susun*, including site preparation, architectural, and engineering works. Construction of these public housing blocks is planned for 2021.[79]

4.9 MOBILITY AND TRANSPORTATION

POLICY AND PLANNING FRAMEWORK

In 2019, Cirebon City instated mobility and transportation policies that aim to promote economic development and improve social welfare, in alignment with the RTRW and the national and provincial transportation planning framework.[80] The regulation includes guidance for roads and supporting infrastructure including road signs, road markings, public street lighting, parking, pedestrian infrastructure, cycling infrastructure, infrastructure for persons with disabilities, and traffic engineering management. Pedestrian infrastructure includes sidewalks, pedestrian bridges, pedestrian crossings, and public lobbies. For cycling, infrastructure includes dedicated bike lanes and bike

76. DPRD of Cirebon City. 2020. "DPRD Commission II Asks DPRKP to Prioritize RUTILAHU Assistance Programs" (accessed 15 January 2021).
77. Ibid.
78. Ibid.
79. Radar Cirebon. 2020. "Budget Revision for Coastal Panjunan" (accessed 15 January 2021).
80. Government of Cirebon City. 2019. Local Regulation *(Perda)* No. 2/2019 on Implementation of Transportation.

shelters. Furthermore, the regulation emphasizes that persons with disabilities have the right to special services in public spaces and that city government and private sector are required to provide accommodations accordingly.

INSTITUTIONAL ARRANGEMENTS

Multiple authorities are responsible for transportation infrastructure and systems within Cirebon City. The central government through the Ministry of Transportation (MoT) is responsible for land transportation by rail, sea transportation, and air transportation. MoT also operates and maintains Type A bus terminals.

The Department of Transportation (DISHUB) is responsible for setting citywide land transportation policy for wheeled vehicles. DISHUB also operates and maintains Type C bus terminals. The Land Transportation Organization of Cirebon City and Regency (Organda) meanwhile regulates public transportation routes, including for share taxis (*angkot*), buses, and bus rapid transit (BRT). Organda also connects private transportation entrepreneurs to financial capital.

EXISTING SERVICE DELIVERY

CITYWIDE. Road typology in Cirebon includes state roads, provincial roads, and city roads, managed by their respective authorities.[81] Several toll roads also serve the Cirebon area, including the Cikopo-Palimanan *(Cipali)*, the Palimanan-Kanci *(Palikanci)*, and the Kanci-Pejagan.

The city also has two passenger bus terminals: Harjamukti Terminal (Type A); and Dukuh Semar Terminal (Type C), located just behind the former. The Harjamukti Terminal is the city's main transportation hub and serves as a passenger terminal for intercity and interprovince transportation. The Dukuh Semar Terminal was also a passenger terminal, in this case for intercity and intracity transportation, but the terminal is in disrepair and has been closed for several years. In terms of passenger rail, the Jakarta-Surabaya Railway stops at train stations in the city center: Kejaksan Station, for non-economy fares; and Prujakan Station, for economy fares.

For transportation by sea, the Port of Cirebon includes a passenger terminal in addition to cargo terminals for coal, bulk oil, and palm oil. The port area also includes a Nusantara fishing port (PPN) and four traditional fish landing points (TPI): Kesenden, Sukalila, Cangkol, and Kesunean. Two airports also serve the city: Kertajati International Airport, the city's main airport for commercial flights, though located approximately 62 km from the city center; and Cakrabhuwana Airport, a small airport located in Kecamatan Harjamukti, which mainly receives flights for state officials and flight training.

SLUMS. Access to neighborhood roads in slum areas is high, ranging from 91% to 100% coverage. However, between 15% to 59% of roads across all slum areas have visible damage, with those in Kawasan Pegambiran in the poorest condition. No data are available on transportation or urban mobility preferences of slum communities.

DEVELOPMENT PLANS

Since 2017, the city government has planned to revitalize the former Dukuh Semar Terminal to compensate for own-resource revenue (PAD) lost in the transfer of the Harjamukti Terminal to MoT.[82] DISHUB envisions Dukuh Semar Terminal as a Type C passenger terminal that would serve as a transportation hub for intercity *angkot* and BRT lines. However, the 2021 budget planned for the redevelopment has since been reallocated.[83]

Relatedly, ten BRT buses will begin operating in 2021 supported by a grant from MoT. DISHUB plans to develop two BRT lines, one for intracity transportation and the other for intercity. The BRT system will be managed by the city's Regional Development Company (PD Pembangunan) and will later collaborate with Organda and the private sector.[84] The city government plans to transfer US$35,000 (Rp500 million) to PD Pembangunan for BRT operations.[85]

81. Government of Indonesia. 2006. Government Regulation (PP) No. 34/2006 on Road Network.
82. Radar Cirebon. 2017. "Transportation Agency Utilizes Dukuh Semar Terminal to Add PAD" (accessed 9 March 2021).
83. Suara Cirebon. 2021. "Dukuh Semar Terminal Revitalization Canceled Again" (accessed 9 March 2021).
84. Suara Cirebon. 2021. "BRT is planned to start operating in early April" (accessed 9 March 2021). *Perusahaan Daerah* (PD) is a company whose assets are fully controlled by the city government (city-owned enterprise).
85. Kumparan. 2021. "Bus Rapid Transit is Confirmed to Operate in Cirebon City This Year" (accessed 9 March 2021).

Aviation authorities also plan to develop the city's Cakrabhuwana Airport into a commercial airport to support regional economic development.[86]

4.10 MOBILE AND DIGITAL CONNECTIVITY

POLICY AND PLANNING FRAMEWORK

For the period 2005-2025, the Government of Indonesia aims to develop an "Indonesian Information Society," a policy toward an informed society through the Information and Communications sector.[87] Local regulations currently only outline the role and responsibilities of the Department of Information, Communications, and Statistics (DKIS).[88] DKIS also implements the city's Smart City Program according to the following six strategies: Smart Governance; Smart Branding; Smart Economy; Smart Living; Smart Society; and Smart Environment.

INSTITUTIONAL ARRANGEMENTS

DKIS is responsible for mobile and digital connectivity in Cirebon (Figure 4.8). Reporting to the department director, five bureaus set policy regarding public information management; public communications; information and communications technology; e-governance; and statistics and coding. A regional technical implementation unit (UPTD) also reports directly to the agency director and is responsible for electronic procurement services.

EXISTING SERVICE DELIVERY

CITYWIDE. Currently, a network of base transceiver stations (BTS) serves the city, with stations distributed such that city residents generally do not have difficulty accessing wireless communication or the internet.[89] Between 2015 and 2017, internet usage has increased from 30% to 40% among city residents ages five and older, while mobile phone usage has decreased from 70% to 68% of the population.[90] However, awareness of the benefits of the internet is still low among certain populations, while the city still has few locations for public internet access despite efforts to provide free Wi-Fi in public spaces.[91]

In terms of software, the city government has developed at least 15 mobile and digital technologies related to governance, health, tourism, and social services, including:[92]

- Siduga (*Sistem Informasi Pengaduan Warga*), where city residents can file complaints through the online mobile application;
- Cirebon Lengko (*Layanan Elektronik Kesehatan Online)*, an online queuing service where city residents can check the number of available inpatient rooms at Gunung Jati Cirebon Hospital;
- Cirebon Brojol Aja Klalen (*Akte Langsung Jadi Kalau Lapor Lewat Online*), where city residents can receive same-day service for birth certificates requested through the online system;
- *Cirebon Melet*, a program to provide free Wi-Fi in public areas, public facilities, educational facilities, and community empowerment agencies (Bapermas); and
- *Cirebon Satu Data*, an online database for datasets from city agencies.

DEVELOPMENT PLANS

Regarding physical infrastructure, the city government plans to development basic telecommunications in all special zoning districts (BWP) in the city, including:

- development of the telecommunications network, which will follow the road network and classification hierarchy, with service coverage to all service centers and development areas;
- development of a cable network infrastructure,

86. Radar Cirebon. 2019. "Penggung Airport is Ready to Become a Commercial Airport" (accessed 9 March 2021).
87. Government of Indonesia. 2007. Law (UU) No. 17/2007 on National Long-Term Development Plan *(RPJPN)* 2005-2025. Jakarta.
88. Government of Cirebon City. 2016. Mayoral Regulation *(Perwal)* No. 59/2016 on Position, Organizational Structure, Duties and Functions, and Work Procedures of DKIS.
89. Cirebon City Land Administration Office. 2020. *Presentation on Disaster Prone Area Arrangement FY 2020.* Cirebon City
90. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan (RPJMD) 2018-2023.* Cirebon City.
91. Cirebon City Land Administration Office. 2020. *Presentation on Disaster Prone Area Arrangement FY 2020.* Cirebon City
92. Government of Cirebon City. 2018. *Smart City Master Plan for Cirebon City.* Cirebon City.

in the form of wires and construction of cable houses to serve telecommunication needs in all special zoning districts; and

- development of underground telecommunications network that is integrated with the water supply network and electrical cable network.

The city government also plans to provide telecommunication towers to support wireless communications; to develop the cable television system by providing transmission stations in all special zoning districts; and to provide fiber optic networks by constructing cable houses to serve telecommunications needs.

In terms of software, in 2021, DKIS plans to provide free WiFi and to develop several digital tools to improve citywide communication, most notably for online participatory spatial planning and electronic participatory budgeting *(e-Musrenbang)*.[93]

4.11 ENERGY

POLICY AND PLANNING FRAMEWORK

The Government of Cirebon City has no local policies or regulations on energy, but rather, references national standards for both electricity and natural gas. Since 2007, due to the rising cost of kerosene subsidies, the Government of Indonesia has implemented a national program to convert domestic kerosene users to liquefied petroleum gas (LPG) for cooking.[94]

INSTITUTIONAL ARRANGEMENTS

PLN UP3 Cirebon, a branch company of the state-owned State Electricity Company (PLN, *Perusahaan Listrik Negara)*, is responsible for electricity services in Cirebon. Similarly, Pertamina Cirebon, a branch company of the state-owned State Oil and Natural Gas Mining Company (PERTAMINA), is responsible for providing natural gas, liquified petroleum gas (LPG), and operating public fueling stations (SPBU) in the city.

EXISTING SERVICE DELIVERY

ELECTRICITY. PLN UP3 Cirebon provides electricity services to Cirebon City and to surrounding regencies. In general, electricity usage in Cirebon is increasing. Between 2012 and 2016, the number of households using electricity increased from 47% to 92%. Existing data show that electricity usage by households still dominates although the share of electricity usage by business and industrial customers has increased annually. However, electricity usage by government buildings and public street lighting have decreased.[95]

The city's power distribution network transmits electrical power between systems using overhead lines and underground cables. The main substations for the electricity network in Cirebon City are located in Kelurahan Sukapura and Kelurahan Sunyaragi.

PLN's tariff structure has different categories depending on the type of user and the potential voltage and current needed. For small residential users, tariff categories range between 450 VA to 2,200 VA. The Government of Indonesia subsidizes electricity for households in the 450 VA category as well as for poor households in the 900 VA category. Tariff category 450 VA could thus potentially be used as a proxy for household poverty.

Although most slum households in Cirebon City use either 450 VA or 900 VA of electricity, the areas vary in their distribution. While 71% of households in Kawasan Panjunan use less than 450 VA of electricity, 84% of those in Kawasan Argasunya use 900 VA. In three slum areas, a small percentage of households do not have electricity at all, most frequently among households in Kawasan Cangkol Utara. These data may be correlated with building quality as well as poverty levels.

GAS. The number of customers for natural gas has also continued to increase annually, aligning with the national energy conversion program. Between 2012 and 2015, the number of households using natural gas increased by approximately 25%, from 12,731 to 15,957 customers.

For liquified petroleum gas, Pertamina Cirebon has an LPG depot located at the Port of Cirebon. Approximately 40% (300 MT) of the LPG is distributed throughout West Java, with the rest distributed throughout Central Java.96 Pertamina also operates 12 public fueling stations (SPBU) in Cirebon.

93. Government of Cirebon City. 2018. *Smart City Master Plan for Cirebon City.* Cirebon City.
94. Government of Indonesia. 2001. Law (UU) No.22/2001 on Oil and Natural Gas; Government of Indonesia. 2006. Presidential Regulation (*Perpres*) No. 5/2006 on the National Energy Policy; Government of Indonesia. 2007. Presidential Regulation (*Perpres)* No. 104/2007 on the Provision, Distribution, and Pricing of 3-kilogram Cylinder LPG; Government of Indonesia. 2009. Ministerial Regulation of Energy and Mineral Resources (Permen) No. 26/2009 on Provision and LPG distribution.
95. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) *2018-2023.* Cirebon City.

No data are available on cooking fuels in slum areas. However, cooking fuel data from a DTKS survey of poor households in Cirebon City show that 84% of respondents use LPG, followed by firewood.[97] Some 2% use biogas, while 1% use kerosene.

DEVELOPMENT PLANS

ELECTRICITY. Plans to improve electricity services include: providing high voltage transmission lines (SUTT) and medium voltage transmission lines (SUTM) in several *kelurahan*; providing low voltage transmission lines (SUTR) throughout the city; developing substations for the electricity distribution network system in Kelurahan Sukapura and Kelurahan Sunyaragi; installing warning signs for high voltage; research on alternative electrical energy sources; and extending coverage to new residential areas and improving electricity services in areas that are planned to be developed.[98]

GAS. Plans to improve gas services include extending coverage to new residential areas and improving gas services in areas with planned development and installing warning signs along the gas network.

Left: Informal food vending is a common livelihood for the urban poor.
Top Right: Women in Kelurahan Argasunya carrying an LPG tank.
Bottom Right: Food vendors typically attach LPG tanks to their carts for cooking.
Source: Asian Development Bank.

96. Pertamina. 2019. "Ensuring LPG Supply, Pertamina Visits LPG Depot Facilities" (accessed 15 March 2021).
97. Government of Indonesia. 2020. Integrated Social Welfare Database (DTKS): "Drinking water source, cooking fuel, and sanitation" (accessed 26 March 2021). No response recorded for 16% of DTKS households.
98. Government of Cirebon City. 2012. Local Regulation *(Perda)* No. 8/2012 on Cirebon Spatial Plan (RTRW) 2011-2031.


ITEM

A playground in the slum area in Kelurahan Lemahwungkuk. Asian Development Bank.

CHAPTER 5

HUMAN CAPITAL: WELL-BEING AND LIVELIHOODS

Human capital comprises areas that advance an individual's opportunities, such as healthcare, education, enterprise and livelihoods, gender and inclusion, and social protection. The report includes these areas to assess the potential for supporting well-being and livelihoods of slum communities to prevent resurgence of slums.

5.1 HEALTH AND HEALTHCARE SERVICES

Although *kelurahan* and slum area-specific data are not available on well-being, proxy measures provide a sense of physical and mental health of the poor in Cirebon City. The National Population and Family Planning Agency (BKKBN)'s Family Welfare Levels (*Tingkat Kesejahteraan Keluarga*) classifies families into five levels of welfare depending on ability to meet needs.[1] In 2020, 71% of Cirebon families (77,493)—were classified as Very Poor, Poor, Near Poor, or Vulnerable to Poverty.[2] Most Very Poor and Poor families live in Kecamatan Harjamukti, followed by Kecamatan Lemahwungkuk (Figure 5.1).

Data on newborn health across all kecamatan also provide a geographic measure of well-being. In 2019, both Harjamukti and Lemahwungkuk had the highest shares of newborns with low birthweight. However, while Lemahwungkuk had the highest share of malnourished newborns at 22%, Harjamukti had nearly the lowest share at 12%. Newborn malnutrition was likewise relatively high in other urban kecamatan and likewise relatively low in other more rural kecamatan. Health in Cirebon thus may plausibly be correlated with better access to nutritious food sources, such as agricultural production.

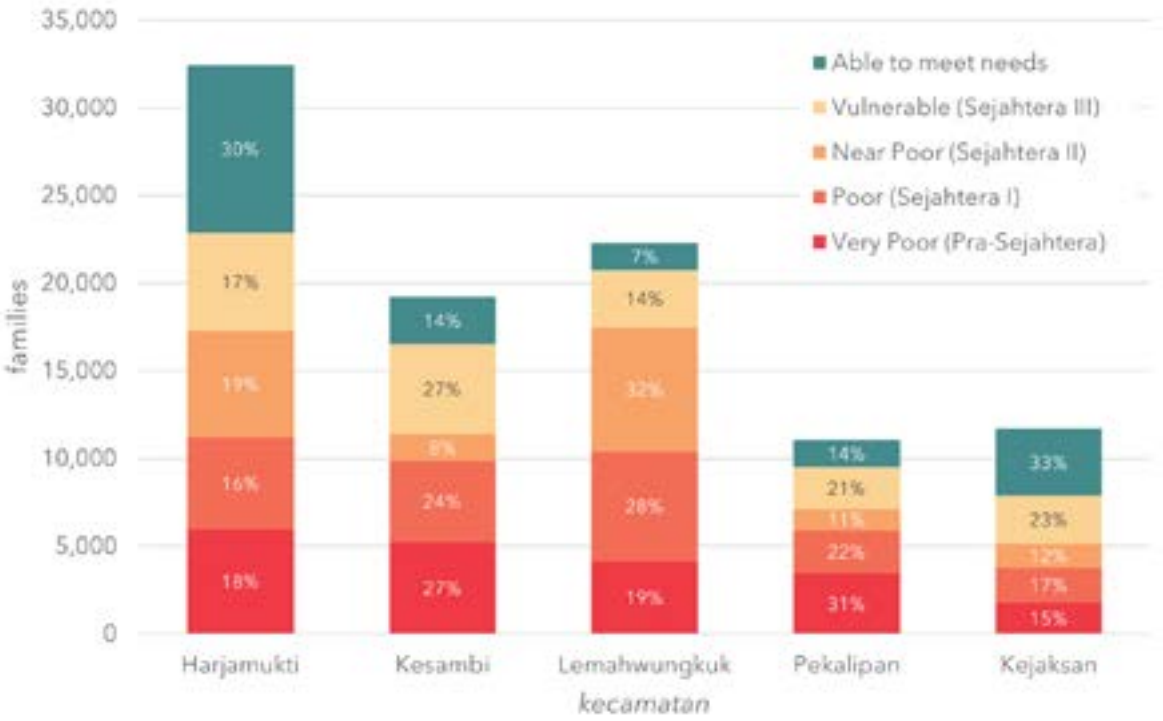
In slum areas, poor sanitation is a potential source of poor health outcomes such as diarrhea, dengue fever, and cholera. Kawasan Cangkol Utara, for example, is not connected to the city sewerage network. Blackwater is discharged directly into the environment through open defecation and overflowing septic tanks. Furthermore, uncollected or illegally dumped solid waste ends up in rivers or stormwater channels where it both impedes water flow and eventually flows into the sea. The open accumulation of solid waste and wastewater thus presents a health hazard for slum residents, daily as they use the seawater for bathing and washing, and during floods as homes and streets become inundated with contaminated water.

ACCESS TO HEALTHCARE

CITYWIDE. Cirebon has seven major types of public healthcare facilities: general hospitals; maternity hospitals; polyclinics; primary health centers (*puskesmas*); auxiliary primary health centers (*pustu*); integrated health service posts (*posyandu*); and maternal and child health centers.

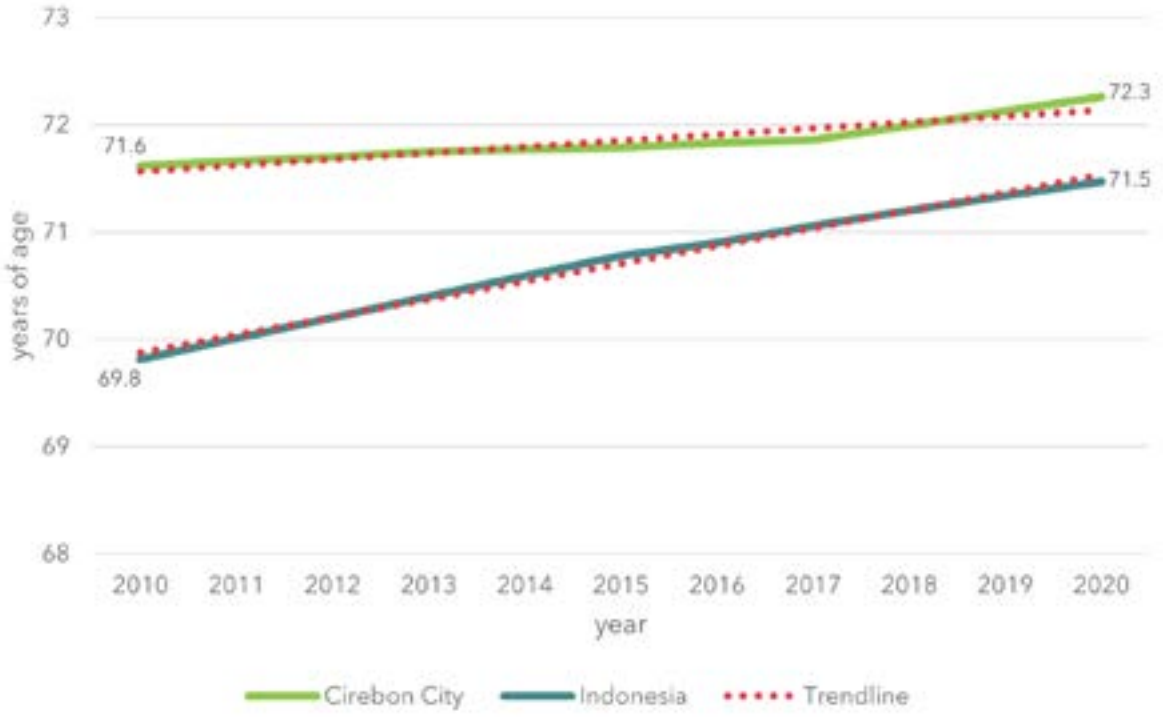
The central government provides guaranteed health services for the poor primarily through the national health insurance (JKN, *Jaminan Kesehatan Nasional*) program. To reduce risk of maternal and neonatal mortality, the central government also provides maternal health services through the Jaminan Persalinan or Jampersal program which targets pregnant women, postpartum mothers, and newborns who are uninsured. In 2014, Cirebon City also launched a fee waiver program for public

1. Very Poor families cannot meet basic needs; Poor families cannot meet psychological needs; Near Poor families cannot meet developmental needs; and Vulnerable to Poverty families cannot meet self-fulfillment needs.
2. Cirebon City Department of Population and Civil Registration. 2020. Welfare; Government of Cirebon City. 2020. *Cirebon Satu Data:* Number of Families and Average Number of Family Members (accessed 10 March 2021).



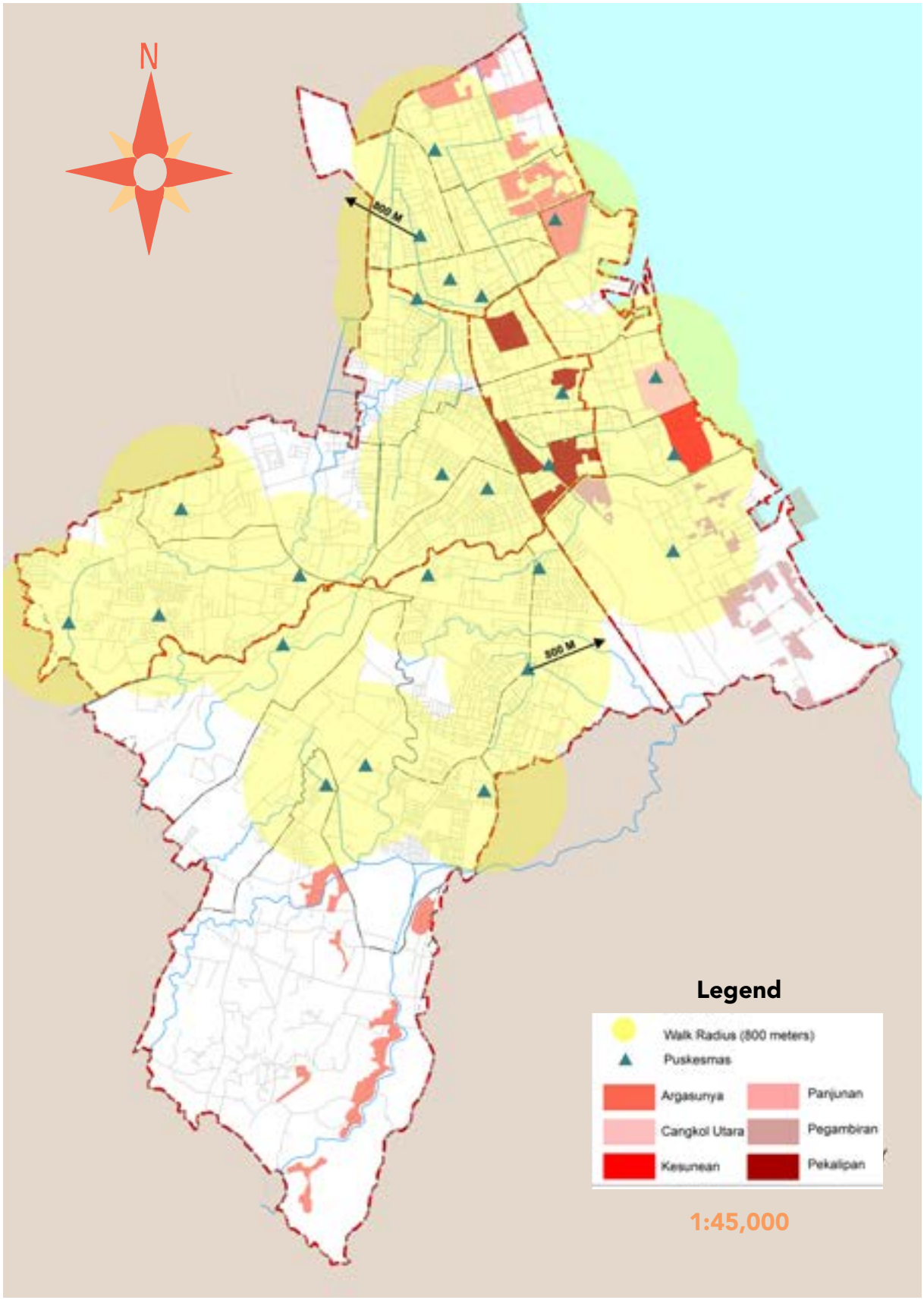
Source: Cirebon City Department of Population and Civil Registration (2020).

Figure 5.1 Number of poor and vulnerable families in Cirebon City



Source: BPS (2021).

Figure 5.3 Life Expectancy Index between 2010 and 2020



Source: Based on data from Cirebon City KOTAKU.

Figure 5.2 Distance from slums to healthcare facilities, by 10-minute walk radius (800 m)

health services. Individuals with a resident identity card (KTP) no longer have to pay for health services at *puskesmas*.

SLUMS. Across all slum areas, between 86% to 99% of slum households in Cirebon City access health services at the *puskesmas*.[3] This preference could be correlated with the role of *puskesmas* as gatekeepers for JKN patients, as these primary health care centers provide referral letters required to seek treatment at a hospital or specialist clinic.[4] Other facilities available to the poor are *posyandu*, community-based service posts operated by trained local health cadres; and *posbindu*, integrated service posts for non-communicable disease prevention. *Posyandu* operate at the *rukun warga* level. In 2019, Cirebon had a total of 331 *posyandu* across all *kecamatan*.[5]

Despite strong preferences for accessing healthcare at *puskesmas*, approximately 55% of total slum areas are not located within a 10-minute walk radius (800 m) of one (Figure 5.2, Appendix 4.3).[6] No part of the highland slums of Kawasan Argasunya is in walking distance of a *puskesmas*, while large areas of the coastal slums of Kawasan Panjunan and Pegambiran are also outside of this radius. Longer travel times to access healthcare may be correlated with poorer health outcomes.

COVID-19. Since the onset of the pandemic, *puskesmas* service time in the city has been limited. To meet public needs and reduce potential virus spread, DINKES has made efforts to provide remote health services. In collaboration with local health cadres, *puskesmas* are providing free prescription delivery services for vulnerable residents, including the elderly, pregnant women, nursing mothers, and children. Patients submit their name, date of birth, address, health card (BPJS) number, KTP number, and description of symptoms through WhatsApp messenger.

The city government has also partnered with the private sector to deliver health services, such as converting hotels into isolation facilities and providing portable handwashing stations in public spaces. [7] For the poor, the city government provides US$7 (Rp100.000) per day of income support during the 14-day isolation period. Free swab tests are also available for city residents at facilities in all *kecamatan*.

QUALITY OF HEALTHCARE

Quality of healthcare in Cirebon City is considered high. Between 2010 and 2020, Cirebon City's Life Expectancy Index increased from 71.6 to 72.3, showing improvement and remaining within the High Development category (Figure 5.3) [8] Compared to the national average, Cirebon City residents also have higher life expectancy at birth. Furthermore, per 1,000 people, the city had 2.1 physicians and 3.8 nurses in 2019, approximately 5 times and 1.5 times higher than the same ratios for Indonesia, respectively.[9] These figures suggest that Cirebon City indeed has higher healthcare quality than in Indonesia overall. However, the local and national trendlines are converging, suggesting local challenges to healthcare delivery.

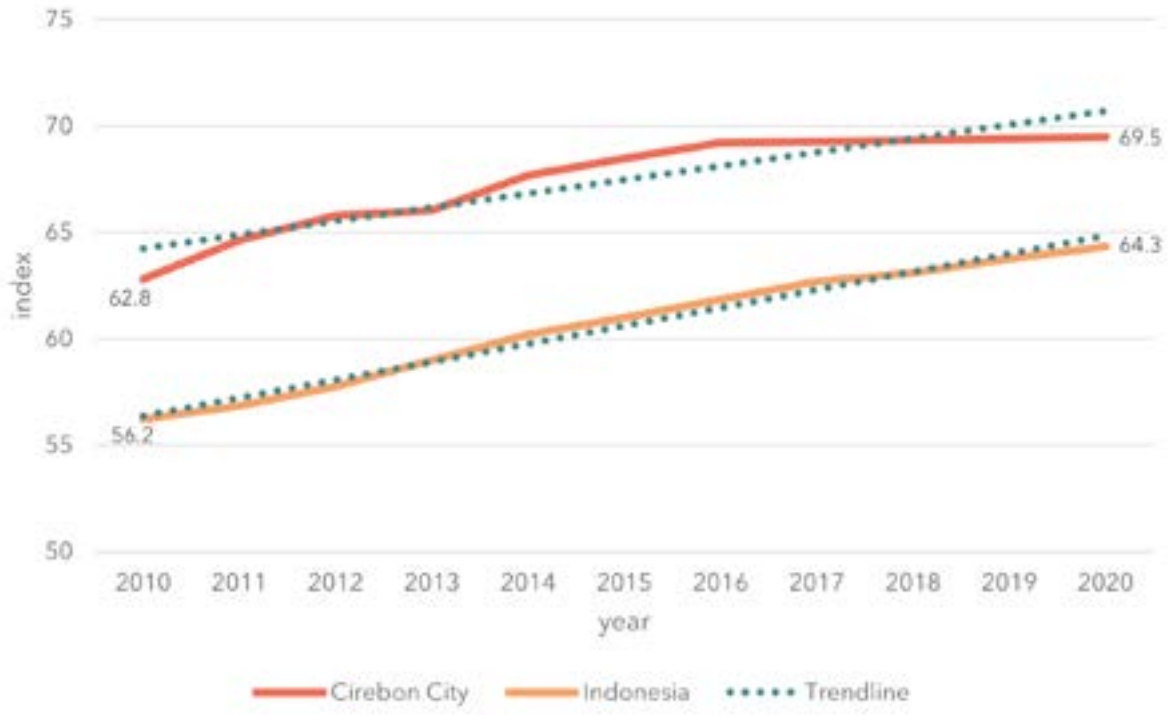
5.2 EDUCATION AND EDUCATIONAL SERVICES

Between 2010 and 2020, Cirebon City's education index increased from 62.8 to 69.5, showing improvement but remaining within the Medium Development category (Figure 5.4).[10] Modest increases in recent years suggests that the city may be experiencing challenges to improving access to and quality of education. Although high school is the highest level of educational attainment of the enrolled population across every *kelurahan* (Figure 5.5)[11], the mean years of formal education in 2020 was 9.9 years, indicating that the average resident has not completed high school.

ACCESS TO EDUCATION

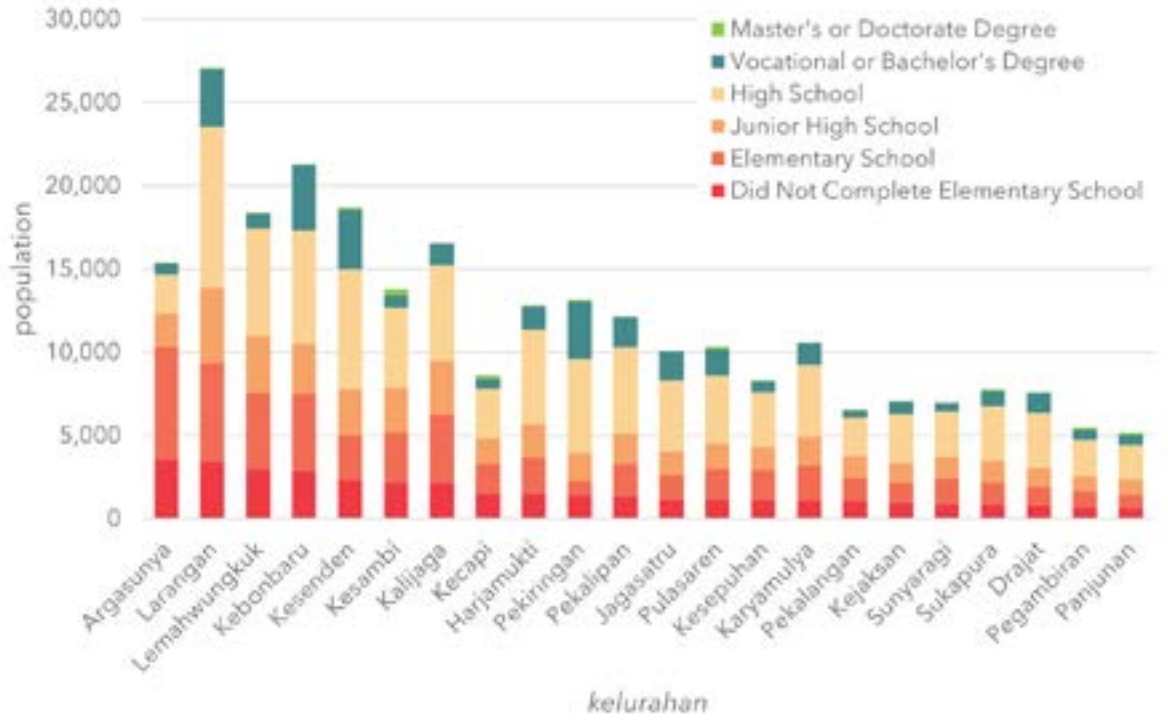
The Government of Indonesia has a 12-year compulsory education system in which every school-age child is required to complete formal secondary education, either on an academic track (SMA)

3. Calculations based on 2020 KOTAKU data.
4. Asia Pacific Observatory on Health Systems and Policies, World Health Organization (WHO). 2017. *The Republic of Indonesia: Health System Review*. New Delhi.
5. Government of Cirebon City. 2019. *Cirebon Satu Data:* Puskesmas, Pustu, Polyclinic, Posyandu, Village Health Post (accessed 10 March 2021).
6. ur-scape. 2021. Cirebon City Database. Future Cities Laboratory. Singapore.
7. Government of Cirebon City. 2020. Official website: "All Assistance to Prevent the Spread of Covid-19 will be well cared for" (accessed 10 March 2021).
8. Statistics Indonesia (BPS): [New Method] Life Expectancy at Birth, 2010-2020 (accessed 10 March 2021). Jakarta.
9. Government of Cirebon City. 2019. *Cirebon Satu Data:* Medical personnel (accessed 10 March 2021).
10. Calculated based on education indicators for expected years of schooling and mean years of schooling from Statistics Indonesia (BPS). *BPS Database:* [New Method] Expected Years of Schooling, 2010-2020; [New Method] Mean Years of Schooling, 2010-2020 using UNDP Human Development Reports technical notes and BPS IPM technical notes (accessed 10 March 2021).
11. Cirebon City Department of Population and Civil Registration. 2020. Education. Cirebon City.



Source: authors

Figure 5.4 Education Index between 2010 and 2020



Source: Cirebon City Department of Population and Civil Registration (2020).

Figure 5.5 Educational attainment levels of enrolled population in 2020

or a vocational track (SMK). Since 2018, Indonesia has also implemented a school zoning system, intended to equally distribute the number of students among schools.[12]

CITYWIDE. Cirebon has several major types of public educational facilities: kindergartens, elementary schools, junior secondary schools, secondary schools, vocational colleges, and universities. To promote school enrollment rates, the government provides school operational assistance grants (BOS) to schools along with cash assistance to school-age children (ages 6-21 years) who come from vulnerable families in the form of Indonesia Smart Cards (KIP).

SLUMS. Across all slum areas, between 78% to 97% of school-age children attend school within the same *kelurahan*, with only Kawasan Pekalipan having a notable share of children attending school in another urban village, perhaps correlated with the area's central location. Between 2% to 10% of school-age children do not attend school, with the highest share of children out of school in Kawasan Kesunean.[13]

Approximately 11% of total slum areas are located beyond a 10-minute walk radius (800 m) of a kindergarten or elementary school (Appendix 4.7), compared to 43% beyond walking distance from a high school (Figure 5.6, Appendix 4.8). Compared to the distribution of *puskesmas* facilities, large areas of Kawasan Argasunya, Panjunan, and Pegambiran are similarly distant from a high school. Kawasan Argasunya has the highest share of area located beyond walking distance of kindergartens, elementary schools, and high schools. Longer travel times to compulsory education facilities may be correlated with lower levels of educational attainment.

QUALITY OF EDUCATION

In addition to the Education Index, proxy measures provide a sense of the quality of education in Cirebon. The high school student-teacher ratio in 2019 was 16.8, higher than the national ratio of 15.2.[14] Disaggregated by track, however, the SMA student-teacher ratio was only 10.3 compared to the SMK ratio of 17.3 in 2019,[15] suggesting that the demand for vocational education in Cirebon may be outpacing the supply of teachers.

To improve public education, the city government has initiated programs to improve "reading culture" and the public library system, aiming to increase public interest in reading by 5% annually.[16] The program establishes local libraries in each *rukun warga* and *kelurahan.* Since the pandemic, the Cirebon City Library and Archives Department (DISPUSIP) has launched digital library services to minimize physical contact.[17]

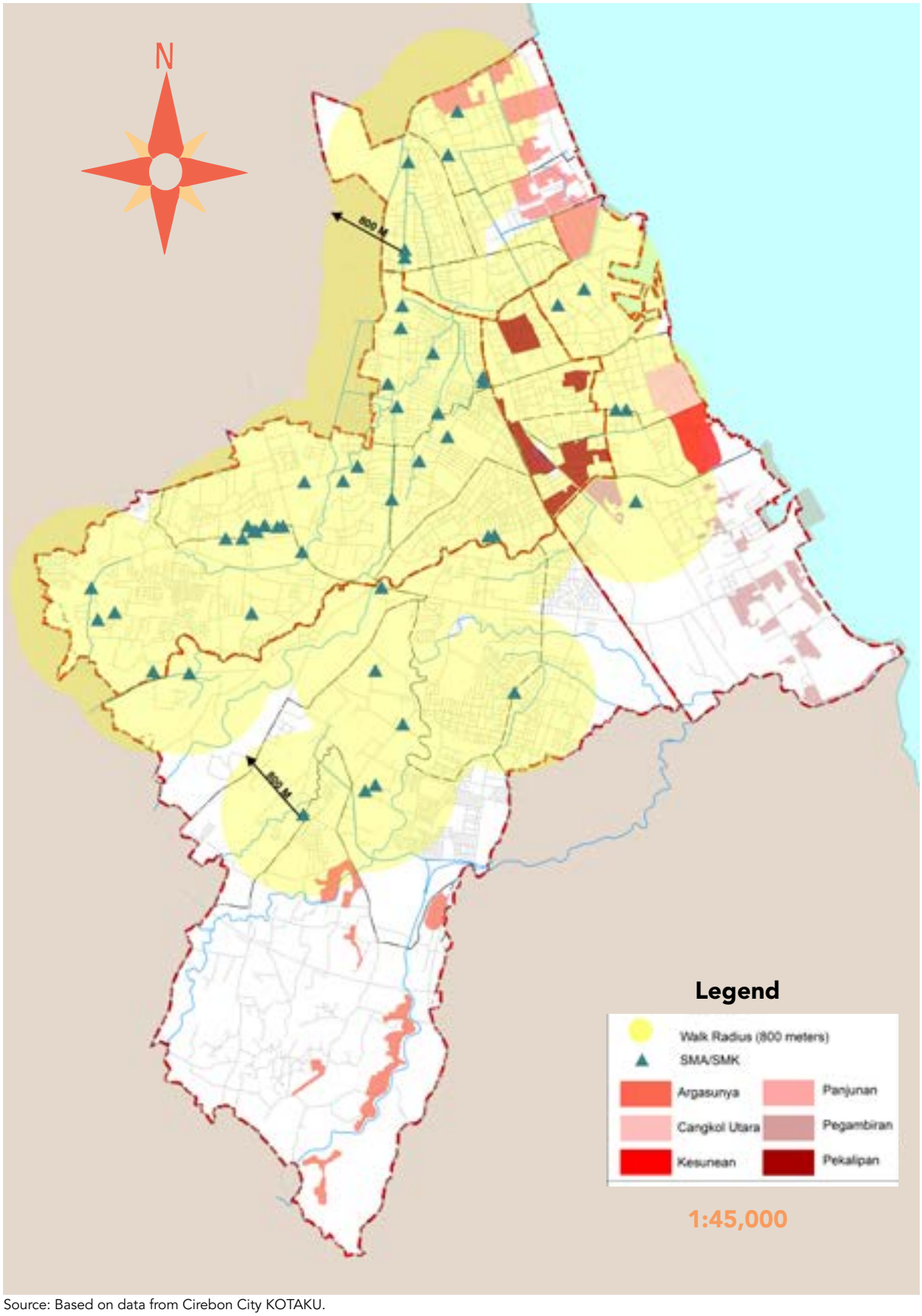
5.3 ENTERPRISE AND LIVELIHOODS

Ninety-one percent of the economically active population were employed in 2019, though Cirebon's unemployment rate was higher than the national urban rate of 6.3%.[18] Men represented 64% of the total number of unemployed. The highest number of job seekers by education level were high school graduates. The city government attributes unemployment rates to: 1) lack of alignment between skills and industry; 2) unskilled workforce that cannot compete in the labor market; and 3) lack of access to labor market information.[19]

For the poor in Cirebon City, the top three livelihoods are: 1) wholesale and retail trade; 2) education, health, social, and civil services; and 3) construction (Figure 5.7).[20] The poor contribute to the top two industries that contribute to Cirebon's GRDP, namely trade and transportation and storage. As of 2019 however, no poor individuals worked in Cirebon's third largest industry, financial and insurance services.

Slum households are primarily employed in trade or services, with between 67% and 100% of households in this sector. Other common types of livelihoods in slum areas are agriculture and forestry as well

12. Government of Indonesia. 2018. Ministerial Regulation *(Permen)* of Education and Culture No.14/2018 on Admission of New Students from Kindergarten to Senior High School/Vocational High School.
13. Calculations based on 2020 KOTAKU data.
14. Government of Cirebon City. 2019. *Cirebon Satu Data:* Number of educators and students (accessed 11 March 2021). Cirebon City. National ratio comes from 2016 BPS data, the latest available.
15. Ibid
16. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) 2018-2023. Cirebon City.
17. Government of Cirebon City. 2020. Official website: "Cirebon City Government Launches Digital Library Service" (accessed 22 January 2021).
18. Statistics Indonesia (BPS) Kota Cirebon. 2019. *Cirebon City in Figures 2020.* Cirebon City.
19. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) 2018-2023. Cirebon City.
20. National Team for the Acceleration of Poverty Reduction (TNP2K). 2015. *Integrated Social Welfare Database (DTKS*): Number of Individuals Working by Employment. Jakarta.



Source: Based on data from Cirebon City KOTAKU.

Figure 5.6 Distance from slum areas to senior high schools, by 10-minute walk radius (800 m).

as construction. Approximately one in five households in Kawasan Panjunan and Pekalipan are employed in agriculture or forestry, while one in five households in Kawasan Cangkol Utara and Pegambiran work in construction. The prevalence of trading among slum and poor populations indicates that any social policy interventions should assess its impacts on this sector.

INFORMAL EMPLOYMENT

Although informal employment and poverty are correlated, comprehensive data are not available to analyze the overlap.[21] At a national level, most informally employed individuals live in urban areas (60%); are men (55%); and are between 40 and 59 years of age (44%). However, half of working women are informally employed compared to only 40% of working men. By age group, 78% of workers ages 65 and older are informally employed compared to only 32% of workers ages 15 to 24.[22] These figures suggest that at a national level, informal employment is more prevalent among women and older populations.

In Cirebon City, 38% of economically active individuals were informally employed in 2019, and of those, most were men (57%).[23] However, by gender, nearly half of working women were informally employed compared to only 38% of working men. Similar to national level trends, informal employment in the city may be more prevalent among women.

Vendor data provide some geographic information on the distribution of informal employment in Cirebon City. In 2020, the city had 1,115 street vendors (PKL) along with 6,487 vendors across 12 traditional markets (*pasar*). However, most street vendors worked in the coastal areas of Kecamatan Lemahwungkuk (30%) and Kecamatan Pekalipan (26%), followed by the highland area of Kecamatan Harjamukti (23%). Market vendors were similarly distributed, with most working at Pasar Kanoman (26%), Pusat Perdagangan Harjamukti (26%), and Pasar Pagi (19%).[24] These data suggest that informal livelihoods may be more prevalent in coastal and highland areas.

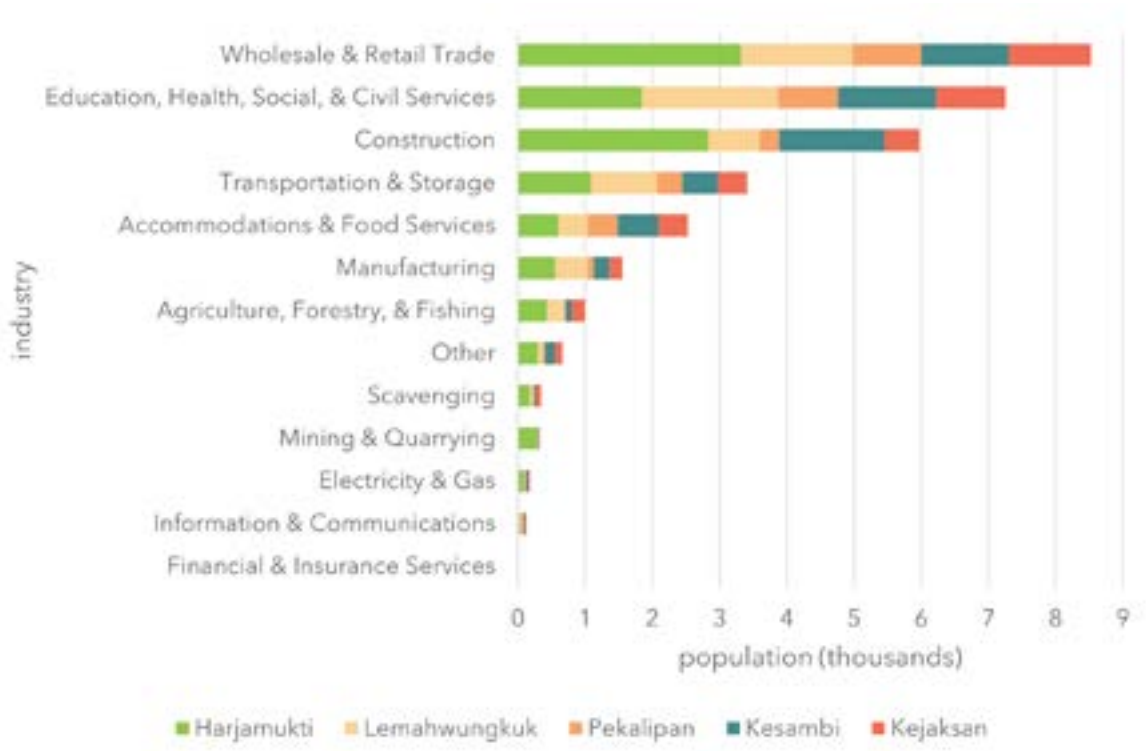
MICRO, SMALL, AND MEDIUM ENTERPRISES

The Department of Industry, Trade, and SME Cooperatives (DPKUKM) is responsible for services for micro, small, and medium enterprises (UMKM) in Cirebon City. [25] In 2020, Cirebon City recorded 2,206 UMKM, most of which were microenterprises (63%); specialized in culinary arts (49%); and were located in Kecamatan Harjamukti (43%).[26] However, these figures likely do not capture the true number of UMKM in the city as already the number of market vendors alone is almost three times larger. Moreover, although a large share of UMKM are likely informal, comprehensive data are not available to analyze the overlap.

The city government sees potential for the economic productivity of UMKM to support tourism. Challenges and opportunities potentially relevant to vulnerable communities include:[27] establishment of a special culinary area in Cirebon City; limited access to capital for UMKM; limited development of Productive Economic Enterprises (UEP, *Usaha Ekonomi Produktif*) or community-based economic activities;[28] limited vending space for street vendors; and poor marketing of creative industries.

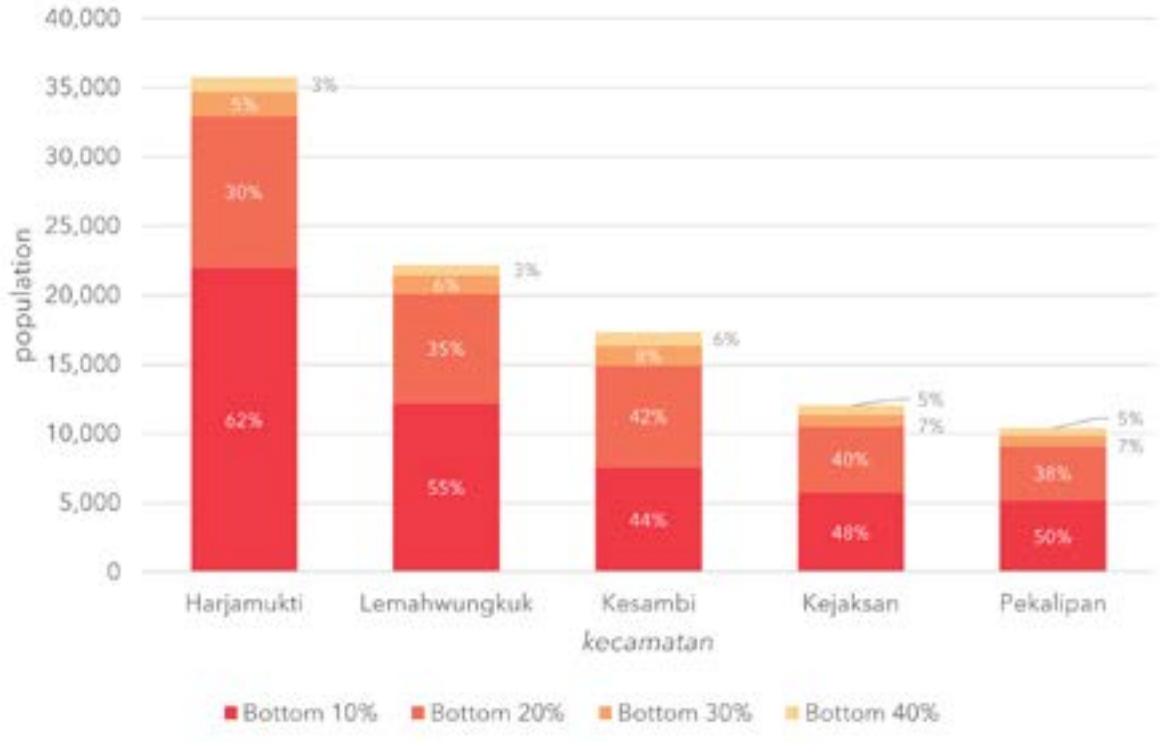
DPKUKM and the Department of Labor both provide livelihood support to UMKM through program activities, including beginner and advanced skills training to support production, packaging, and marketing. Additionally, the Cirebon City Street Vendors Forum (FPKL), an association of street vendors, provides advocacy on behalf of vendors in the city. In 2021, FPKL withdrew from the city government's COVID-19 assistance distribution process, questioning the

21. Asian Development Bank (ADB), Statistics Indonesia (BPS). 2011. *The Informal Sector and Informal Employment in Indonesia*. Jakarta; Association of Southeast Asian Nations (ASEAN). 2019. *Regional Study on Informal Employment Statistics to Support Decent Work Promotion in ASEAN*. Jakarta. Informal employment in Indonesia includes workers with the following employment status: 1) own account workers; 2) employers assisted by temporary workers or unpaid workers; 3) casual workers; and 4) unpaid or contributing family workers.
22. Ibid
23. Government of Cirebon City. 2020. *Cirebon Satu Data:* Number of working women (accessed 30 March 2021).
24. Government of Cirebon City. 2020. *Cirebon Satu Data:* Number of street vendors; Government of Cirebon City. 2020. *Cirebon Satu Data:* Number of traders in traditional markets (accessed 11 March 2021).
25. Statistics Indonesia (BPS) defines UMKM by number of workers: Microenterprise = 0-4; Small Enterprise = 5-19; Medium Enterprise = 20–99; and Large Enterprise = > 99.
26. Government of Cirebon City. 2020. *Cirebon Satu Data:* Micro, Small and Medium Enterprises (UMKM) in the Business Sector (accessed 11 March 2021).
27. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) *2018-2023*. Cirebon City.
28. The objectives of UEP activities are to: 1) increase community empowerment; 2) create jobs and foster an entrepreneurial spirit; 3) develop locally based business activities and opportunities; 4) increase income; and 5) increase food security.



Source: TNP2K (2015).

Figure 5.7 Livelihoods of population in the bottom 40% in 2019



Source: MoSA (2019).

Figure 5.8 Distribution of population in the bottom 40% in 2019

reliability of vendor figures from DPKUKM.[29] However, the FPKL has been supportive of city government plans to construction additional vending shelters and relocate street vendors to these and other locations that conform to local regulations on vending.

5.4 SOCIAL PROTECTION

The Government of Indonesia uses two main databases to target beneficiaries for social protection: 1) Integrated Social Welfare Database (DTKS) from the Ministry of Social Affairs (MoSA), which contains data on the bottom 40% of the national income distribution; and 2) non-DTKS data based on community proposals from the *kelurahan* and *kecamatan* which are then submitted to regional work units (SKPDs) for further evaluation.[30] DTKS information from MoSA is sent to both provincial and city governments to inform targeting of beneficiaries for conditional cash transfers (PKH); non-cash food assistance (Sembako); and temporary unconditional cash transfers (BST) for COVID-19 relief. Non-DTKS information is used to target beneficiaries for other temporary unconditional cash transfers for COVID-19 relief, including from the province (Banprov); city (Bansos Pemkot); and reallocations from the Village Funds Program (*BLT-Dana Desa*).

In 2020, Cirebon City's DTKS included 122,475 individual beneficiaries,[31] or 36% of the total population—four times the number of poor based on the national poverty line alone. Kecamatan Harjamukti had the highest number of poor, with most beneficiaries of social protection located in Kelurahan Argasunya. Kecamatan Lemahwungkuk had the second highest number of poor, with most beneficiaries located in Kelurahan Pegambiran (Figure 2.2). DTKS data from 2019 further show that these two *kecamatan* also had the highest number of Very Poor beneficiaries, or those in the bottom 10% (Figure 5.8). These figures suggest that the national poverty line—which indicates only some 30,000 total poor in 2020—may not capture the true extent of urban poverty.

The Department of Social Services, Women's Empowerment, and Child Protection (DINSOS) oversees the city's social protection services. In response to the COVID-19 pandemic, the city government expanded existing programs and introduced new types of assistance from national, provincial, and local programs. However, the main challenge to distribution has been the targeting of beneficiaries. Cirebon City's DTKS is out of date due to low data verification and validation. As of 2020, the city's DTKS ranked 393rd among all districts and cities and had only improved by 0.12%.[32] The database also has a high number of invalid national identity numbers (NIK), with approximately 10% (9,707) of entries discrepant from the civil registry.[33] Similar to national trends, despite eligibility for multiple forms of assistance, the number of Cirebon beneficiaries receiving more than one type of social protection is low. These data indicate that social protection services in Cirebon City still have much potential for improved accuracy and coverage.

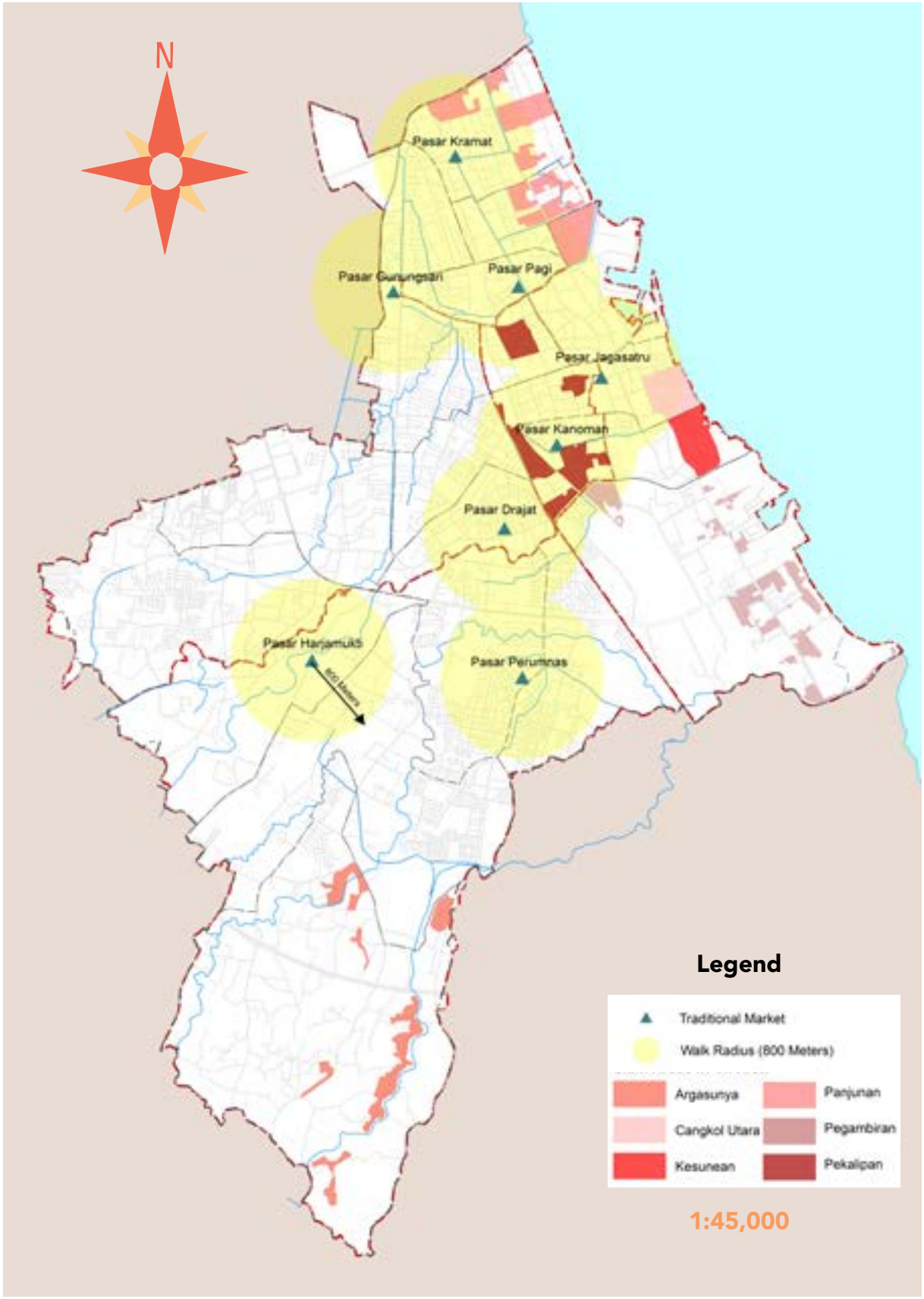
5.5 FOOD SECURITY

The Department of Food, Agriculture, Maritime Affairs, and Fisheries (DPPKP) is responsible for food production, distribution, and security in Cirebon City. Additionally, the city government reinstated the Cirebon City Food Security Council (DKP) in 2017 to implement food diversification policies for increased food security and healthy eating habits.[34] Key programs include sustainable household gardening (KRPL), which distributes seeds to support household level food production; and the Diverse, Nutritious, Balanced and Safe (B2SA) Food Program, which provides information on nutrition and healthy eating.

LOCAL FOOD PRODUCTION

Cirebon City's local food production comes mainly from agriculture and fisheries. In 2018, Cirebon had 175.3 ha of wet and dry food crops across three *kecamatan*, including Lemahwungkuk. Total fish capture in 2017 was 3,342 tons, with activities in Lemahwungkuk contributing roughly 94% (3,132 tons). Marine cultivated aquaculture also produced an additional 204 tons in 2017.[35] Slum areas

29. Fajar Cirebon. 2021. "FPKL Clarification of Supplementary PKL Assistance by DPKUKM Cirebon City" (accessed 11 March 2021).
30. Government of West Java Province. 2021. SOLIDARITAS: "Flow of Providing Social Assistance" (accessed 29 March 2021).
31. Ministry of Social Affairs (MoSA). 2020. "Distribution of the Number of DTKS for October 2020 based on Ministrial Decree of Social Affairs (SK Menteri) No.146/2020" (accessed 11 January 2021).
32. National Team for the Acceleration of Poverty Reduction (TNP2K). 2020. *Update, Analysis, and Utilization of DTKS in Cirebon City.* Jakarta.
33. Ibid
34. Cirebon Kota. 2018. Official website: "Food Security Council Continues to Encourage Diversification of Food Consumption for Cirebon City" (accessed 29 March 2021).



Source: Based on data from Cirebon City KOTAKU.

Figure 5.9 Distance from slum areas to traditional markets (*pasar*), by 10-minute walk radius (800 m)

active in food production include Kawasan Panjunan, where 24% of households are employed in agriculture and fisheries; and Kawasan Pekalipan, where 19% of households are employed in agriculture.[36]

DPPKP has identified agriculture and fisheries as an important sector to develop to improve community welfare. To encourage development of Cirebon's fishing industry, the West Java provincial government has also designated the city as part of the East Gate Regional Development for: 1) agribusiness development supported by the marine and terrestrial fisheries industry, agricultural food crops, forestry, plantations, and animal husbandry in the periphery; 2) development of mangrove forests, seaweed, and pond fisheries; and 3) control of capture fisheries in coastal areas.[37]

However, challenges related to agriculture and fisheries include decreasing area of productive agricultural land due to conversion of agricultural land to non-agricultural land; limited development of organic and hydroponic food plants; limited capital for farmers; underdeveloped food crops, horticulture, and plantations; and lack of management and marketing of marine products.[38]

ACCESS AND AFFORDABILITY

A combination of physical, economic, and institutional factors influence access to food in Cirebon City. In terms of physical access, 8 traditional markets (*pasar*) sell produce and meats as do food stalls within neighborhoods.[39] In 2019, there were also approximately 20 farmers' markets, 19 supermarkets, and 72 minimarkets across five *kecamatan*.[40] However, approximately 72% of total slum areas are not located

35. Statistics Indonesia (BPS) Kota Cirebon. 2017. *Cirebon City in Figures 2018*. Cirebon City.
36. Calculations based on 2020 KOTAKU data.
37. Government of West Java Province. 2010. Local Regulation (*Perda*) No. 22/2010 on Spatial Plan (RTRW) of West Java Province.
38. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) *2018-2023*. Cirebon City.
39. Government of Cirebon City. 2020. *Cirebon Satu Data:* Number of traders in traditional markets (accessed 10 March 2021).

within a 10-minute walk radius (800 m) of a *pasar* (Figure 5.9, Appendix 4.10).[41] As *pasar* are typically the most affordable places to purchase fresh produce outside of household gardening, longer travel times to access food may be correlated with poorer health outcomes.

Despite Cirebon's rapidly growing economy, the city's share of food insecure residents remains high. In 2015, food insecurity in Cirebon was greater than 19%.[42] Kelurahan Argasunya was most vulnerable to food insecurity due to poverty. The average monthly income for heads of household in Argasunya is approximately Rp300.000 per month, or 16% below the city's 2015 poverty line. Moreover, although Argasunya has approximately 250 ha of arable land, most residents only work as informal agricultural laborers, not landowners.

To increase access to available food sources and improve nutrition, in 2020 the city government launched the Green and Sustainable Food Village (KPLH) program in 10 *rukun warga* across four *kecamatan*. The program also supports the production of food by empowering and training community groups to cultivate various types of hydroponic and conventional vegetables and fruits, as well as fish.[43] Heads of food insecure households also receive food aid through Sembako, and individuals can receive assistance through banking products such as business capital for UMKM.

Left: The Sustainable Household Gardening (KRPL) Program aims to increase food security and healthy eating habits in Kelurahan Kesepuhan, Cirebon City.
Top Right: Salted fish lays out to dry.
Bottom Right: Salting fish is a typical home-based enterprise for coastal communities in Kelurahan Kebonbaru, Cirebon City.
Source: Asian Development Bank.

40. Government of Cirebon City. 2019. *Cirebon Satu Data:* Number of farmer groups; Government of Cirebon City. 2019. *Cirebon Satu Data:* Number of modern markets (accessed 10 March 2021).
41. ur-scape. 2021. *Cirebon City Database*. Future Cities Laboratory. Singapore.
42. Republika. 2016. "Food Insecurity in Cirebon City" (accessed 11 January 2021).
43. Cirebon City Department of Food, Agriculture, Maritime Affairs, and Fisheries. 2020. "Monitoring and Evaluation of Green and Sustainable Food Village (KPLH) Activity in Cirebon City" (accessed 11 January 2021).

The mangrove forest in Kelurahan Kasepuhan. Asian Development Bank.

CHAPTER 6

NATURAL CAPITAL: LAND, WATER, AND AIR

Natural capital comprises areas of a city related to environmental stewardship of natural resources, climate change, and disaster risk reduction. The report includes these areas to assess the potential for integrating nature-based solutions into basic infrastructure delivery and supporting capacity building for management of natural resources and disaster risk.

6.1 NATURAL RESOURCES

As an estuarine city, Cirebon City has an abundance of both marine resources and inland waters including rivers and lakes. Although 91% of the city consists of lowlands with 0-3% grade,[1] the southern part of the city quickly ascends into hilly-upland area dominated by peri-urban settlements and cropland. Approximately 30 km southwest of the city is Mount Ciremai, a major stratovolcano that marks the highest point in West Java, reaching 3,078 m (10,098 ft) above sea level.

Management of these natural resources is shared between central, provincial, and city governments. Where applicable, policy frameworks are individually outlined within each section below. At the local level, the Department of Environment (DLH) is the lead agency for natural resource management. To monitor Cirebon City's environmental quality, DLH publishes the Environmental Quality Index (IKLH), an annual, statistic composite index of water quality, air quality, and land cover indicators at the city level.[2] DLH is also responsible for conducting Strategic Environmental Assessments (KLHS)—an analysis of environmental impacts of proposed policies, plans, and programs—prior to issuance of land and forest management permits.[3] As of this writing, DLH expects to finalize its protocols for conducting KLHS in March 2021.[4]

COASTS

Cirebon City's coastline is approximately 7 km long, bordered on the north by the Kedung Pane River, on the south by the Kalijaga River, and on the east by the Java Sea. The coastline, an imaginary boundary that is often politically determined, demarcates local jurisdictional authority from that of the Government of West Java Province. While the city's General Spatial Plan (RTRW) governs urban development up to the coastline, the provincial government's Zoning Plan for Coastal Areas and Small Islands (RZWP3K) governs spatial planning up to 12 nautical miles (nm) beyond.[5] The city government has the option to manage its coastal resources with approval from the provincial government.

The biodiversity of the coastal and estuarine area includes mangrove forests, crustaceans, and fish. Common species include Acetes shrimp (*udang rebon*), blue swimmer crab (*rajungan*), Asian sea bass (*baramundi*), grouper (*kerapu*), croaker (*gelama*), mahogany snapper (*ngangas*), and spotted scat (*kiper*). A tidal range of 0.7 m,[6] with two daily high tides and two daily low tides, support the flora and fauna.

Human activity along the coast includes tourism, fishing, and cultural activities. Kejawanan Beach (*Pantai Kejawanan*), the city's most popular beach, features a fish market

1. ur-scape. 2021. *Cirebon City Database*. Future Cities Laboratory. Singapore.
2. Ministry of Environment and Forestry (MoEF). 2019. *Environmental Quality Index (IKLH) 2019*. Jakarta.
3. Government of Indonesia. 2016. Government Regulation (PP) No.46/2016 on Implementation Procedure for The Strategic Environmental Assessment.
4. Interview with DLH. 18 March 2021.
5. Government of West Java Province. 2019. Local Regulation (*Perda)* No. 5/2019 on West Java Province Zoning Plan for Coastal Areas and Small Islands (RZWP3K) 2019-2039. Past the territorial sea (12 nm), the central government has jurisdiction over Indonesia's exclusive economic zone.
6. Calculations based on Cirebon City Department of Public Works and Spatial Planning. 2011. *Drainage Master Plan*. Cirebon City.

in addition to boat rentals. According to local folklore, the water and mud here have medicinal properties capable of healing diseases and improving skin conditions.[7]

However, natural and man-made changes to the coastal area over the past 25 years have impacted the marine ecosystem and biodiversity. High levels of natural sedimentation have increased city land area by approximately 79 ha.[8] Moreover, between 2009 and 2019, coastal erosion reduced the region's coastal area by an estimated 107 ha, while coastal accretion increased it by an estimated 941 ha.[9] Land reclamation activities from the planned port development and unregulated slum development have further altered the coastline (detailed in Chapters 2 and 3).

MANGROVE FORESTS

Two mangrove species grow along the Cirebon coast: grey or white mangrove (*Avicennia marina*) in Kelurahan Kasepuhan and Pegambiran; and red mangrove (*Rhizopora mucronota*) in Kelurahan Kesenden and Kebonbaru.[10] Between 2015 and 2016, mangrove forest area along the Cirebon City coastline decreased from 11.5 ha to only 4.5 ha.[11] Approximately three hectares of mangroves are in the Kelurahan Kasepuhan coastal slum area. In recent years, the local government has supported mangrove restoration efforts.

Although DLH oversees mangrove management in the city, in 2014, the agency transferred responsibility for operations and maintenance of the mangroves in Kelurahan Kasepuhan to residents of *rukun warga* RW09.[12] To prevent coastal erosion and reduce the force of waves, the residents formed a mangrove working group in 2018 that partnered with DLH to plant 3,000 mangrove trees. The RW09 Mangroves Working Group prohibits construction of buildings and damage to mangroves within the Kelurahan Kasepuhan area. RW09 residents credit the mangroves for protecting their aquaculture ponds, thereby increasing their incomes and for increasing the catch of shrimp and crab in the mangrove area.[13] Batik craftspeople in RW09 also use mangroves to extract natural dyes.

RIVERS

Cirebon has four main river systems that drain to the Java Sea: Kedung Pane River, Sukalila River, Kesunean (Kriyan) River, and Kalijaga River. These rivers constitute the city's primary drainage system and are classified as Class IV, used for agriculture, irrigation, and fisheries.[14]

River basin management in Cirebon City is the responsibility of the Cimanuk-Cisanggarung Greater Basin Territory Center (BBWS), a regional authority with national status under the Directorate General of Water Resources (*Ditjen Sumber Daya Air*) in MPWH. Setbacks, imaginary boundaries along each riverbank determined through negotiation, delineate jurisdictional authority between the city government and BBWS. The city's RTRW governs urban development up to these setbacks, after which BBWS's dual planning documents, the River Basin Management Strategic Plan and Master Plan (*Pola dan Rencana Pengelolaan Sumber Daya Air Wilayah Sungai*), control the river basin. As of 2015 however, the 2010 *Pola* was under review and the *Rencana* was in progress.

DLH is responsible for the water quality of the city's rivers. In 2019, DLH rated the city's water quality as 57 on the Water Quality Index,[15] a modest improvement from the constant rating of 50 between 2014 and 2016 (Figure 2.4). Water quality however remains Very Poor.[16] The household waste generated by increasing numbers of informal settlements along the riverbanks has likely contributed to the decline of watershed.[17]

7. Interviews with Cirebon City Department of Youth, Sports, Culture, and Tourism (DKOKP). 26-28 February 2020.
8. Noorrahmah et al. 2014. *Opportunities and Challenges of Land Reclamation in Cirebon City (Tanah Timbul di Kota Cirebon Peluang dan Tantangan)*. Bandung.
9. Khadijah et al. 2020. *Coastline Changes On the Coast of Cirebon Using Landsat*. Depok.
10. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3, Cirebon City*. Manila.
11. Cirebon City Department of Environment. 2018. *Regional Environmental Management Performance Information Report for 2017. Cirebon City.*
12. Interviews with DLH. 26-28 February 2020.
13. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3, Cirebon City*. Manila.
14. Cirebon City Department of Environment. 2018. *Regional Environmental Management Performance Information Report for 2017*. Cirebon City.
15. At national level, the Water Quality Index consists of ten parameters: pH, BOD, COD, TSS, TDS, total phosphate, DO, fecal coli, NH3, and NO3. 13 sampling points representing three main rivers. However, the Environmental Agency only uses seven indicators to measure it, namely TSS, DO, BOD, COD, total phosphate, fecal coli, and total coli.
16. Cirebon City Department of Environment. 2019. *Cirebon City Environmental Quality Index 2019*. Cirebon City. Excellent = ≥90; Very Good = 82-89; Good = 74-81; Satisfactory = 66-73; Poor = 58-65; Very Poor = 50-57; Dangerous = <50.
17. Cirebon City Department of Housing and Settlements. 2017. *Slum Prevention and Quality Improvement Plan* (RP2KPKP). Cirebon City.

To manage water quality, the city government has strengthened regulations on PERUMDAM Tirta Giri Nata's water utility services and rates, environmental protection and management, and licensing for wastewater disposal.[18] It has also initiated several water management programs, including the Clean River Water Program (*Program Air Sungai Bersih*); Community-Based Sanitation (*Sanitasi Total Berbasis Masyarakat*); Clean Small River Program (*Program Kali Bersih*); and rainwater harvesting.

AIR QUALITY

DLH is also responsible for the city's air quality. Cirebon's Air Quality Index has noticeably declined from 90.0 (Good) in 2014, to 68.6 (Poor) in 2019 (Figure 2.4).[19] Two major sources of air pollution in Cirebon are: 1) fuel combustion from motorized vehicles; and 2) coal loading and unloading activities at the Port of Cirebon. Because the Port of Cirebon is part of the coal supply chain for West and Central Java, the city plays key roles as industry regulator and operator in both provinces.[20] Despite reduced vehicular traffic due to COVID-19 social distancing orders, the air quality in Cirebon City has remained relatively constant. As of April 2020, air quality monitoring showed an index of 78.[21]

To manage air quality, the city government has strengthened regulations on traffic management, traffic impact analysis, and environmental protection and management.[22] It has also initiated several air quality management programs, including a Clean Air Program (*Program Udara Bersih*), a Low Sulfur Fuel Oil Program (*Bahan Bakar Minyak*); and tree planting.

6.2 CLIMATE, TEMPERATURE, AND NATURAL HAZARDS

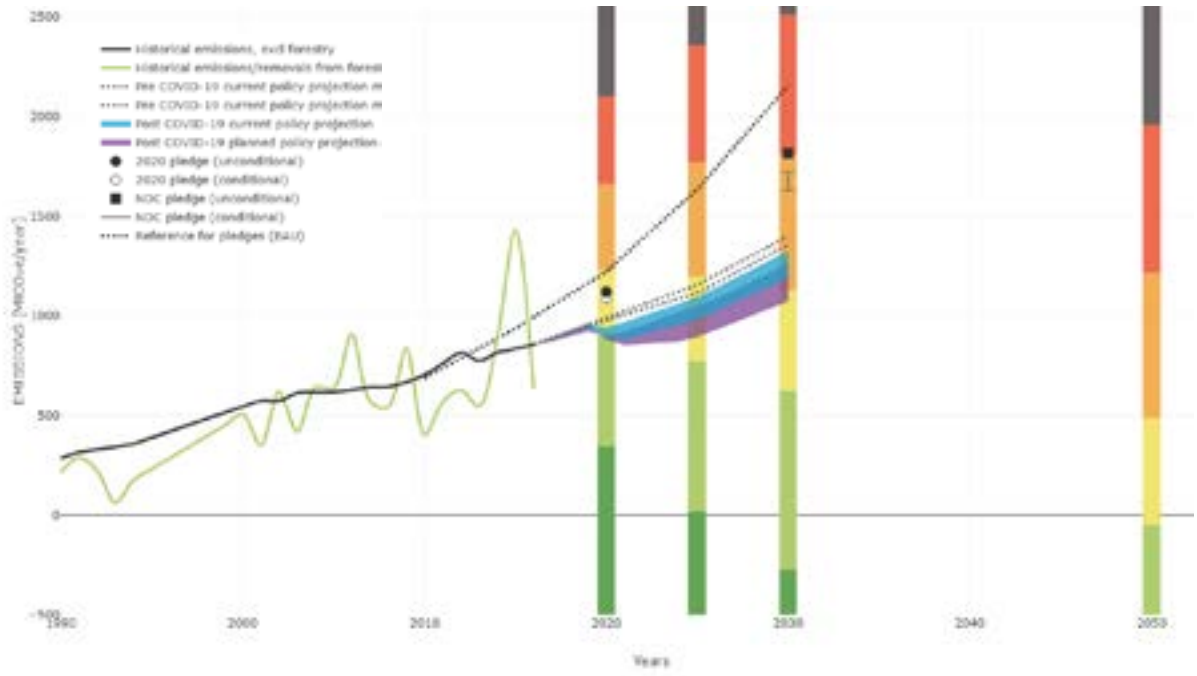
Cirebon City has a tropical monsoon climate with a narrow seasonal temperature range and distinct heavy rainfall season. Generally, average air temperature ranges from 22.3°C to 33.0°C, though humidity varies between 48% and 93%.[23] Average annual rainfall is 2,260 mm per year, with approximately 155 days of rain. Rainy season falls between October and April, while dry season falls between June and September.

The El Niño Southern Oscillation (ENSO), especially in October and November, is strongly correlated with variations in monsoon rainfall amounts.[24] During El Niño, risk of drought, low river flows, drier conditions in savannah and cropped areas, and regional forest fires increases. Storm surge and high tides are significantly lower during El Niño phases but higher during strong La Niña episodes [25] Heatwave frequency and severity are also positively correlated with ENSO in winter.[26] Cirebon is classified as at medium risk from storm surges, when combined with a sea level rise of 0.06 m and subsidence of 1.0 m.[27]

The frequency of natural hazards has increased in direct proportion to the destruction of forests in upstream areas, such as Mount Ciremai, and the reduction in permeable land. Between 2000 and 2010, the Cirebon metropolitan area recorded 45 major natural disasters. In the last ten years however, it has recorded 148 events, including floods, tornadoes, landslides, droughts, and wildfires.[28] Floods have occurred most frequently, at a total of 65 times in the last ten years. In 2019 alone, the Cirebon metropolitan area experienced 38 natural disasters in which 4,200 homes were flooded, 260 ha of crops were damaged, 200 people were relocated, and 118,000 people were affected.[29]

Coastal slum areas are particularly disaster-prone as they are at once located in a seismic zone and vulnerable to

18. Government of Cirebon City. 2017. Local Regulation *(Perda)* No. 17/2017 on PERUMDAM Tirta Giri Nata Service; Government of Cirebon City. 2004. Mayoral Regulation *(Perwal)* No. 04/2004; Government of Cirebon City. 2015. Local Regulation *(Perda)* No. 05/2015 on Protection and Management of the Environment; Government of Cirebon City. 2012. Mayoral Regulation (*Perwal)* No. 39/2012 on Permission for Wastewater Disposal to Water or Water Sources.
19. Cirebon City Department of Environment. 2019. *Cirebon City Environmental Quality Index 2019*. Cirebon City.
20. European Union. 2020. *Urban Analysis Report 2020: Cirebon*. Jakarta.
21. Radar Cirebon. 2020. "Air visual conducted using PM 2.5 parameter aligned with US AQI (air quality index) standard" (accessed 12 March 2021).
22. Cirebon City Department of Environment. 2018. *Regional Environmental Management Performance Information Report for 2017*. Cirebon City.
23. Cirebon City Department of Housing and Settlements. 2017. *Slum Prevention and Quality Improvement Plan* (RP2KPKP). Cirebon City.
24. World Bank. Climate Change Knowledge Portal; NOAA Physical Sciences Laboratory (accessed 20 April 2021).
25. Muis et al. 2018. Influence of El Niño-Southern Oscillation on global coastal flooding. *Earth's Future,* 6, 1311-1322.
26. Li, X.X. 2020. "Heat wave trends in Southeast Asia during 1979–2018: The impact of humidity." *Science of The Total Environment*, 721, 137664.
27. Willemsen et al. 2020. *Risk Assessment North Coast Java*. Delft.
28. Government of Indonesia. *Indonesia Disaster Data and Information* (DIBI) (accessed 13 November 2020). Jakarta.
29. Ibid.



Source: Climate Action Tracker (2020).

Figure 6.1 Country summary of Indonesia's climate pledges with current policy projections

tidal inundation. Approximately 61% of total slum area is vulnerable to 2 m of sea level rise.[30] Kawasan Cangkol Utara, for example, regularly experiences flooding whenever there is a combination of high tide and heavy rain. Flooding in the southern part of the slum area typically exceeds 30 cm and lasts for one to two hours.[31]

Based on current climate variability, the weather-related risks to Cirebon City are from:[32]

- surface water (pluvial) flooding during high-intensity rainfall events;
- coastal flooding by high tides, exacerbated by coincident pluvial flooding;
- pollution by overflowing open drains, latrines and septic tanks during floods;
- groundwater contamination by foul water during floods;
- waterborne disease following flood episodes and heatwaves;
- salinization of groundwater systems by rising sea levels and/or drawdown (in land);
- intermittent water supply and variable quality during droughts (El Niño episodes);
- fatalities, blackouts, and structural damage to buildings due to tornados; and
- heatwaves and intense urban heat island episodes.

6.3 CLIMATE CHANGE

POLICY AND PLANNING FRAMEWORK

The Government of Indonesia ratified the Paris Agreement in 2016.[33] Its current Nationally Determined Contribution (NDC) pledges to reduce emissions by 29% independently or by 41% with international assistance by 2030.[34] In 2020, Indonesia opted to maintain its original NDC pledge instead of setting more ambitious targets for 2030. Researchers at Climate Action Tracker have rated Indonesia's NDC as Highly Insufficient. As it falls outside of the "fair share" range and is not consistent with holding global warming below 2°C, let alone 1.5°C (Figure 6.1).[35]

30. ur-scape. 2021. *Cirebon City Database*. Future Cities Laboratory. Singapore.
31. Cities Development Initiative for Asia (CDIA). 2019. *Pre-Feasibility Study of the Slum Improvement in Strategic Human Settlements Area Project: Volume 3 - Cirebon City*. Manila.
32. Willemsen et al. 2020. *Risk Assessment North Coast Java*. Delft.
33. Government of Indonesia. 2016. Law (UU) No. 16/2016 on Ratification of the Paris Agreement to the United Nations Framework Convention on Climate Change. Jakarta.
34. Independently refers to the "unconditional contribution," what countries could implement without any conditions and based on their own resources and capabilities. International assistance refers to the "conditional contribution," what countries could undertake if international means of support are provided.

Source: Climate Central (2015).

Figure 6.2 Land vulnerable to 2 m of sea level rise and local annual flooding in Cirebon City by 2030

CLIMATE MITIGATION. The National Action Plan for Reducing Greenhouse Gas Emissions (RAN-GRK) outlines emissions targets in five priority sectors: forestry and peatlands; agriculture; energy and transportation; industry; and management.[36]

In 2017, the Ministry of National Development Planning (BAPPENAS) launched the Low Carbon Development Initiative (LCDI), a multistakeholder coordination process that aims to incorporate greenhouse gas (GHG) emissions reduction targets, along with other interventions for preserving and restoring natural resources, into policy planning. BAPPENAS organizes LCDI and coordinates between government ministries, the international donor community, local and international partners, experts, and civil society.

CLIMATE ADAPTATION. The National Action Plan for Climate Change Adaptation (RAN-API) outlines a national adaptation strategy that focuses on increasing resilience in five target areas: economy; livelihoods; environmental services; special areas, including cities; and capacity building.[37]

In 2019, BAPPENAS released a LCDI report that provides alternative development scenarios to support Indonesia's economic growth toward a low carbon economy.[38] While focused largely on climate mitigation, the report also identifies climate risks and urges for climate adaptation to increase resilience.

Although climate change and its impacts are one of the Cirebon City's top priorities for the period 2018-2023,[39] the city has no local climate policies. Rather, city agencies are responsible for implementing climate policies from central and provincial governments.

INSTITUTIONAL ARRANGEMENTS

At the national level, the Ministry of Environment and Forestry (MoEF) is the lead ministry responsible for climate policy. Six-line ministries share responsibility, including MoEF, Ministry of Agriculture (MoA), Ministry of Energy and Mineral Resources (MoEMR), Ministry of Industry (MoI), Ministry

35. Climate Action Tracker (CAT). "Indonesia country summary" (accessed 12 March 2021).
36. Government of Indonesia. 2012. *National Action Plan for Reducing Greenhouse Gas Emissions* (RAN-GRK). Jakarta.
37. Government of Indonesia. 2012. *National Action Plan for Climate Change Adaptation* (RAN-API). Jakarta.
38. Government of Indonesia. 2019. *Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia.* Jakarta.
39. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) 2018-2023. Cirebon City.

of Transportation (MoT), and MPWH.[40] The Ministry of Finance (MoF) also uses a Climate Change Budget Tracking tool to map public financing for activities related to climate change.

At the subnational level, climate policy implementation is facilitated by the Java-Bali-Nusa Tenggara Center for Climate Change and Forest & Land Fires (BPPIKHL *Wilayah Jawa, Bali, Nusa Tenggara*), a regional authority with national status under MoEF. The center is responsible for regional policy planning, capacity building, and technical guidance on mitigation, adaptation, and prevention. In Cirebon City itself, the lead agency responsible for climate policy is DLH. DLH is supported by several other city agencies: DPUPR, PERKIM, DISHUB, and DPPKP.[41]

CLIMATE CHANGE RISK

The northern coast of Java is considered at risk due to a combination of exposure and vulnerability factors. More than 1,000 people per sq km live less than 10 m above sea level,[42] with 57% percent of the city population living in highly exposed areas. In 2009, the Cirebon metropolitan region ranked as the fourth most vulnerable city to coastal inundation in East Asia and Pacific.[43] Approximately 1,100 ha of land is vulnerable to flooding due to increased rainfall and sea level rise.[44] Based on a Climate Change Vulnerability Index, 13 of Cirebon's 22 *kelurahan* are vulnerable as of 2020.[45]

FUTURE PROJECTIONS

Indonesia is widely recognized as a climate change hotspot of extreme seasonal precipitation and temperature change.[46] However, evaluation of specific climate change impacts for Cirebon City is limited by lack of available data, especially for sea level rise projections. Climate Central's Surging Seas sea level rise and coastal flood maps do provide some data visualizations for projections between 2030 and 2100 (Figure 6.2).

CDIA has identified two kinds of impacts from climate change: 1) shocks or sudden impacts due to storms and heat waves; 2) stressors or impacts that build gradually over time from sea level rise, temperature increase, and long-term changes in rainfall patterns.[47] Natural climate variability will continue to be the dominant driver of weather-related impacts over the near-term horizon of the 2030s, though perhaps the most confident projection for the next few decades is of more frequent and severe humid heat episodes (Appendix 3).[48] More generally, wet season droughts and temperature extremes associated with El Niño and flooding under La Niña are expected to amplify.[49] Potential indirect impacts could include: interruptions to port or train operations, travel to work, and transport of goods during floods; blackouts as energy systems are affected by storms and surges in electricity demand during heatwaves; increased risk of water- or vector-borne diseases due to floods and higher temperatures; and increased pressure on healthcare systems and critical infrastructure during heatwaves, exacerbated by poor air quality from forest fires and pollution in the wider region. In slum areas, inadequate urban infrastructure—particularly sanitation, drainage, and solid waste management—may exacerbate climate impacts. Increased frequency and intensity of flooding may mean increased exposure to contaminated water.

DEVELOPMENT PLANS

Vulnerabilities identified by the city government include: 1) no disaster risk reduction plan; 2) limited number of facilities for disaster management; 3) lack of an early detection system for hazards; and 4) limited human resources trained in disaster management.[50] The city government has a two-fold strategy to increase

40. Ministry of Finance (MoF). 2018. *Climate Change Financing Policy and Climate Change Adaptation Budget Designation Process Presentation*. Climate Change Adaptation NDC Elaboration Workshop in Jakarta on 17 January 2018.
41. Priyadi et al. 2020. *Urban Analysis Report 2020: Cirebon*. Jakarta.
42. Columbia University. 2007. "Western Indonesia: Population Density within and outside of a 10m Low Elevation Coastal Zone" CIESIN (accessed 12 March 2021).
43. Dasgupta et al. 2009. "Climate change and the future impacts of storm-surge disasters in developing countries." *Center for Global Development Working Paper*, 182.
44. Pratiwi et al. 2016. *Mainstreaming gender in climate change adaptation: A case study from Cirebon, Indonesia. Asian Cities Climate Resilience*. London.
45. Priyadi et al. 2020. *Urban Analysis Report 2020: Cirebon*. Jakarta. Vulnerability to climate change is determined by indicators that affect the system's exposure, sensitivity, and adaptive capacity. These factors change over time as development activities and adaptation efforts take place.
46. Diffenbaugh et al. 2012. Climate change hotspots in the CMIP5 global climate model ensemble. *Climatic Change*, 114, 813-822.
47. Ibid
48. Raymond et al. 2020. The emergence of heat and humidity too severe for human tolerance. *Science Advances*, 6, eaaw1838.
49. King et al. 2016. Climate change and El Niño increase likelihood of Indonesian heat and drought. *Bulletin of the American Meteorological Society*, 97, S113-S117.
50. Government of Cirebon City. 2018. *Regional Medium-Term Development Plan* (RPJMD) *2018-2023*. Cirebon City.

disaster and climate resilience. First, the city plans to improve environmental quality through biodiversity and conservation of natural resources, with policies to improve water quality and supply, air quality, and spatial planning as well as increase vegetation cover. Second, to manage climate change impacts, it plans to reduce greenhouse gas emissions and increase climate adaptation through provision of public facilities, infrastructure, and livable dwellings; improvement of housing, settlements, and environments; and reduction in urban slum areas.

A few climate-related initiatives are in progress. Two community units, RW09 Kesunean Selatan and RW07 Pulo Baru Selatan, are piloting the national Climate Village Program (*Program Kampung Iklim*). [51] The city is also experimenting with alternative flood management using biopore infiltration holes (LRB)[52] as well as using a Green Area Ratio (KDH), a zoning regulation that sets standards for site design to help reduce stormwater runoff.[53]

6.4 DISASTER RISK MANAGEMENT

The Regional Board for Disaster Management (BPBD) is responsible for disaster risk management in Cirebon City. An emergency telephone number (NTPD) 112 connects callers to emergency response agencies, including for natural hazards. The city government has designated several facilities as city level disaster evacuation sites: Bima Stadium and Kebon Pelok Field for flooding; and the Kejaksan Main Square *(Alun-Alun Kejaksan)* for tsunamis.[54]

Disaster risk management priorities include: 1) strengthening policies and institutions; 2) risk assessment and integrated planning; 3) development of information systems, training, and logistics; 4) management of disaster-prone areas; 5) increasing the effectiveness of disaster prevention and mitigation; 6) strengthening disaster emergency preparedness and management; and 7) development of a disaster recovery system.[55] Furthermore, regional disaster risk management plans and regulations are also in progress as of 2020 although their status is unclear.

51. ProKlim is a national program developed by MoEF to encourage active participation of all parties in carrying out local actions to increase resilience to the impacts of climate change and reduction of greenhouse gas (GHG) emissions.
52. Cirebon City Department of Environment. 2017. *Regional Environmental Management Performance Information Report for 2017*. Cirebon City.
53. Government of Cirebon City. 2016. Local Regulation (*Perda*) No.4/2016 on Buildings.
54. Government of Cirebon City. 2012. Local Regulation (*Perda*) No. 8/2012 on Cirebon Spatial Plan (RTRW) 2011-2031.
55. National Board for Disaster Management (BNPB). 2014. "Disaster Risk Index Trend and Policy Recommendations for Cirebon City" (accessed 12 January 2021).

The Red Mosque of Panjunan (*Masjid Merah Panjunan*) in Kelurahan Panjunan is one of the oldest mosques in Indonesia. Asian Development Bank.

CHAPTER 7

SOCIAL CAPITAL: GOVERNANCE AND COMMUNITY

Social capital comprises non-physical assets related to cultural identity, inclusion, and community development. The report differentiates between human capital, or areas that increase individual opportunity, and social capital, or areas that increase group cohesion. The report includes these areas to assess the potential for building capacity of local institutions and citizen engagement among slum communities and the urban poor.

7.1 CULTURAL HERITAGE

Modern-day Cirebon is thought to have begun in the mid-15th century as a fishing port called Muara Jati, which was part of the Sunda Kingdom in West Java. Its independence shortly after is credited to Sunan Gunung Jati, founder of the Islamic Sultanate of Cirebon and one of the nine revered saints (*Wali Songo*).[1]

Throughout the 16th and 17th centuries, the Cirebon sultanate was a major center of trade and commerce, bringing a diverse mix of migrants from various cultures including Sundanese, Javanese, Chinese, and Arab. These cultural influences are still evident in modern-day Cirebon's language and customs. The sultanate later split into four separate lines of royal succession, evidenced today by the four historic palaces (*keraton*) that still stand: Keraton Kasepuhan, Keraton Kanoman, Keraton Keprabonan, and Keraton Kacirebonan.

CIREBONESE IDENTITY

CITYWIDE. The tradition of royalty has made Cirebon City rich in creative sectors such as performing arts, architecture, art markets, and culinary arts. Local art forms include the Cirebonese mask dance (*tari topeng Cirebon*), shadow puppetry (*wayang kulit*), and tarling music. Cirebon is also one of four major industrial centers in West Java for batik fabric and is known for its iconic megamendung motif. Beyond the four keraton, key heritage sites include the Tomb of Sunan Gunung Jati and Sunyaragi Cave. While the city's form of governance is no longer a sultanate, descendants of Cirebon's royal lineage (*Elang*) are still recognized by the government,[2] and city residents who follow tradition (*adat*) still hold royals in high regard.

SLUMS. Cultural heritage in slum areas is diverse. In coastal areas, culture is influenced by seafaring traditions. Fishing communities still practice the Sea Alms tradition (*Nadran*), a ritual whereby offerings of food (*ancak*) are made to marine animals as prayers for their abundance. The livelihoods of these communities, including salting fish, fermenting shrimp into shrimp paste, and trading at fish auctions, are highly interconnected with marine resources.

Other neighborhoods have strong regional influences. Kelurahan Panjunan is the center of Arab culture in Cirebon City. Livelihood activities such as selling prayer beads, incense (*mengan*), tobacco, holy water (*zam-zam*), and Middle Eastern foods are typically found in this Arab village. In areas with Chinese influence, residents hold ceremonies in neighborhood temples to welcome the Chinese New Year. To celebrate, these communities make Year Cake (*dodol cina*), a sticky sweet cake thought to bring good fortune.

Religion, particularly Islam, also heavily influences much of Cirebon City. In Kampung Benda, a village in Kelurahan Argasunya that adheres strictly to Islamic law, modern technologies such as electronics are not allowed as they are considered

1. Bowring, P. 2019. *Empire of the Winds: The Global Role of Asia's Great Archipelago*. p 159.
2. *Elang* is a title that indicates a person has descended from the Cirebon sultanate.

Source: Cirebon City BPS (2018).

Figure 7.1 Gender Development and Empowerment in Cirebon City between 2010 and 2018. [a]No data available

negative influences on the community's customs and traditions. In areas around the Great Mosque of Cirebon (*Masjid Agung Sang Cipta Rasa*), which has a historic role in the city's development, residents celebrate *Muludan* to commemorate the birthday of the Islamic prophet Muhammad. A nearly week-long festival takes place, culminating in a traditional ritual where all the palace heirlooms are cleansed and paraded through the four *keraton*.

7.2 SOCIAL INCLUSION

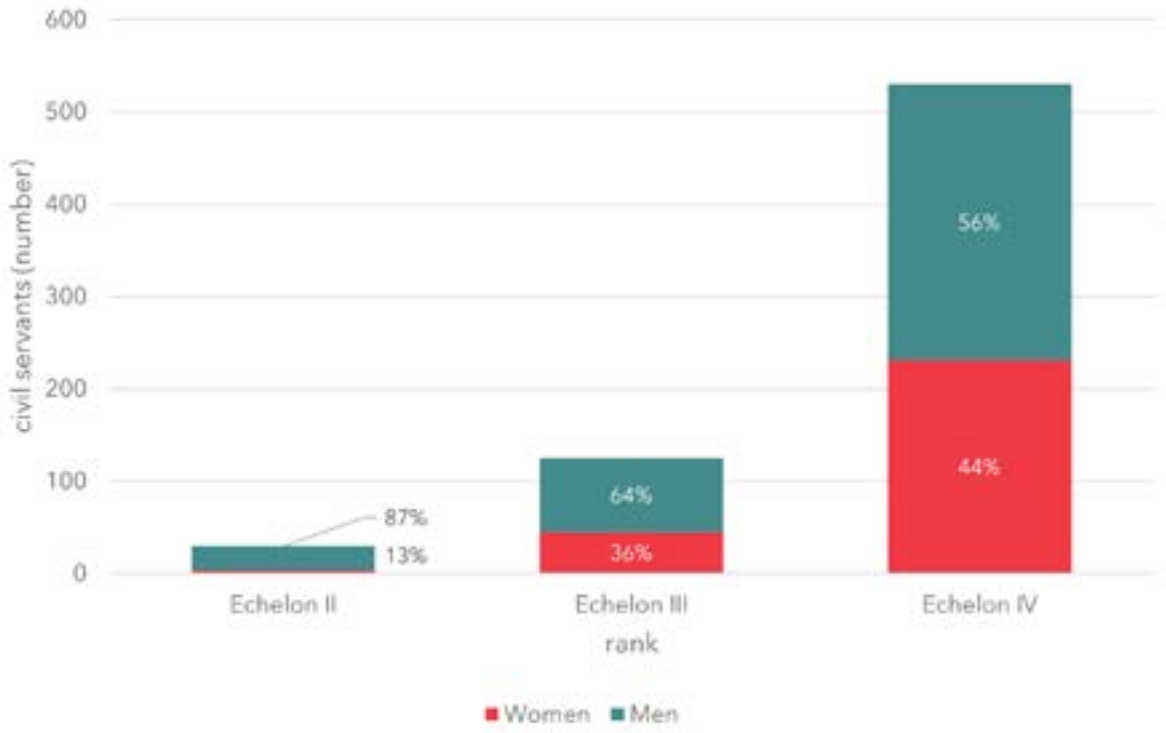
GENDER

Gender in Cirebon City is complex. Islamic teaching, central to much of the city's history and identity, also influences societal norms for gender roles and tends to place women in the private sphere instead of public life. While the city's Gender Development Index (IPG) between 2010 and 2018 remained high (93.9), its Gender Empowerment Index (IDG) has lagged, peaking in 2015 at 74.9 and declining slightly to 74.0 in 2018 (Figure 7.1).[3] These figures suggest that while gender equality in health, education, and command over economic resources is high, the empowerment of women in economic and political decision-making is still underdeveloped despite significant improvement since 2010.

These inequalities are most visible in politics. In 2017, only 29% of the city's legislators were women,[4] and in 2019, the figure remained unchanged.[5] Although approximately 40% of civil servants between 2018 and 2020 were women, female representation decreases rapidly in executive roles.[6] In 2020, only 13% of civil servants in the highest city rank, Echelon II, were women (Figure 7.2).

In the labor force, women are also underrepresented. Female labor force participation was 46% compared to 80% for men in 2019, largely due to high numbers of female homemakers.[7] Of the women who were employed, nearly half were informal workers, compared to only 38% of working men. Not only is informal employment more common among women

3. Statistics Indonesia (BPS) Kota Cirebon. Gender (accessed 16 March 2021). The Gender Development Index (IPG) measures gender inequalities in achievement in three basic dimensions of human development: health, education, and command over economic resources. The Gender Empowerment Index (IDG) measures whether women have active roles in economic and political life.
4. Statistics Indonesia (BPS) Kota Cirebon. 2017. *Cirebon City in Figures 2018.* Cirebon City.
5. Ibid.
6. Government of Cirebon City. 2020. *Cirebon Satu Data*: Number of civil servants based on echelon (accessed 16 March 2021).



Source: Government of Cirebon City (2020).

Figure 7.2 Number of civil servants by rank and gender in 2020

(detailed in Chapter 5), but gender roles may also strongly influence women's empowerment in Cirebon City.

Poverty among women also has age dimensions. Based on 2019 data, nearly one in four poor households were female-headed (24%), with most female heads-of-household 60 years or older (Figure 7.3). These data suggest that policies and programs to address gender-related issues in Cirebon City may also need to consider age.

To improve gender equality in Cirebon City, the city government ratified gender mainstreaming (PUG) policies in 2018.[8] These regulations provide guidance on institutional strengthening as well as program development, implementation, and evaluation for gender responsive policies and programs. The city government also formed a working group to oversee implementation of PUG, chaired by the mayor and including all agency directors as members. Action plans include PUG in policymaking processes, institutional capacity building, and strengthening community participation.

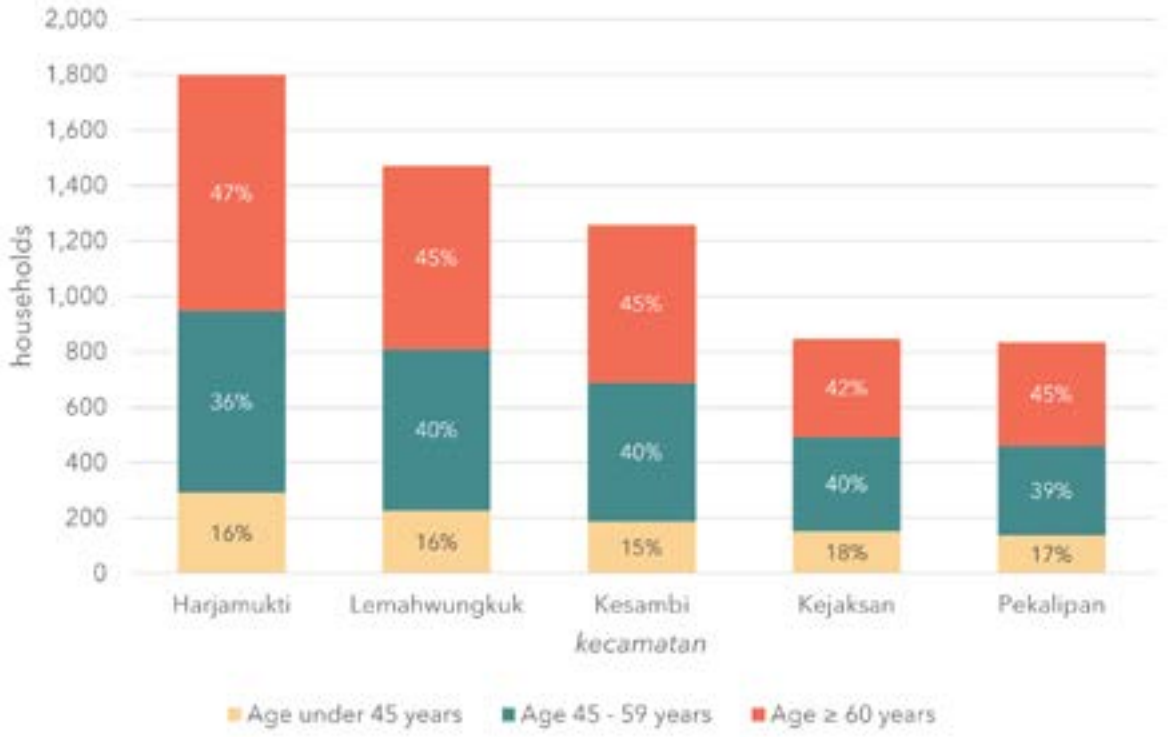
PUG programs in Cirebon City include: Family Resilience Motivator (*Motekar*) program, which trains community social workers to conduct family empowerment activities; Domestic Violence Prevention Task Force (PKDRT) in all *kelurahan;* and Citizens Caring for Children and Mothers (*Wadul Bae*), a digital application for reporting domestic violence against women and children.

In addition to domestic violence prevention efforts, the city government has also made efforts toward women's empowerment. The Women Heads of Family Empowerment Group (PEKKA) provides skills training to poor, female heads of families to increase economic independence, while the Increasing the Role of Women towards a Healthy and Prosperous Family (P2WKSS) program provides training and support to 100 poor families.

MARGINALIZED GROUPS

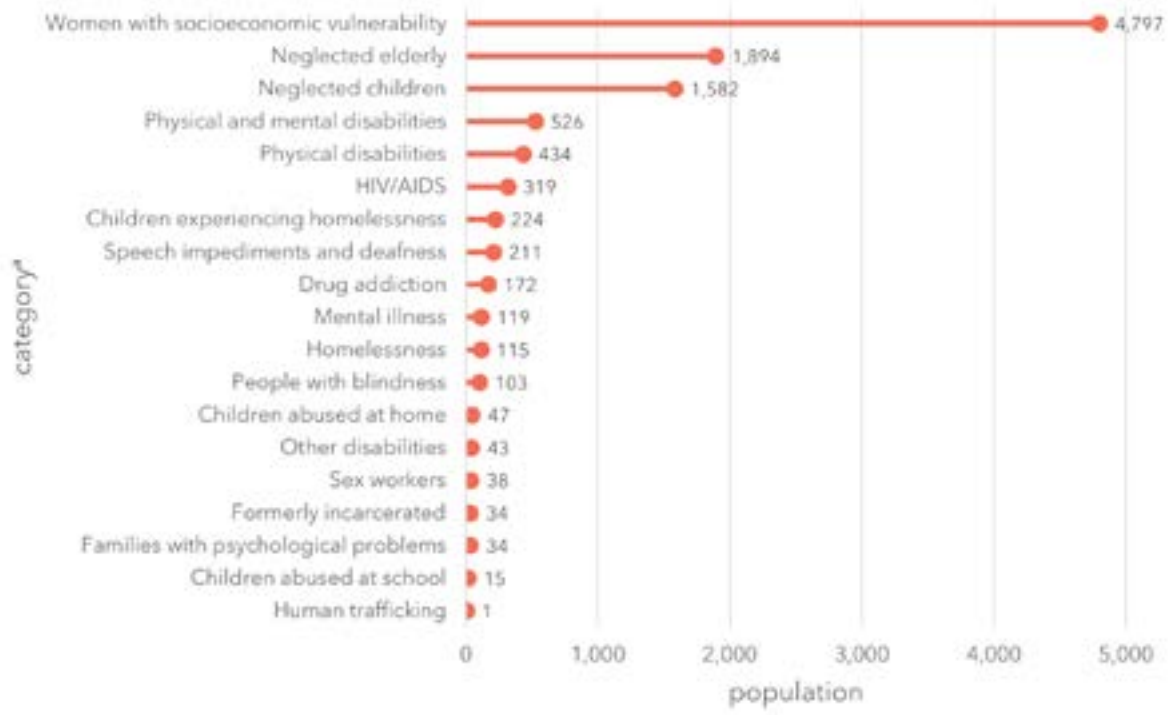
In theory, the Government of Indonesia guarantees protection of human rights against discrimination on any basis.[9] The national Care (*Peduli*) Program has promoted social inclusion as a pathway out of poverty for the following six marginalized groups: 1) vulnerable children and

7. Statistics Indonesia (BPS) Kota Cirebon. 2019. *Cirebon City in Figures 2020.* Cirebon City.
8. Government of Cirebon City. Local Regulation (*Perda*) No. 6/2018 on Gender Administrative Guidelines for Cirebon City.
9. Government of Indonesia. 1999. Law (UU) No. 39/1999 on Human Rights.



Source: TNP2K (2019).

Figure 7.3 Number of female-headed households in the bottom 40% in 2019, by age of head of household



Source: Cirebon City DSPPPA (2018).

Figure 7.4 Populations with social welfare needs (PMKS) in 2018. [a]Poor population omitted for visual clarity

youth; 2) remote indigenous communities reliant on natural resources; 3) discriminated religious minorities; 4) victims of gross human rights violations; 5) transgender people (*waria*); and 6) people with disabilities.[10] However, other national regulations suggest contradictory policies and limited rights for marginalized groups. Regarding LGBTQ issues, laws define "deviant sexual intercourse" as an element of pornography, which is banned.[11] Another regulation states that an adoptive parent cannot be homosexual or unmarried.[12] Despite ratification of the UN Convention on Rights of Persons with Disabilities in 2011 followed by a 2016 law on persons with disabilities, a 2020 working paper found that little progress has been made toward inclusive development.[13]

In Cirebon City, the Department of Social Services, Women's Empowerment, and Child Protection (DSPPPA) is responsible for providing social services to marginalized groups. Since 2018, over 38,000 individuals have had social welfare needs (PMKS), including vulnerable children and elderly, people with disabilities, and formerly incarcerated persons (Figure 7.4). Although national definitions of marginalized groups also include indigenous communities, religious minorities, and waria, city-level data are not available for these populations. DSPPPA data on PMKS have also remained largely unchanged since 2018, making it difficult to measure trends.

In general, marginalized populations experience limited access to information and decision-making processes, with their needs often overlooked. Inadequate urban infrastructure creates safety hazards and hardships for people with physical and mental disabilities, such as open drainage networks, damaged roads, and unaccommodating public facilities. LGBTQ and minority groups are often not involved in community activities due to a sense of discrimination.[14]

However, national and local governments have made some progress toward social inclusion, particularly with mental health. Since 2010, the Ministry of Health's (MoH) Indonesia Free from Shackles (*Indonesia Bebas Pasung*) program has raised awareness about mental health and *pasung*, the practice of shackling persons with mental illness. The program aims to integrate mental health into primary health services by providing healthcare, training, and community mental health teams (TPKJM) to facilitate the release of people from *pasung*. In 2019, the Cirebon City Government signed a joint commitment to be *pasung*-free and establish TPKJM.[15]

YOUTH

The Department of Youth, Sports, Culture, and Tourism (DKOKP) is responsible for youth development and services in Cirebon City. Youth and young people are defined as the population ages 16 through 30. In 2019, the youth population was 84,424, approximately 25% of the total population.[16]
Cirebon City has a multitude of youth organizations, both formally and informally organized. As of 2019, the city had approximately 52 youth organizations,[17] though only about half are active. Examples include a local chapter of Karang Taruna, a youth forum that aims to instill a sense of social responsibility for community welfare, especially at the kelurahan level. Informally organized groups include the punk community, united in an ideology of self-reliance and independence from government assistance and interference. Young people who join the group contribute actively to the community by offering and providing life skills training based on their areas of expertise. In recent years, city residents have begun to accept their presence. Though the city has many politically and socially focused youth organizations, it has few related to sports, culture, or the arts—a potential explanation for the limited number of young people who excel in these areas.[18]

The city government seems very supportive of youth-led efforts. In 2021, the mayor announced that the reemergence of Karang Taruna would reinvigorate various efforts in the city, including combatting the COVID-19 pandemic.[19] The city government's initial responses to ADB's Youth for Asia research in Cirebon City have also been positive and welcoming.

10. Asia Foundation. 2016. *Understanding Social Exclusion in Indonesia.* Jakarta.
11. Government of Indonesia. 2008. Law (UU) No. 44/2008 on Pornography.
12. Government of Indonesia. 2007. Government Regulation (*PP*) No. 54/2007 on Adoption.
13. SMERU. 2020. *Problems in Realizing Inclusive Development for Disabilities*. Jakarta.
14. Field observations from local experts. 2021.
15. Government of Cirebon City. 2019. "Cirebon City Council (DPRD)" (accessed 18 March 2021).
16. Government of Cirebon City. 2019. *Cirebon Satu Data:* Number of youth in 2019 (accessed 18 March 2021); Statistics Cirebon City (BPS) Kota Cirebon. 2019. *Cirebon City in Figures 2020*. Cirebon City.
17. Ibid
18. Field observations from local experts. 2021.

7.3 CITIZEN ENGAGEMENT

Indonesia has a long history of citizen engagement and community empowerment. A visible example is the process of participatory planning (*Musrenbang*), conducted every five years in advance of updating the Regional Medium-Term Development Plan (RPJMD). Community proposals are collected, deliberated, and culled from the neighborhood unit (*rukun tetangga*) level to the city level, informing development plans at each stage.

In urban and social development, the city government continues to actively engage the community in project planning, implementation, evaluation, and sustainability. Government-recognized community empowerment bodies (BKM) in each *kelurahan* coordinate various poverty reduction programs and funds from development partners including governments, NGOs, and private sector. Groups of community volunteers (KSM) form to improve residential areas, especially by implementing infrastructure development activities. In slum upgrading programs, communities may also conduct a Village Self-Survey (SKS) as a baseline for identifying needs and opportunities, an activity that aims to promote shared awareness and understanding of these issues. In certain areas, such as Kampung Benda in Kelurahan Argasunya, any citizen engagement must acknowledge local customs and begin with religious leaders in the village.

7.4 SAFETY AND SECURITY

Two police forces are active in Cirebon City. The Municipal Police (SATPOL PP) is responsible for local law enforcement, with authority under the Ministry of Home Affairs (MoHA). The POLRI, or local branch of the Indonesian National Police, is meanwhile responsible for national law enforcement within the city.

Rukun warga and *rukun tetangga* in Cirebon City also rely on the neighborhood security system (SISKAMLING), which prioritizes prevention for safety and security. Components of SISKAMLING include a community policing partnership; a head security officer (HANSIP) appointed by the community; and implementing members including all heads-of-household and adult males ages 17 and older. Activities include patrolling; providing early warnings for disasters; mediating community disagreements; and coordinating with local police forces.

In 2019, POLRI recorded 762 crimes, a rate of 446 crimes per 100,000 people.[20] Reported crimes included narcotics, homicide, sex with a minor,[21] physical abuse, robbery, fraud, and forgery. Robbery was most common, with more than one in three cases under this category.

The city government has taken some measures to reduce crime rates. The city has installed 30 CCTVs at strategic locations and plans to install another 18 throughout the city.[22] In 2018, DKIS launched an emergency telephone hotline for citizen reporting of incidents and to connect callers to emergency services. However, data from 2020 show that only 3% of calls were given a service ticket whereas the rest were either prank or ghost calls, suggesting challenges with implementation. The city has also issued a regulation on public order.[23]

7.5 DATA AND MAPPING

Since 2018, DKIS has been compiling data from all city agencies into an online database called Cirebon Satu Data. The site includes more up-to-date information than Statistics Cirebon City (BPS) as well as more varied and detailed data across all sectors. Some limitations thus far include empty or incomplete data files.[24]

For spatial mapping, the city does not yet have a publicly accessible mapping system though the city government does produce its own maps with ArcGIS, AutoCAD, and Google Maps. As part of program implementation, KOTAKU has also provided some slum mapping efforts, though these have not been updated to reflect the slum areas identified after 2017.

19. Government of Cirebon City. 2021. Official website: "The reemergence of karang taruna to develop Cirebon City" (accessed 19 March 2021).
20. Calculations based on 2019 registered population.
21. Age of sexual consent between heterosexuals is 15 years old.
22. Radar Cirebon. 2021. "Cirebon City will add 18 CCTVs" (accessed 22 March 2021).
23. Government of Cirebon City. 2019. Local Regulation *(Perda)* No. 13/2019 on Administration of Public Order.
24. Government of Cirebon City. 2018. Official website: "Eight Smart City Applications are ready to be Developed" (accessed 24 March 2021).

The Bank Indonesia building in Kelurahan Lemahwungkuk. Asian Development Bank.

CHAPTER 8

FINANCIAL MANAGEMENT

This chapter outlines public financial management conditions in the city as well as fiscal flows between national, provincial, and city government. The report includes these areas to assess the readiness of the city government to manage and implement development financing in the form of intergovernmental transfers from foreign lending, investment grants, and performance-based grants.

8.1 INTER-GOVERNMENTAL FISCAL SYSTEM

Since the 1999 decentralization reforms in Indonesia, the roles of subnational governments have changed. While provinces *(provinsi)* still largely act as regional representatives of the central government, districts such as cities *(kota)* and regencies *(kabupaten)* have taken on major responsibilities for spending and service delivery. Despite autonomy over spending however, districts still have very limited autonomy to raise own-source revenue to finance service delivery and therefore remain largely dependent on intergovernmental transfers.[1]

Several key types of intergovernmental transfers are relevant to Cirebon City's administrative status as a *kota*.

- The General Allocation Fund (DAU) is the main unconditional grant for fiscal equalization across subnational governments. It is intended to support regional development, especially capital expenditure on infrastructure development and public services. DAU transfers make up the largest share of district revenues.
- The Special Allocation Fund (DAK) is an earmarked grant conditioned on specific sectoral spending priorities. The DAK Fisik supports capital investments while the DAK non-Fisik co-finances recurrent expenditures such as health and education assistance. To receive DAK, subnational governments must submit grant proposals to the central government.
- The Profit Sharing Fund (DBH) is an unconditional transfer for fiscal equalization sourced from either tax (DBH-P) or non-tax state revenue (DBH-SDA). The DBH-P is based on land and building taxes, income taxes, and customs. The DBH-SDA includes non-tax revenues from natural resources including forestry, oil and gas, minerals and coal, geothermal, and fisheries sectors.
- Hibah Daerah is an earmarked grant that transfers rights over money, goods, or services to subnational governments. A relevant example is the water Hibah, which reimburses participating subnational governments for water connections to poor households and may serve as a precedent for performance-based infrastructure grants.[2]
- The Ministry of Finance's (MoF) Regional Incentive Fund (DID) is an earmarked transfer conditioned on a combination of input, process, output, and outcome indicators. It intends to reward subnational governments for sound spending behavior.

8.2 NATIONAL BUDGET

The Government of Indonesia's national spending priorities currently include tackling challenges associated with COVID-19 and building a stronger foundation in human resources, economic productivity, innovation and competitiveness, and infrastructure development. Infrastructure spending will be directed towards strengthening digital infrastructure and encouraging logistical efficiency and connectivity; labor-intensive infrastructure that supports industrial and tourism areas; construction of public health facilities; and provision of basic infrastructure.

REVENUE AND

1. World Bank. 2020. *Indonesia Public Expenditure Review.* Washington, DC.
2. Ibid.

EXPENDITURES

In the annual state budget (APBN) for 2021, the GOI estimates revenues of US$120.2 billion (Rp1.743,6 trillion), with 83% from tax revenue and 17% from non-tax revenue (PNBP). For expenditures, the GOI has allocated US$189.7 billion (Rp2.750,0 trillion), with 71% allocated to the central government and 29% to intergovernmental transfers (TKDD). Compared to the 2020 APBN, the spending allocation has increased by 0.4% and will be used to support health management, economic recovery, and development priorities in various sectors. Allocations of note include:

- 20% to education, US$37.9 billion (Rp550 trillion);
- 15% to infrastructure, US$28.8 billion (Rp417,4 trillion);
- 15% to social protection, US$28.2 billion (Rp408,8 trillion);
- 6% to health, US$11.7 billion (Rp169,7 trillion);
- 4% to food security, US$6.8 billion (Rp99 trillion); and
- 1% to information and communications technology, US$1.8 billion (Rp26 trillion).

Prior to the COVID-19 pandemic, planned infrastructure investment for the period 2020-2024 totaled approximately US$444.4 billion (Rp6.445 trillion), with 42% from the private sector; 37% from the APBN, and the balance from development cooperation. Due to emergency expenditures related to pandemic response, however, fiscal space may be more limited.

DEFICIT FINANCING

The 2020 budget deficit reached US$65.9 billion (Rp956,3 trillion) or 6.1% of GDP, lower than the estimated deficit of 6.4% of GDP. Besides increased coordination with Bank Indonesia, the GOI has also financed the deficit through securities and loans, totaling US$84.6 billion (Rp1.226,8 trillion), with 96% from securities and 4% from loans. Government stimulus efforts also included support to state-owned enterprises (BUMN), public service agencies (BLU), and other government institutions to accelerate national economic recovery.

Alternative financing schemes also remain a focus of the GOI, especially in infrastructure development. To date, 21 PPP projects with a total investment value of US$18.7 billion (Rp272 trillion) have been signed. Nine projects have started operating, including the Palapa Ring and several toll roads; another nine projects are under construction; and the remaining are in the financial close stage.

In early 2021, the GOI also launched the Indonesia Investment Authority (INA), an investment fund that aims to attract foreign capital in the form of equity participation rather than loans.[3] The GOI hopes that the INA will provide a new source of development financing, especially in the infrastructure and energy sectors. Countries that have expressed investment interest include the United States, Japan, the United Arab Emirates, Saudi Arabia, and Canada. Other alternative financing schemes for infrastructure investment include blended financing, direct assignment of BUMN, and limited concession schemes (HPT).

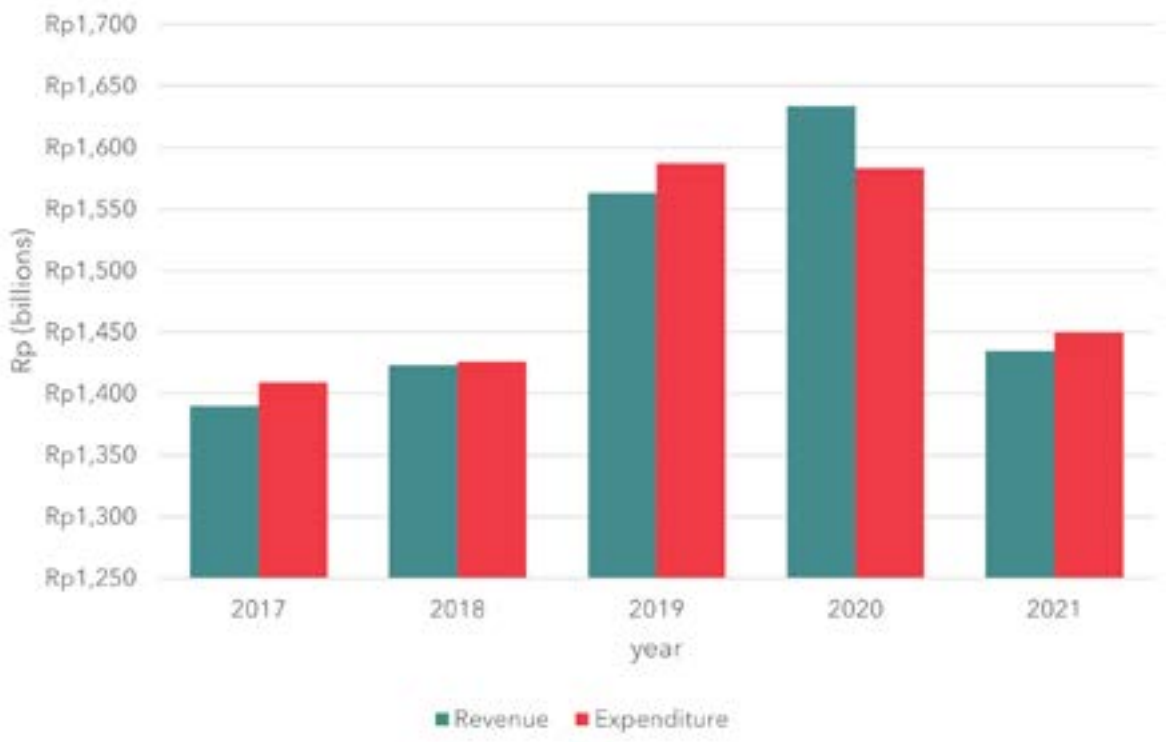
8.3 MUNICIPAL FINANCING

The city budget (APBD) consists of three main categories of revenues: 1) own-source revenue (PAD), including local taxes, retributions, and profit from city-owned enterprises; 2) intergovernmental transfers, particularly for fiscal equalization such as DAU, DAK, and profit sharing; and 3) other sources, including Hibah, DID, and intergovernmental transfers from provincial governments.

The main categories of spending are: 1) recurrent expenditure, for short-term costs such as operations, wages, and social assistance; 2) capital expenditure, for long-term investments such as infrastructure and equipment; and 3) unexpected expenditure. The city government also categorizes expenditure into indirect and direct spending. The former includes wages, subsidies, social assistance, and unexpected expenditure not directly related to program activities; the latter includes wages, goods and services, and capital expenditure directly related to program implementation.

Between 2017 and 2020, overall actual expenditures outweighed actual revenues except in 2020, when central and provincial governments

3. Also referred to as Indonesia's sovereign wealth fund although its structure does not meet the standard definition.
4. Statistics Indonesia (BPS) Kota Cirebon. *Cirebon City in Figures 2019 and 2020.* Cirebon City; Government of Cirebon City. 2021. Official website: "Transparency in Regional Financial Management" (accessed 4 May 2021).

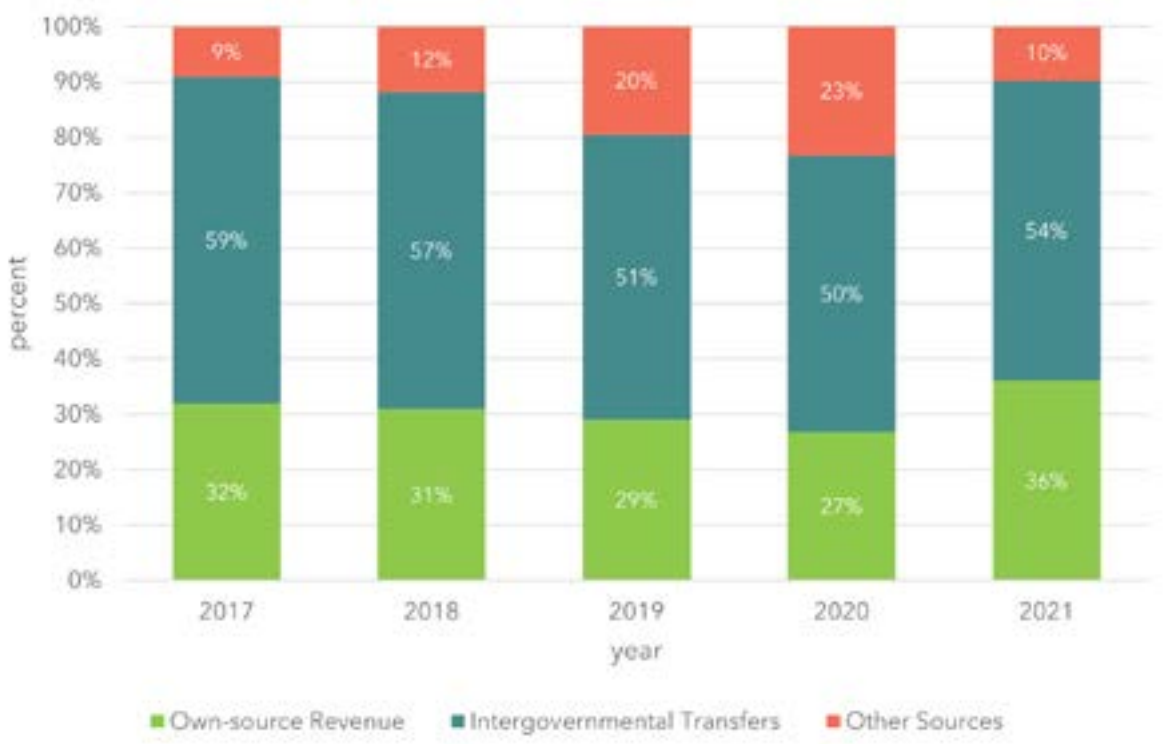


Source: Cirebon City BPS (2017-2020); Government of Cirebon City (2021)

Figure 8.1 Cirebon City Total Revenue and Expenditure between 2017 and 2021. All years show actual figures except for 2021

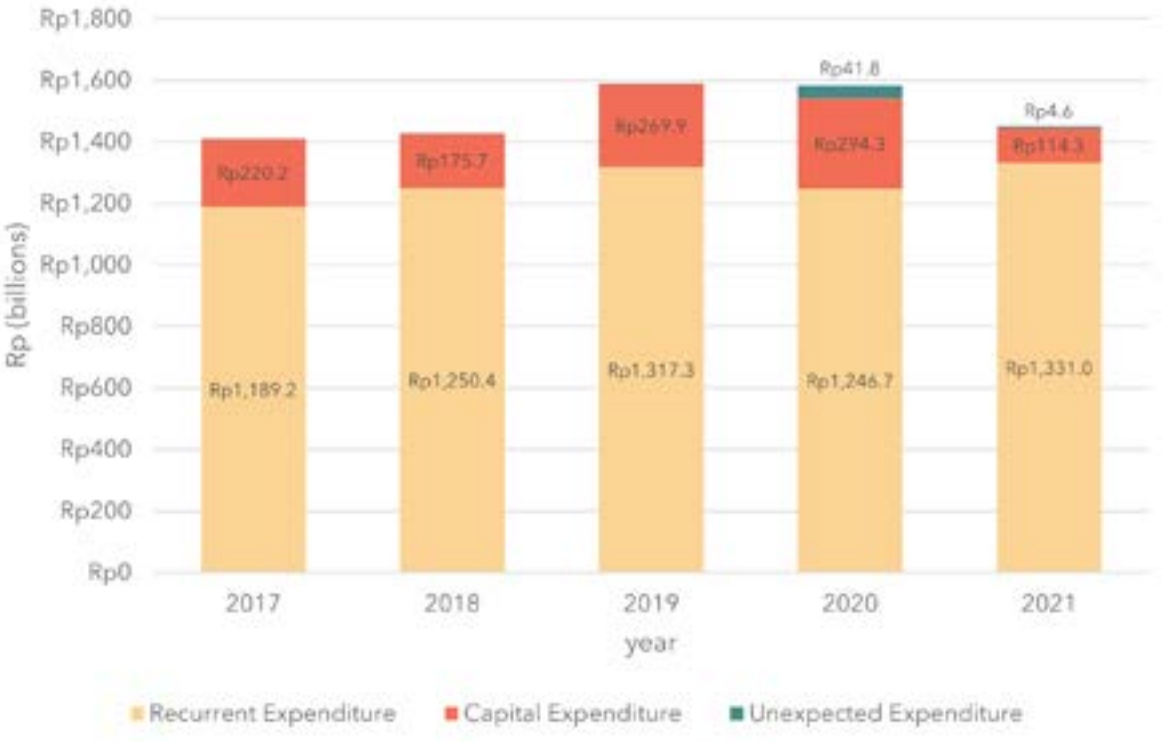
Source: Cirebon City BPS (2017-2020); Government of Cirebon City (2021)

Figure 8.2 Cirebon City Revenue between 2017 and 2021. All years show actual figures except for 2021



Source: Cirebon City BPS (2017-2020); Government of Cirebon City (2021)

Figure 8.3 Cirebon City Revenue Composition between 2017 and 2021. All years show actual figures except for 2021



Source: Cirebon City BPS (2017-2020); Government of Cirebon City (2021)

Table 8.4 Cirebon City Expenditure between 2017 and 2021. All years show actual figures except for 2021

provided additional financial assistance to cover costs of pandemic response (Figure 8.1).[4] For 2021, planned expenditures will again outweigh planned revenues.

REVENUE

Between 2017 and 2020, actual revenue grew at an average annual rate of 5.5%,[5] increasing from US$103.9 million (Rp1,39 trillion) to US$112.3 million (Rp1,63 trillion).[6] Although planned revenue for 2021 shows a 12% decrease from actual revenue in 2020, own-source revenue is expected to increase in absolute terms (Figure 8.2), which may suggest that the city anticipates strong domestic resource mobilization.

Like many other *kota*, intergovernmental transfers for fiscal equalization comprise the largest share of Cirebon City's revenue composition (Figure 8.3). Except in 2020, DAU transfers have consistently made up some 70% of intergovernmental transfers and are projected to again reach this share in 2021. DAK transfer amounts meanwhile have fluctuated, perhaps suggesting that Cirebon City has not performed consistently in developing grant proposals for DAK allocations.

EXPENDITURE

Actual spending increased at an average annual rate of 3.9% between 2017 and 2020,[7] from US$105.4 million (Rp1,41 trillion) to US$108.8 million (Rp1,58 trillion). Planned spending for 2021 shows an 8% overall decrease compared to 2020, with the allocation for capital expenditure showing a 61% decrease (Figure 8.4). These figures suggest that the city plans to reduce its spending on infrastructure for 2021 and prioritize operations and pandemic response.

Since 2018, the city government has consistently allocated a larger share of expenditure to direct spending (Figure 8.5).[8] Despite unexpected expenditure increasing over 900 times in 2020,[9] likely related to the pandemic response, the city government's actual direct spending still outweighed its indirect spending. This prioritization of services and capital expenditure directly related to program implementation may indicate strong political commitment toward regional development and social welfare.

FINANCING

Beyond revenue and expenditure, the APBD also includes planned allocations for regional financing. Capital investment in city-owned enterprises (BUMD), particularly PERUMDAM Tirta Giri Nata, in the form of equity participation shows an overall increase since 2017 despite zero investment in 2020 (Figure 8.6).[10] Planned investment for 2021 shows that the city intends to inject approximately US$660,000 (Rp9,30 billion) into its BUMD, the largest amount of capital investment in the past five years. This planned allocation for capital investment suggests that while the 2021 APBD does not prioritize capital expenditure, the city government is still committed to the provision of urban infrastructure and services through other means.[11]

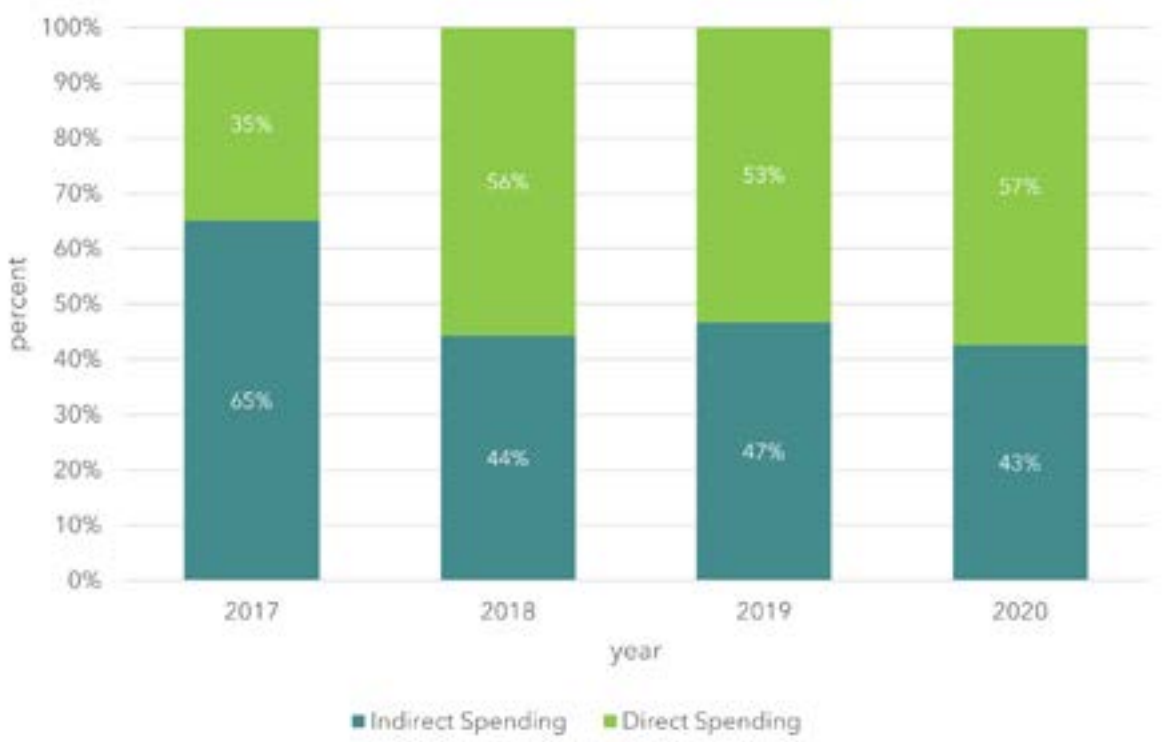
8.4 URBAN INFRASTRUCTURE ALLOCATIONS

Recent budget allocations for specific urban infrastructure sectors are summarized in Table 8.1.

WATER SUPPLY

In 2015, PERUMDAM Tirta Giri Nata was considered relatively healthy, with an average employee to customer ratio of 4.4 people per 1,000 customers.[12] Based on a performance audit, PERUMDAM is also achieving full cost recovery. Due to tariff increases, revenue has continued to increase despite a slow growth in new connections and a decrease in the amount of water sold. However, compared to tariff rates charged by local water corporations in other urban areas, PERUMDAM Tirta Giri Nata's tariffs are relatively low, suggesting potential justification for tariff adjustments. Operating profit and loss trends show annual increases in profits.[13]

5. Compound annual growth rate calculations based on Statistics Indonesia (BPS) Kota Cirebon. 2020. *Cirebon City in Figures 2020*. Cirebon City.
6. Government of Cirebon City. 2020. Official website: "Transparency in Regional Financial Management" (accessed 26 April 2021). Revenue in 2020 reflects revised APBD (APBD-P) figures.
7. Compound annual growth rate calculations based on Statistics Indonesia (BPS) Kota Cirebon. 2020. *Cirebon City in Figures 2020*. Cirebon City.
8. Government of Cirebon City. *Summary of Local Budget (APBD) 2017-2020*. Cirebon City.
9. Statistics Indonesia (BPS) Kota Cirebon. *Cirebon City in Figures 2019 and 2020*. Cirebon City. Unexpected expenditure increased from only US$3,300 (Rp46,2 million) in 2019 to US$2.9 million (Rp41,8 billion) in 2020.
10. Government of Cirebon City. *Summary of Local Budget (APBD) 2017-2019; Summary of Local Revised Budget (APBD-P) 2020*. Cirebon City.
11. Government of Cirebon City. 2020. Local Budget Actuals Report (LRA) 2020. Cirebon City.
12. PERUMDAM Tirta Giri Nata of Cirebon City. 2016. *Corporate Plan of PERUMDAM Kota Cirebon for 2017-2021*. Cirebon City.
13. Ibid



Source: Government of Cirebon City (2017-2020).

Figure 8.5 Cirebon City Planned Indirect and Direct Spending between 2017 and 2020

SANITATION AND WASTEWATER

Budget allocation for routine operations of the technical implementation unit (UPTD) is approximately US$550,000 (Rp8 billion) annually, excluding wastewater treatment plant (IPAL) repairs. In 2019, the UPTD proposed nearly US$210,000 (Rp3 billion) of improvements in wastewater infrastructure, including 500 house connections (SR). However, the West Java Regional Development Planning Agency (BAPPEDA JABAR) only approved revitalization plans for the Kesenden IPAL for the 2020 fiscal year.[14]

STORMWATER DRAINAGE AND FLOODING

In 2020, the city government allocated US$830,000 (Rp12 billion) for drainage normalization and rehabilitation,[15] more than double the 2019 allocation.[16] Budget allocation for drainage maintenance was US$10,000 (Rp150 million).[17]

SOLID WASTE MANAGEMENT

In 2016, the local budget allocation for the solid waste sector was US$1.2 million (Rp16,2 billion), or approximately 1% of the total APBD. Revenues from waste management retributions and fees totaled approximately US$156,000 (Rp2,1 billion).[18]

14. Forkalim. 2019. *Domestic Wastewater Management Needs Support.* Published in Drinking Water Magazine, Edition: 287.
15. Sinar Pagi Baru. 2020. "Cirebon City PUPR Agency will prioritize the Drainage and Sidewalks due to limited budget" (accessed 22 March 2021).
16. Cirebon Pos. 2020. "Limited Budget for Drainage" (accessed 22 March 2021).
17. Radar Cirebon. 2020. "Cirebon City Drainage Maintenance Budget" (accessed 22 March 2021).
18. Prihatin, R. 2020. "Waste Management in Medium Type Cities: Case Studies in Cirebon City and Surakarta City." *Aspirasi: Jurnal Masalah-Masalah Sosial*. Jakarta.
19. Fajar Cirebon. 2021. "Limited Fire Vehicles in Cirebon City" (accessed 15 March 2021). The city government originally allocated US$1.3 million (Rp19 billion) to Damkar, but more than half of the budget was reallocated to COVID-19 expenditures.
20. Lia, E. 2020. "Revitalization of the BAT (British American Tobacco) Park and Replication of the Pedati Gede Train" (accessed 22 January 2021).
21. DPRD of Cirebon City. 2020. "DPRD Commission II Asks DPRKP to Prioritize RUTILAHU Assistance Programs" (accessed 15 January 2021).

Source: Government of Cirebon City (2017-2021).

Figure 8.6 Cirebon City Planned Capital Investment in BUMD between 2017 and 2020

No	Infrastructures and Services	Activities	Year	Amount (USD)
1	Water Supply	No data	-	-
2	Sanitation and Wastewater	Routine operations for UPTD	Annually	US$550,000 (Rp8 billion)
3	Stormwater Drainage and Flooding	Drainage normalization and rehabilitation	2020	US$830,000 (Rp12 billion)
		Drainage maintenance		US$10,000 (Rp150 million)
		Drainage normalization and rehabilitation	2019	US$350,000 (Rp5 billion)
4	Solid Waste Management	-	2016	US$1.2 million (Rp16,2 billion)
5	Fire Protection[19]	Damkar operations	2020	US$620,000 (Rp9 billion)
6	Public Space[20]	Development of public green open spaces	2021	US$132,000 (Rp1,9 billion)
7	Housing and Shelter[21]	Home improvements to uninhabitable dwellings	2021	US$28,000 (Rp400 million)
8	Mobility and Transportation	BRT operations	2021	US$35,000 (Rp500 million)

Source: authors

Table 8.1 Summary of Budget Allocations for Urban Infrastructures and Services

Aerial view of Cirebon City, looking east. Government of Cirebon City.

CHAPTER 9

CONCLUSION

Cirebon City is a vibrant secondary city whose seafaring traditions and royal heritage provide a backdrop of cultural complexity to the burgeoning economic growth. In the last ten years, the city's GRDP has grown at an average annual rate of 5.8%, with the information and communications industry growing at over 10% on average. Nearly half of micro, small, and medium enterprises specialize in culinary arts, and an estimated one in four residents are young people. Located along Indonesia's largest economic corridor and within the planned REBANA (Cirebon-Subang-Majalengka) metropolitan area, Cirebon City will likely continue to capture the benefits of its strategic location and creative industries.

However, the city faces numerous challenges related to its social development and urban environment, which the COVID-19 pandemic has only exacerbated. As of 2020, more than one in three city residents were receiving social assistance—four times the official poverty figures. Nearly one in five city residents live in slums. Although nearly 90% of the population have access to piped drinking water, coastal slum communities still cannot meet daily water needs. Off-site sanitation is also minimal, serving only an estimated 8% of the total population. Environmental quality is poor, with public green open space making up only 5% of total land area and land reclamation activities further degrading the marine ecosystem. To compound these urbanization challenges, climate change is projected to increase the frequency and intensity of flooding. These cross-cutting issues will require integrated solutions for a sustainable recovery.

In anticipation that providing physical infrastructure alone will not be enough to achieve citywide urban resilience, this report has provided a holistic assessment of the city across four key dimensions: built capital; human capital; natural capital; and social capital. The report has also included both citywide and slum-level data to support at-scale solutions. Although the report relies mainly on available secondary data, its comprehensive nature will nonetheless be useful for government and non-state actors in understanding existing conditions and preparing urban investment proposals in Cirebon City.

As shown in this urban resilience assessment, a systems approach will be necessary to counter development challenges in Cirebon City. While provision of urban infrastructure and services is key to slum alleviation, project sustainability will ultimately depend on details such as financing, construction, and maintenance. Additionally, investing in the non-physical aspects of a city, such as human capital, will be equally important to advancing the resilience of the urban poor and must be explored. Lastly, building on the team's mix of international and local experts, which allowed for both outsider perspective and insider knowledge, the involvement of diverse local stakeholders will be critical in developing projects for future financing. A strategy that respects the interdependency of cities and slums can best achieve livable settlements.

APPENDICES

1. Potential new slum areas in Cirebon City
2. Cirebon City Housing and Settlements Area Working Group (POKJA)
3. Potential impacts from climate variability through the 2030s
4. Select ur-scape analyses
5. Cirebon City urban policy and planning framework

APPENDIX 1. POTENTIAL NEW SLUM AREAS IN CIREBON CITY

Kecamatan	Kelurahan	Neighborhood	2020 area (Ha)	Total Area (Ha)
Harjamukti	Harjamukti	RW 03	4.7	43.6
		RW 06	17	
		RW 07	5.4	
		RW 10	9.5	
		RW 13	7	
	Kecapi	RW 01	17	51.3
		RW 02	13.5	
		RW 03	13.2	
		RW 18	7.6	
	Kalijaga	RW 02	5.5	87.9
		RW 03	18	
		RW 04	8	
		RW 05	30	
		RW 06	9	
		RW 07	4.4	
		RW 15	13	
	Larangan	RW 19	5.3	5.3
Total Harjamukti				**188.1**
Kejaksan	Sukapura	RW 03	5.94	11.86
		RW 04	3.01	
		RW 05	2.91	
	Kejaksan	RW 05	5.33	13.69
		RW 06	3.22	
		RW 07	5.14	
Total Kejaksan				**25.55**
Kesambi	Sunyaragi	RW 01	3.9	16.8
		RW 02	5.2	
		RW 04	4.3	
		RW 06	3.4	
	Kesambi	RW 02	3.8	10.4
		RW 04	6.6	
	Karyamulya	RW 01	2.2	10.2
		RW 03	4	
		RW 07	4	
	Pekiringan	RW 06	3.9	3.9
	Drajat	RW 01	6.7	10.1
		RW 09	3.4	
Total Kesambi				**51.4**
Total Area of Potential Slums				**265.05**

Source: Cirebon City KOTAKU (2020).

APPENDIX 2. CIREBON CITY HOUSING AND SETTLEMENTS AREA WORKING GROUP (POKJA)

No	Division	Agencies	Roles
1	Planning and Financing Division	• BP4D • Regional Financial Agency (BKD) • Department of Public Works and Spatial Planning (DPUPR) • Department of Environment (DLH) • Department of Housing and Settlements (PERKIM)	• Provide input on policy implementation for housing and settlements • Facilitate preparation of the Medium-Term Investment Development Plan (RPIJM) for housing and settlements • Facilitate preparation of programs and financing in the implementation of RPIJM for housing and settlements • Facilitate the integration of development programs in the RPIJM with the RPJPD and RPJMD • Verify problems in planning and provide alternative solutions • Facilitate budgeting related to housing and settlements programs • Make inventory of financing needs in housing and settlements planning • Facilitate financing mechanisms and financial institutions to meet housing needs of the poor
2	Advocacy and Partnership Division	• Regional Secretariat (Sekda) • BP4D • Department of Public Works and Spatial Planning (DPUPR) • Department of Housing and Settlements (PERKIM) • Department of Industry, Trade, and SME Cooperatives (DPKUKM) • West Java-Banten Bank (BJB) • PERUMDAM Tirta Giri Nata	• Advocate to ensure housing and settlements are a development priority • Socialization of policies and planning for housing development • Build synergy and coordination among housing development actors • Coordinate with all actors in housing and settlements area development
3	Technical and Community Empowerment	• Department of Housing and Settlements(PERKIM) • Department of Public Works and Spatial Planning (DPUPR) • Department of Environment (DLH) • BP4D • Department of Social Services, Women's Empowerment, and Child Protection (DSPPPA) • Fire Department (DAMKAR)	• Facilitate information, consultation, and mediation services to communities • Carry out capacity building • Ensure the construction of housing and settlements benefits communities and fulfills basic needs • Ensure the implementation of housing and settlements activities aligns with the RTRW of Cirebon City
4	Data Collection and Evaluation	• Department of Housing and Settlements (PERKIM) • Department of Informatics Communication and Statistics (DKIS) • Municipal Police (SATPOL PP) • Land Administration Office (Kantah BPN) • BP4D	• Provide data to inform policymaking for housing development and settlement areas • Facilitate the implementation and monitoring and evaluation of housing and settlements program • Develop community awareness campaigns for managing healthy housing and settlements environment • Synchronize data on housing and settlements from various leading sectors

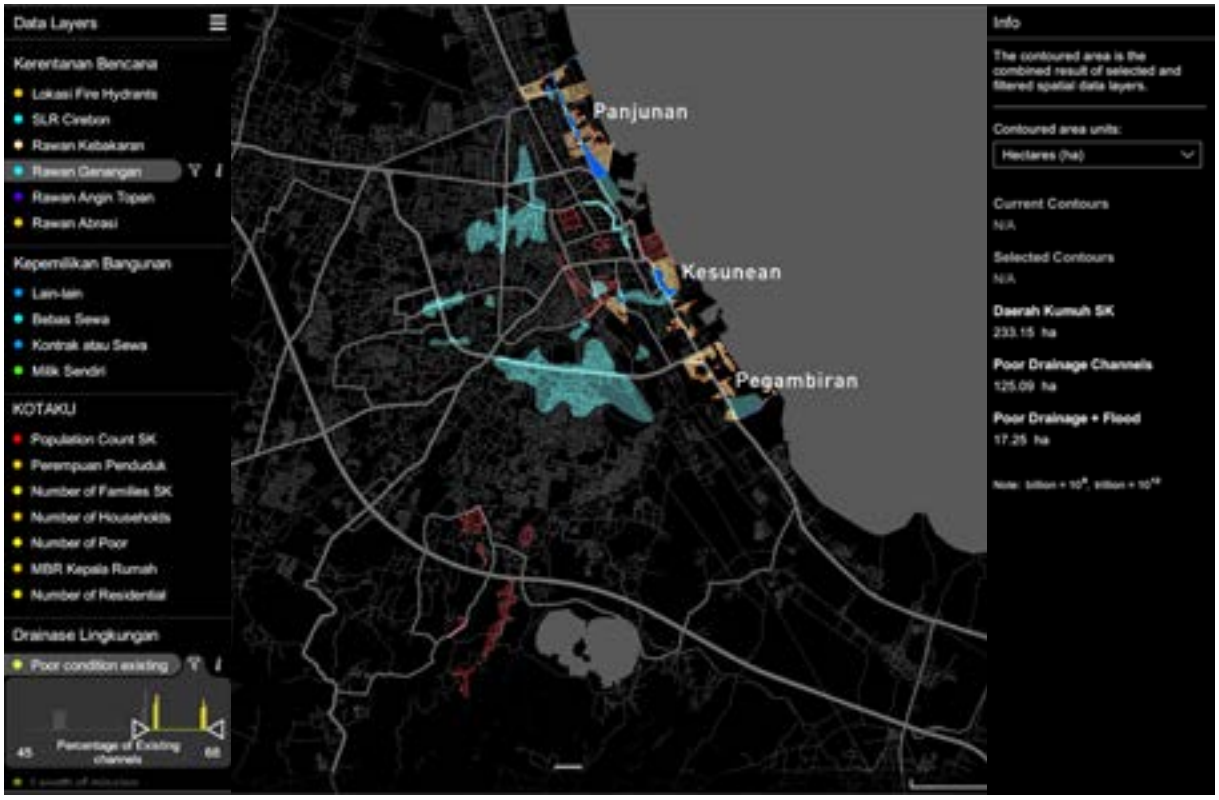
Source: Mayoral Decree No.663/2017

APPENDIX 3. POTENTIAL IMPACTS FROM CLIMATE VARIABILITY THROUGH THE 2030s

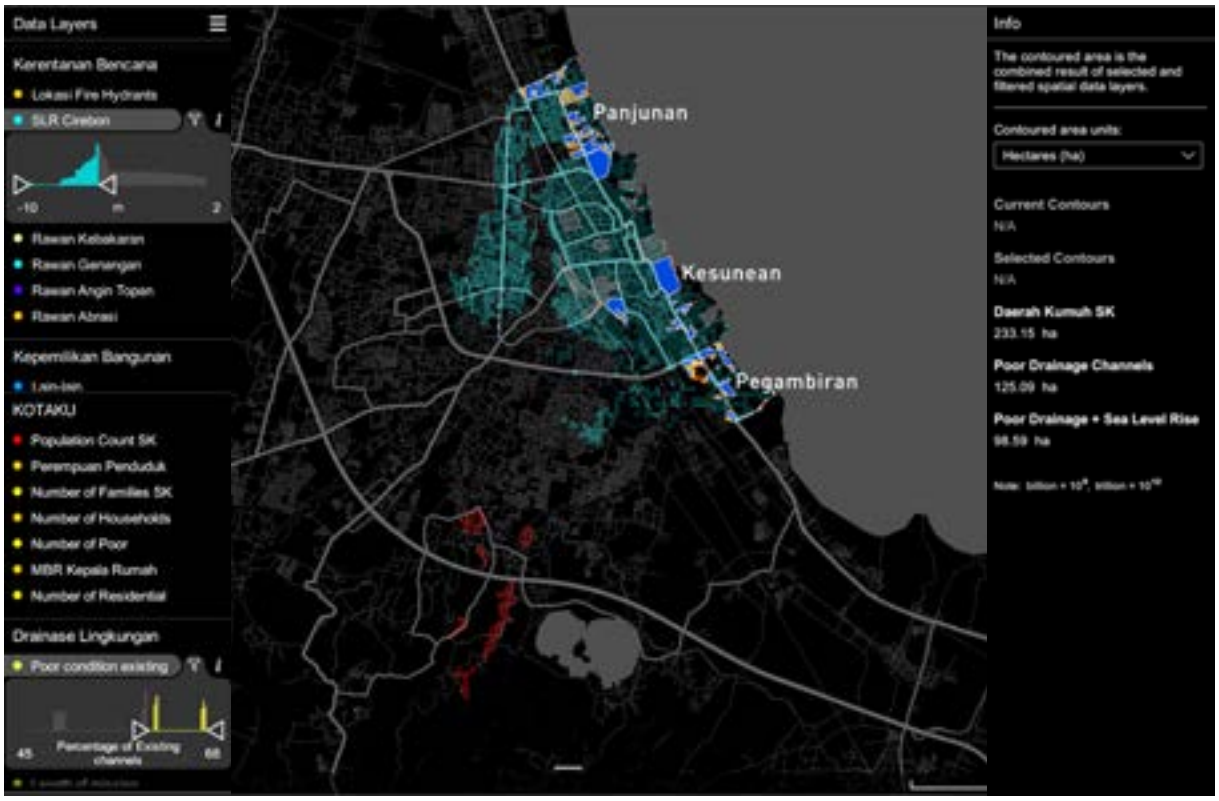
Climate hazards	Climate projections	Potential impacts	Sources
Monsoon (wet and dry seasons)	CMIP5 suggests increases in total annual rainfall and consecutive numbers of wet days but not in consecutive dry days; CORDEX-SEA shows lower annual totals, drier boreal summers and more consecutive dry days when global warming reaches 2°C	More surface water flooding in boreal winter; backwater flooding from upstream areas during high tides and heavy rainfall; blackwater and septic tank overflow; waterborne disease	Putra et al. (2020); Tangang et al. (2018; 2020a)
Storms	CORDEX-SEA changes in annual maximum 1-day rainfall (RX1day) and number of days with rainfall exceeding 50 mm (R50mm) lie within the range of climate model uncertainty and natural variability; NEX-GDDP shows that these indices are expected to increase over the longer-term but there are considerable biases in daily metrics	More landslides; storm surge and coastal flooding; wind and rain damage to buildings; blackouts; agricultural losses	Mandapaka and Lo (2018); Raghavan et al. (2018); Tangang et al. (2020b); Annex 4
ENSO /IOD teleconnections	CMIP5 shows a tendency towards more extreme El Niño (and La Niña) extremes with unabated greenhouse-gas emissions; more ENSO-related extreme temperatures and aridity in the dry season; diversity and overly large amplitudes in simulated IOD in CMIP5 result in a wide range of future boreal autumn rainfall trends over IOD-influenced regions	Increased likelihood of monsoon drought and fires; lower expected annual damage from pluvial flooding; lower tide and surge components; less frequent lightning in rainy season; agricultural losses	Sahu et al. (2012); Weller and Cai (2013); Zheng et al. (2013); Cai et al. (2015); King et al. (2016); Yuan et al. (2016); Qalbi et al. (2017); Le and Bae (2019); McKenna et al. (2020)
Sea level rise	Sea level rise projections could not be found for Indonesia although mapping research suggests that by 2030, land up to 1,900 m inland will be vulnerable to sea level rise of 2 m (Figure 6a). Altimetry data show historic rates of 3.9 mm/yr for the Java Sea; this rate is accelerating due to rising sea surface temperatures, but is spatially variable and modulated by ENSO; scenarios of coastal population growth combined with 1-in-100 year storm surge events show that Indonesia has the fifth (in 2000) and fourth (by 2060) largest flood-exposed population in the world; an upper bound sea level rise estimate for the Singapore region shows 1.0 m under RCP8.5 by 2100	More frequent/ severe tidal floods and storm surges on top of rising sea levels; salinization of groundwater; coastal erosion; loss of land and coastal habitats	Neumann et al. (2015); Cannaby et al. (2016); Andreas et al. (2017); Kismawardhani et al. (2018)
Heat waves	CMIP5 suggests rises in monthly maximum and minimum air temperatures; El Niño and human-induced climate change substantially increase the likelihood of rainfall deficits and high temperatures in the dry season; under a global warming scenario of 2.7°C, Jakarta could become like Lahore, Pakistan (present), with ~7 days per year with dangerous heat	More heat-related morbidity and mortality; water and vector borne disease; reduced labour capacity; more intense urban heat island; poorer air quality	Dunne et al. (2013); King et al. (2016); Matthews et al. (2017); Matthews (2018); Annex 4
Drought	See 'ENSO /IOD teleconnections' projections.	More variable water quality and intermittent water supply; poorer groundwater quality; damage to habitats and green spaces; poorer air quality (linked to fires in the region)	Harger (1995); D'Arrigo et al. (2006); Pratiwi et al. (2018); De Luca et al. (2020); Annex 4

Source: Wilby. 2020.

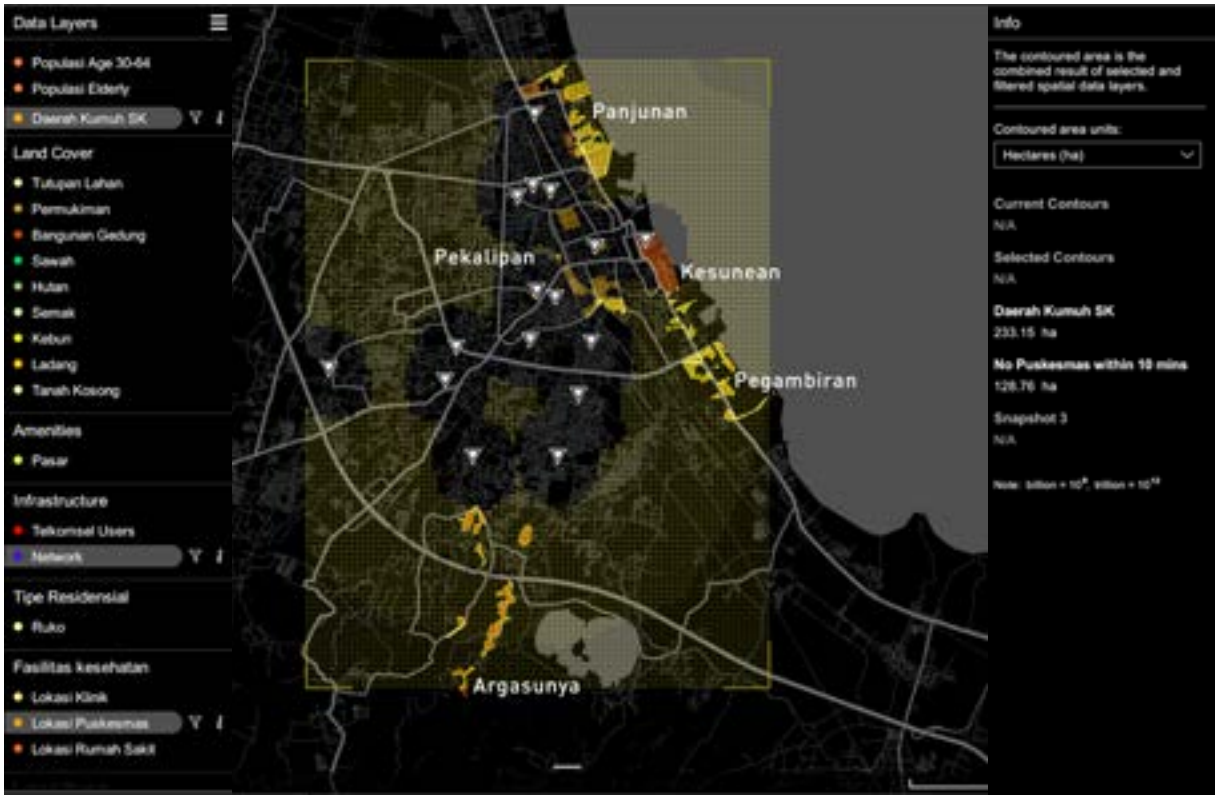
APPENDIX 4. SELECT UR-SCAPE ANALYSES



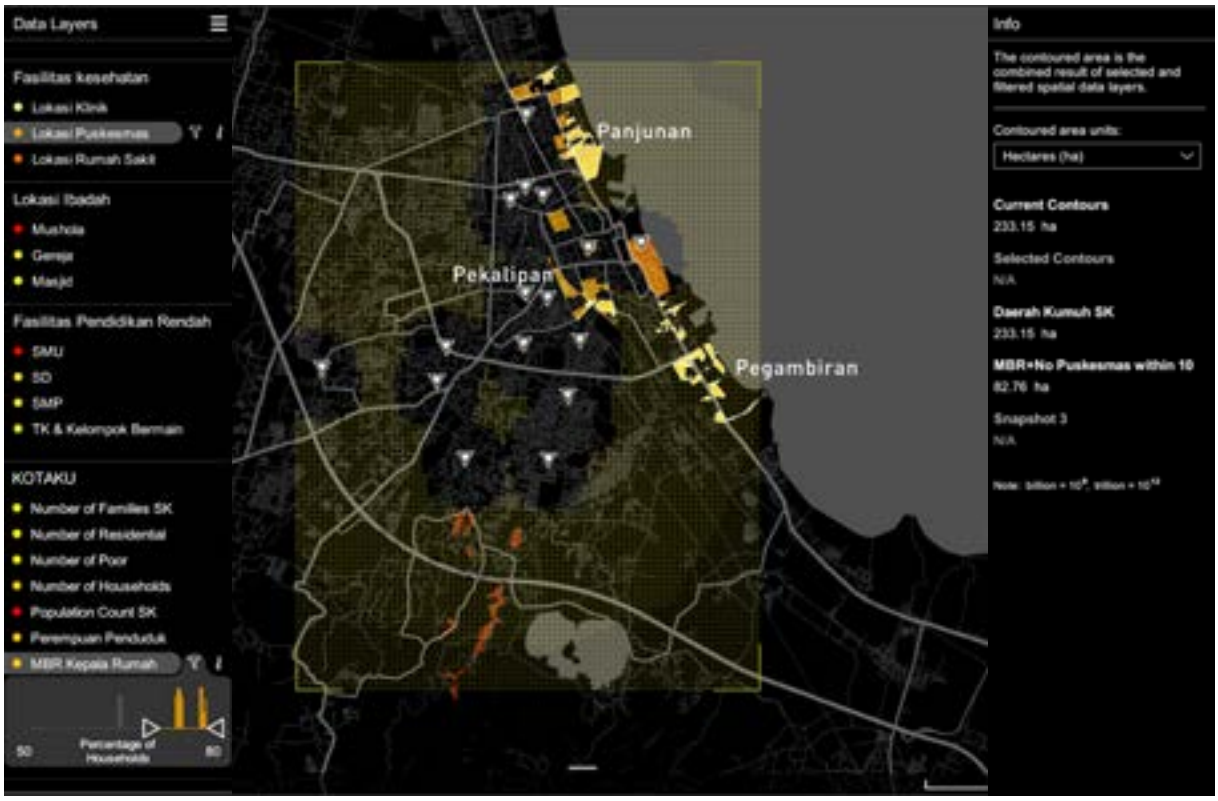
Appendix 4.1 Stormwater Drainage and Flooding in Slums
Approximately 7% of total slum area is flood-prone and have poor neighborhood drainage systems with open drains or visible damage.



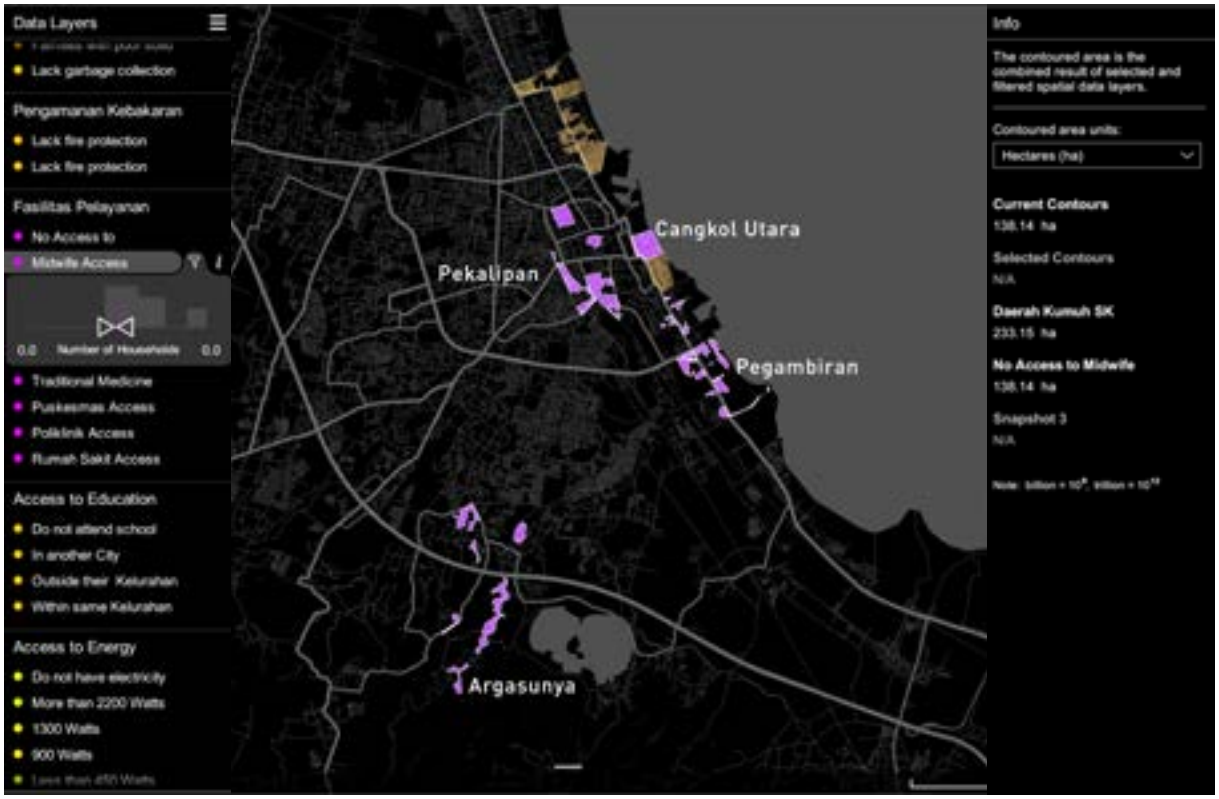
Appendix 4.2 Stormwater Drainage and Sea Level Rise in Slums
Approximately 42% of total slum area is vulnerable to sea level rise up to 2 m and have poor neighborhood drainage systems with open drains or visible damage.



Appendix 4.3 Access to Healthcare in Slums
Approximately 55% of total slum area has no access to a puskesmas within a 10-minute walk radius (800 m).

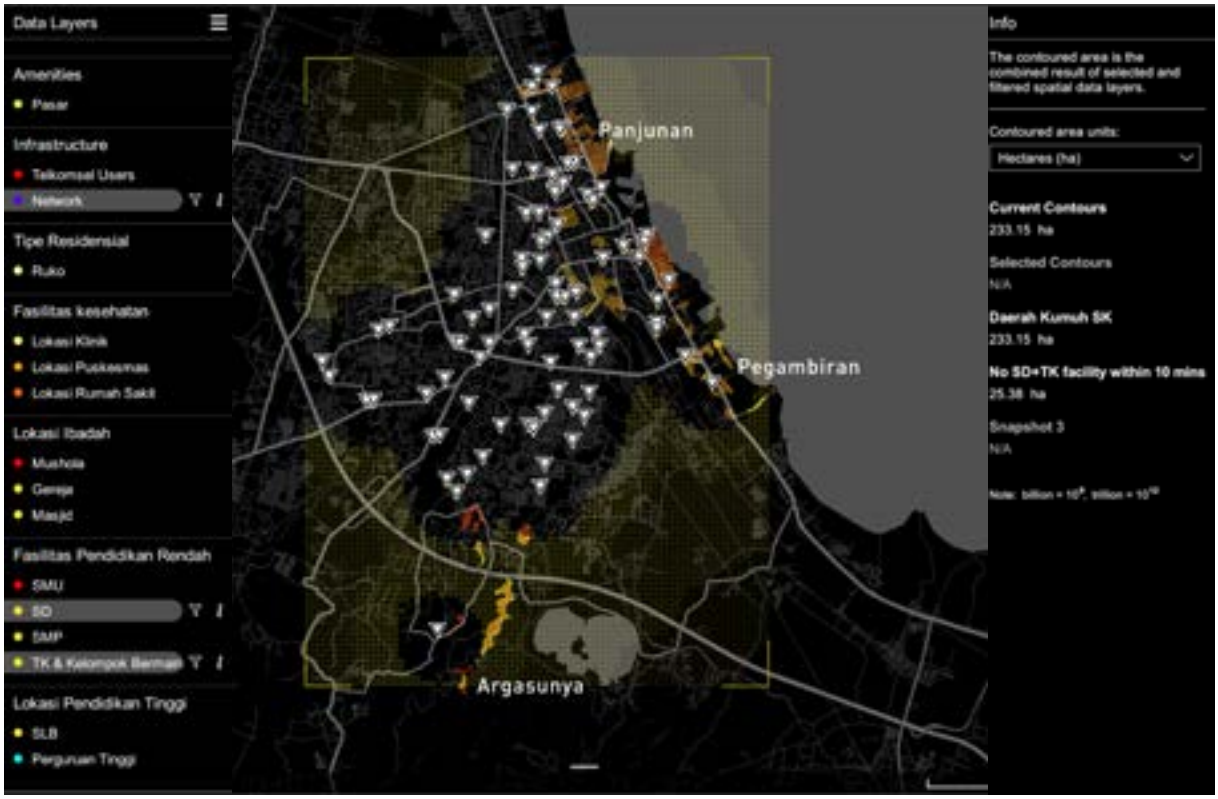


Appendix 4.4 Access to Healthcare for Low-Income Households (MBR) in Slums
Approximately 35% of slum areas with more than 50% of MBR households have no access to a puskesmas within a 10-minute walk radius (800 m).



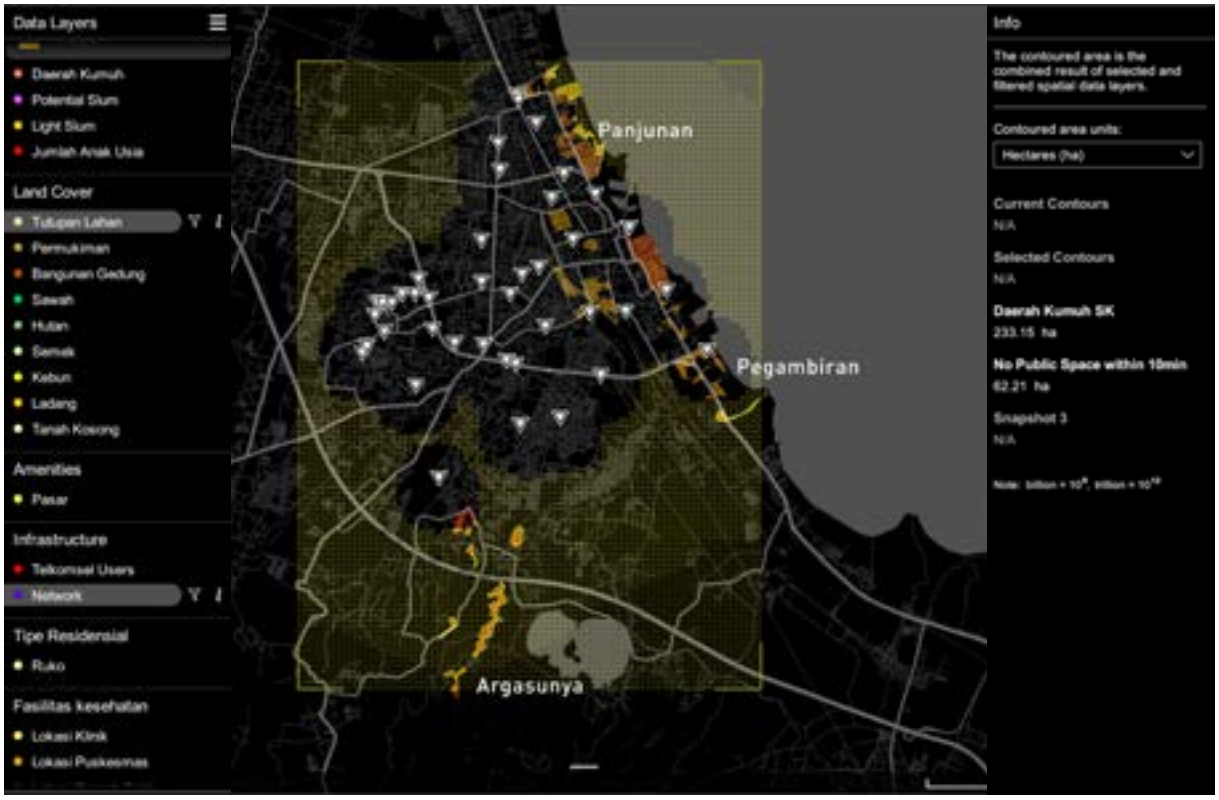
Appendix 4.5 Usage of Midwife Services in Slums
Approximately 59% of total slum area does not use midwife services.

Appendix 4.6 Access to Education for Low-Income Households (MBR) in Slums
Approximately 79% of slum areas with more than 50% of MBR households have children out of school.

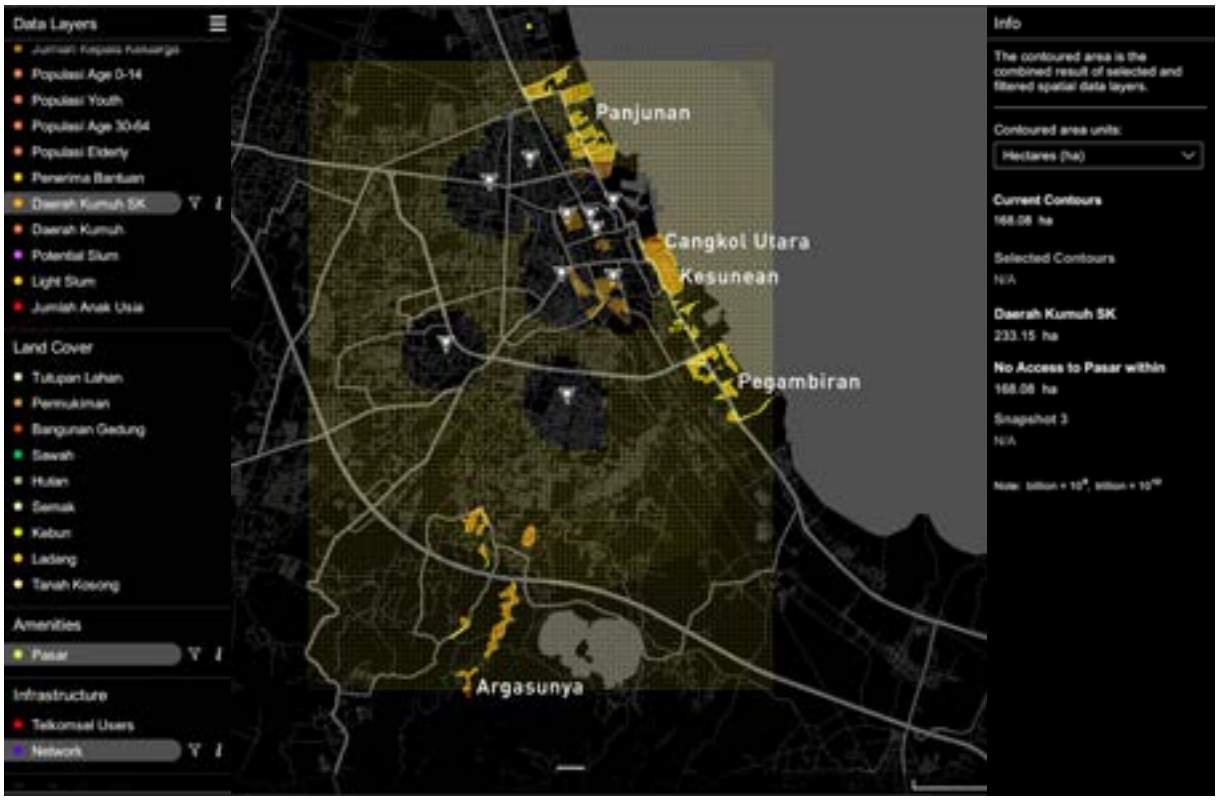


Appendix 4.7 Access to Primary Education in Slums
Approximately 11% of total slum area has no access to a kindergarten or elementary school

Appendix 4.8 Access to Secondary Education in Slums
Approximately 43% of total slum area has no access to a senior high school within a 10-minute walk radius (800 m).

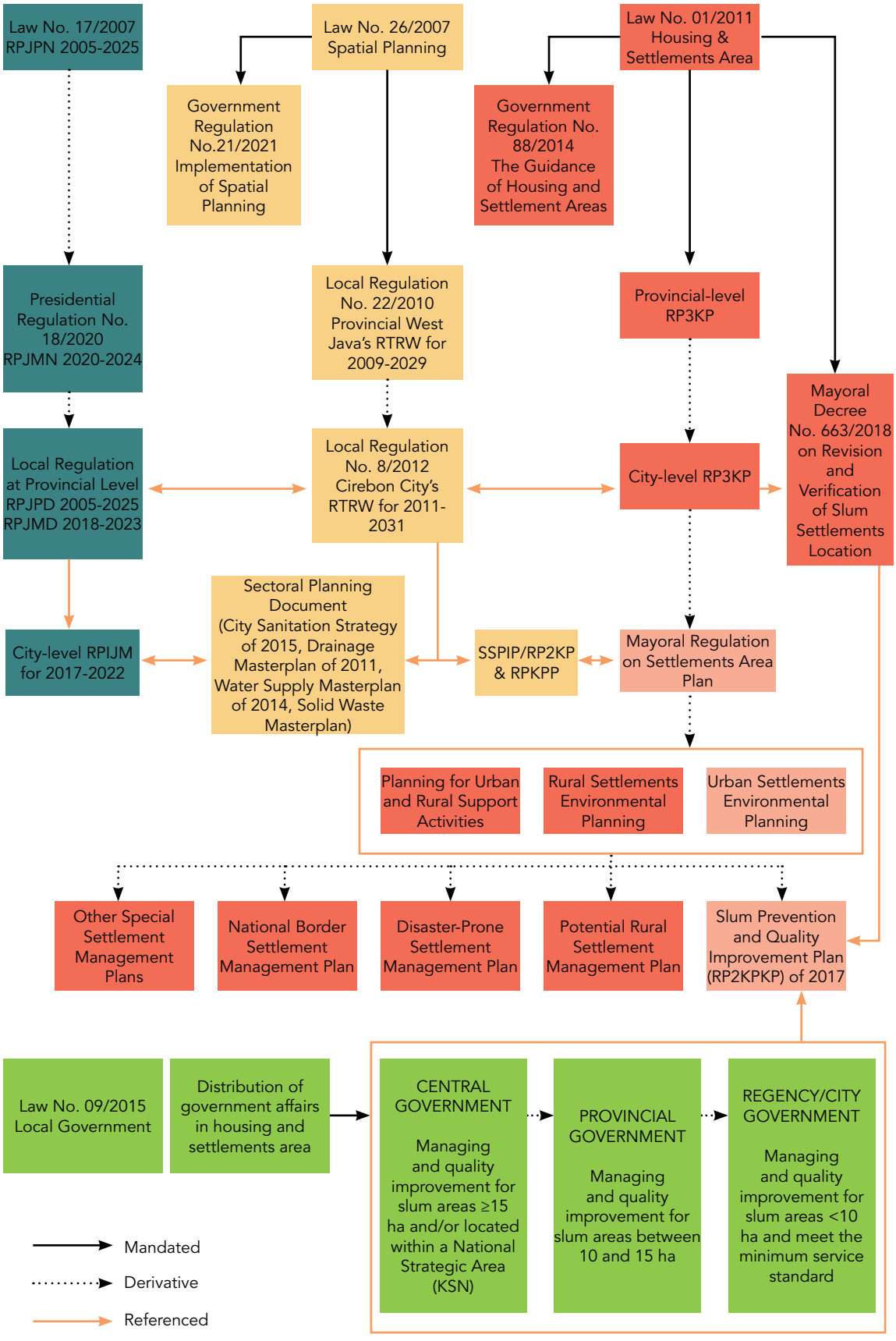


Appendix 4.9 Access to Public Green Open Space in Slums
Approximately 27% of total slum area has no access to a public park or sports facility within a 10-minute walk radius (800 m).



Appendix 4.10 Access to Food in Slums
Approximately 72% of total slum area has no access to a pasar within a 10-minute walk radius (800 m).

APPENDIX 5. CIREBON CITY URBAN POLICY AND PLANNING FRAMEWORK



Source: Authors

A street vendor sells traditional children's toys on Car Free Day in Cirebon City.
Asian Development Bank.

Prepared by :
Livable Settlements Investment Project Consultant Team

For :
Asian Development Bank