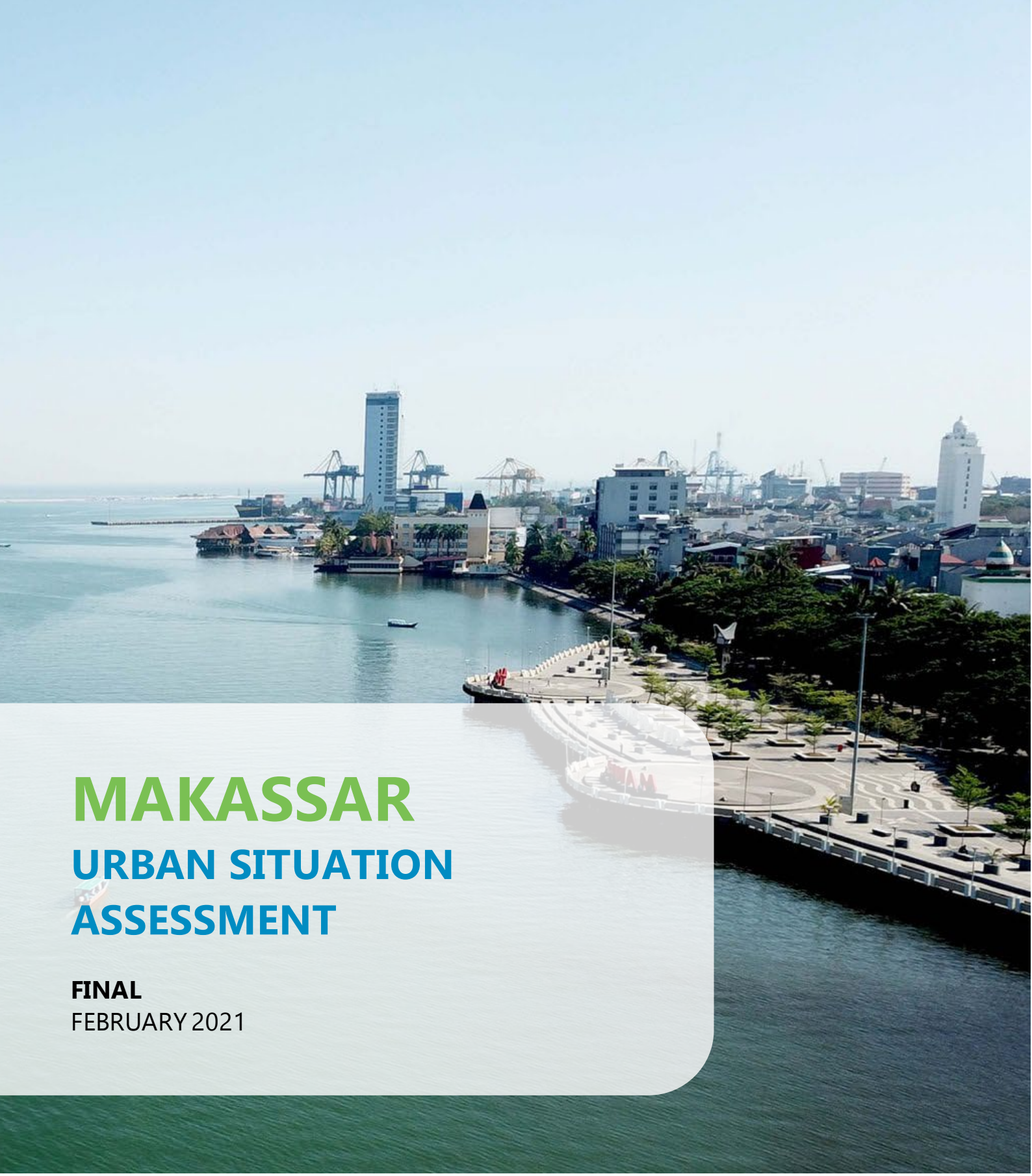

MAKASSAR
URBAN SITUATION ASSESSMENT

FINAL
FEBRUARY 2021

ASEAN AUSTRALIA SMART CITIES TRUST FUND
Asian Development Bank

Australian Government
Department of Foreign Affairs and Trade

ADB

Acknowledgement

The report has been prepared with the support of Asian Development Bank, the Australian Department of Foreign Affairs and Trade (DFAT) and the Makassar City Government (Pemkot Pemerintah Kota Makassar)

Ramboll
Level 3
100 Pacific Highway
PO Box 560
North Sydney
NSW 2060
Australia

T +61 2 9954 8100
F +61 2 9954 8150
https://ramboll.com

Project name	**Makassar Livable City Plan**
Recipient	**Asian Development Bank (DFAT and City of Makassar)**
Document type	**Final Situation Assessment Report**
Version	**2.0**
Date	**04/02/2020**
Prepared by	**Craig Niles**
Description	**Makassar Livable City Plan: Situation Assessment Report**
Cover image:	**Photo: Makassar City Waterfront** **Source: Unsplash**

Authors note: *This document is a draft report and will be further development with input from additional sources, including additional data and analysis of urban poor and slum upgrades.*

Ramboll Australia Pty Ltd.
ACN 095 437 442
ABN 49 095 437 442

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ABBREVIATIONS AND DEFINITIONS

AASCTF	ASEAN Australia Smart Cities Trust Fund
ADB	Asian Development Bank
APBD	Anggaran Pendapatan Belanja Daerah Regional Government Budget
APBN	Anggaran Pendapatan Belanja Nasional National Government Budget
ASCN	ASEAN Smart Cities Network
ASEAN	Association of Southeast Asian Nations
ASUS	ASEAN Sustainable Urbanization Strategy
BAPPEDA	Badan Perencanaan Pembangunan Daerah Regional Planning Development Agency
BAPPENAS	Badan Perencanaan Pembangunan Nasional National Planning Development Agency
BKPSDMD	Badan Kepegawaian dan Pengembangan Sumber Daya Manusia Daerah Local Office of Personnel and Human Resource Development
BNPB	Badan Nasional Penanggulangan Bencana National Board on Disaster Management
BPBD	Badan Penanggulangan Bencana Daerah Local Disaster Management Office
BPN	Badan Pertanahan Nasional National Land Agency
BPS	Badan Pusat Statistik Central Statistics Agency
BULOG	Badan Urusan Logistik Indonesian Bureau of Logistics
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
DFAT	Department of Foreign Affairs and Trade
DID	Dana Insentif Daerah Regional Incentive Funds
District	Lowest tier of autonomous government (Kabupaten)
Diskominfo	Dinas Komunikasi dan Informasi Communication and Information Office
DKPSD	Perbaikan Kinerja dan Tunjangan Kinerja Aparatus Sipil Negara Implementation of Performance Improvement and Government Apparatus Performance Allowance
DPR	Dewan Perwakilan Rakyat House of Representatives
DPRD	Dewan Perwakilan Rakyat Daerah Regional House(s) of Representatives
Dukcapil	Kependudukan dan Catatan Sipil Population and Civil Archieves
GCA	Government Contracting Agency
GESI	Gender Equality and Social Inclusion
GOI	Government of Indonesia
GR	Government Regulation
ICT	Information,Communication, and Technology
IPAL	Instalasi Pengolahan Air Limbah Communal waste water treatment
ISA	Information Security Assurance

ISPP	Pelaksanaan Integrasi Perencanaan dan Penganggaran Implementation of Planning and Budgeting Integration
IT	Information and Technology
Kecamatan	The 15 sub-districts of the City of Makassar
KEN	Komite Ekonomi Nasional National Economic Committee
KemenPAN	Kementerian Pendayagunaan Aparatur Negara dan Reformasi Birokrasi Ministry of State Apparatus and Bureaucracy Reform/MoSA-RB
KIN	Komite Inovasi Nasional National Innovation Committee
KOTAKU	Penataan Kota Tanpa Kumuh City without Slums
KUA-PPAS	Kebijakan Umum Anggaran-Platform Pagu Anggaran Sementara General Budget Policy-Temporary Budget Ceiling Priority
KRISNA	Perencanaan dan Informasi Kinerja Anggaran Data Center e-Government, Planning, and Information Performance Budget
MANTRA	Aplikasi Manajemen integrasi dan pertukaran data Management Integration and Data Exchange Application
MoF	Ministry of Finance Kementrian Keuangan
MoHA	Ministry of Home Affairs Kementerian Dalam Negeri
MoNE	Ministry of National Education Kementrian Pendidikan Nasional
MoSA BR	Ministry of State Apparatus and Bureaucracy Reform Kementrian Pendayagunaan Aparatur Negara dan Reformasi Birokrasi
Musrenbang	Musyawarah Rencana Pembangunan Community Consultation on Development Plan
MP3EI	Masterplan Percepatan Perluasan Pembangunan Ekonomi Indonesia Masterplan for Acceleration and Expansion of Economic Development of Indonesia
MSS	Minimum Service Standards Standar Pelayanan Minimum/SPM
NDC	Nationally Determined Contribution
NSPK	Norma Standar Prosedur dan Kritera Norm, Standard, Procedure, and Criteria
OPD	Organisasi Perangkat Daerah Personnel of Local Organization
PAMSIMAS	Penyediaan Air Minum dan Sanitasi Berbasis Masyarakat Community based drinking water and sanitation
PCM	Public Complaint Mechanism
PDAM	Perusahaan Daerah Air Minum Local Drinking Water Company
Progam PKT	Padat Karya Tunai Cash Labor Intensive Program
PLN	Perusahaan Listrik Negara State-owned Electric Company
PNS Mail	Pegawai Negeri Sipil Mail Civil Servant Mail
PNS Box	Private Network Security Box
PPP	Public Private Partnerships
PR	Presidential Regulation

PTSP	PelayananTerpadu SatuPintu One Stop Service
PUSDATIN	Pusat Data dan Informasi Pertanahan Center of Land Data and Information
RAPBD	Rencana Anggaran Pendapatan dan Belanja Daerah Regional Government Budget Plan
RANPRB	Rencana Aksi Nasional Pengurangan Resiko Bencana Disaster Management Plan
RDTR	Rencana Detail Tata Ruang Detailed Spatial Plan
Renstra KLHK	*Rencana Strategis Kementrian Lingkungan Hidup dan Kehutanan* Strategic Plan of Environment and Forestry
RIPPARDA	Rencana Induk Pembangunan Pariwisata Daerah Local Master Plan for Tourism Development
RIPPARNAS	Rencana Induk Pembangunan Pariwisata Nasional National Master Plan for Tourism Development
RISPAM	Rencana Induk Pengembangan Sistem Penyediaan Air Minum Masterplan on drinking water supply development system
RKP	Rencana Kerja Pemerintah Annual Development Plan
RKPD	Rencana Kerja Pemerintah Daerah Provincial/District Annual Development Plan
RKTN	Rencana Kehutanan Tingkat Nasional National Level Forestry Plan
RPB	Rencana Penanggulangan Bencana Disaster Prevention Plan
RPJM	Rencana Pembangunan Jangka Menengah Mid-Term Development Plan
RPJMD	Rencana Pembangunan Jangka Menengah Daerah Provincial/District Mid-Term Development Plan
RPJPD	Rencana Pembangunan Jangka Panjang Daerah Provincial/District Long-Term Development Plan
RPJMN	Rencana Pembangunan Jangka Menengah Nasional National Mid-Term Development Plan
RPJPN	Rencana Pembangunan Jangka Panjang Nasional National Long-Term Development Plan
RTBL	Rencana Tata Bangunan dan Lingkungan Environment and Building Plan
RTRW	Rencana Tata Ruang Wilayah Spatial Plan
RTRWP	Rencana Tata Ruang Wilayah Provinsi Regional Spatial Plan
SANIMAS	Sanitasi Berbasis Masyarakat Community based sanitation
SDA	Software-Defined Architecture
SDGs	Sustainable Development Goals
Sekda	Sekretaris Daerah Regional Secretary
SIAK	Sistem Informasi Administrasi Kependudukan Population Administration Information System
SIAP	*Sistem* Informasi Administrasi Presensi

	Attendance Administration Information System
SIKAMASETA	Sistem Informasi Kepedulian Masyarakat Miskin Elektronik Data Electronic Data Information System on Poor Community) and
SIMATA	Sistem Informasi Managemen Aset Pertanahan Land Asset Management Information System
siMAYA	Administrasi Perkantoran Office Administration MAYA
SIMPEG	Sistem Informasi Pegawai Personnel Information System
SIMTANAS	Sistem informasi Managemen Pertanahan Nasional National Land Management Information System
SIPPD	Sistem Informasi Perencanaan Pembangunan Daerah
SKM Plus	Survey Kepuasan Masyarakat
SKPD	Satuan Kerja Perangkat Daerah Local Government Work Unit
SPAM	Sistem Penyediaan Air Minum Supply of drinking water system
TOD	Transit oriented development
TORA	Tanah Obyek Reforma Agraria Land Objects for Agrarian Reform
TPS 3R	Tempat Pengelolaan Sampah Reuse Reduce Recycle Solid waste management with reduce, reuse, recycle concept
UN	United Nations
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
UNDP	United Nations Development Programme
UUPA	Undang-Undang Pokok Agraria Principles of Agraria

1. INTRODUCTION

1.1 DOCUMENT PURPOSE

The purpose of this document is to develop a holistic understanding of the existing urban environment and population of the City of Makassar. The Situation Assessment is part one of a suite of documents that will work towards creating a more livable City of Makassar for all residents, workers and visitors.

The Situation Assessment is the first step towards a smart and livable city framework: **Makassar Livable City Plan**.

1. Urban Situation Assessment

Identification of key baseline data and rapid needs assessment of current conditions in Makassar

2. Urban Scenario Report

Review of existing plans and projections for city development and assessment of future demands (physical, demographic and financial) for planning, financing and service delivery

3. Makassar Livable City Plan

Strategic urban framework to guide future City development and prioritisation of interventions to improve planning, service delivery and financing

1.2 ABOUT THE ASEAN AUSTRALIA SMART CITY TRUST FUND

The ASEAN Australia Smart Cities Trust Fund (AASCTF) assists ASEAN cities in enhancing their planning systems, service delivery, and financial management by developing and testing appropriate digital urban solutions and systems. By working with cities, AASCTF facilitates their transformation to become more livable, resilient, and inclusive, while in the process identifying scalable best and next practices to be replicated across cities in Asia and the Pacific.

1.3 MAKASSAR LIVABLE CITY PLAN

1.3.1 Need for a holistic plan

Makassar has detailed expansion and development plans for its public services including: a comprehensive land use plan; a long-term and a medium-term development plan and a smart city strategy. However, these plans are becoming outdated owing to higher-than-expected population growth, climate change impacts and new technological solutions. Based on our review of the current situation, Makassar would benefit from a new city wide framework which addresses the many sector-specific measures that are taking place to deal with the rapid growth of the city, while simultaneously aligning it with the latest smart technological solutions and addressing the negative implications of climate change. Based on a holistic review of cross-cutting themes, priorities would be identified for smart and livable city interventions.

The Makassar Livable City Plan (MLCP) is not a spatial plan, it is designed as a framework that adapts current spatial plans and major initiatives (**Sombere and Smart City**) to produce a framework that integrates strategies for smart and sustainable development, including : governance, development, infrastructure, culture, community programs, resilience and economic mechanisms. This framework articulates community aspirations and adapts various potential interventions towards a Smart and Livable Makassar.

Figure 1: Benefits to Makassar from a holistic plan

1.3.2 MLCP Approach

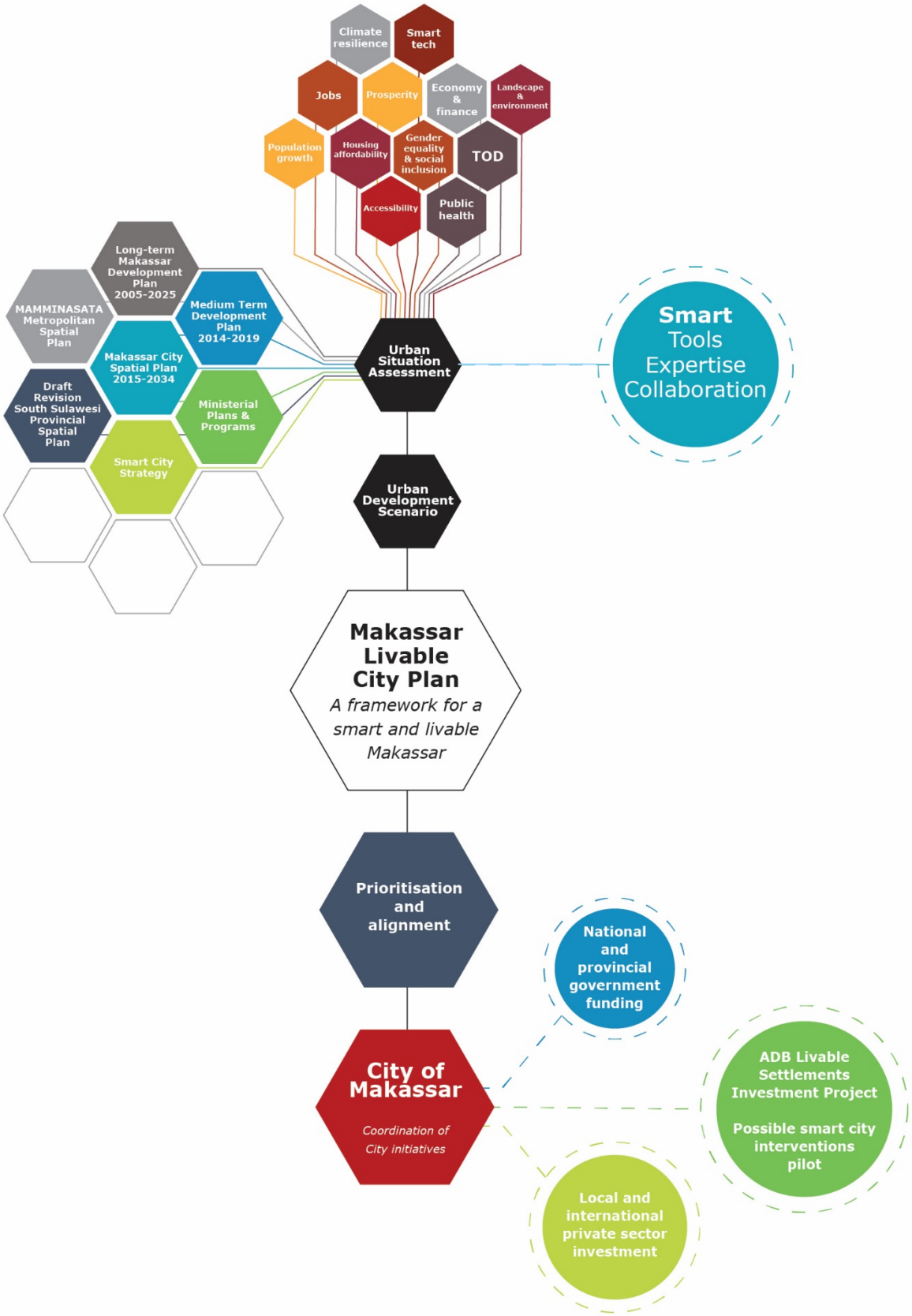
The MLCP will deliver the following key elements to support a smart and livable Makassar:

- Establish a strategic urban framework integrating existing smart city plans, actions and initiatives under a holistic framework
- Produce a refined, integrated vision for smart and livable Makassar
- Elaborate a smart and collaborative approach
- Investigate various policy mechanisms to achieve the required outcomes
- Prioritise cross-sector projects and identifying potential transformation projects. Promote synergy and multi-function across programs
- Establish digital instruments for planning, service delivery and finance
- Identify a road map (implementation plan) for effective implementation and institutions
- Prioritisation of smart digital and livability solutions to be funded in Makassar.

MLCP will generate priorities for various initiatives based on focus areas from across sectors and departments. The MLCP framework will support Makassar City to implement outcomes and secure funds from various sources, including with the National and Provincial governments, through ADB and local investment as well as various potential international organizations.

THE MLCP approach (key steps) are illustrated in Figure 3, which also shows the implementation phase and links to potential investment and funding sources.

Figure 2: Approach to preparation of the MLCP



1.3.3 Aim of the Livable City Plan

The MLCP aims to deliver the following three outputs for the City of Makassar:

- **Output 1: Improved planning systems in Makassar**. The project will identify and develop a future smart and livable city plan which will act as a strategic framework of outlining digital solutions to be piloted in the city toward achieving the same "smart and livable city" vision. The strategic framework will be the tool to develop a list of prioritized projects across sectors, creating clarity on the succession of investments to secure synergy and multi-functionality where possible.
- **Output 2. Improved service delivery in Makassar**. The project will include an institutional and infrastructure analysis and forecasts which will examine each service sector including all urban services. Selected investments identified might be covered by ADB's envisioned Livable Settlements Investment Loan which has a focus on improving access to basic services in informal settlements.
- **Output 3. Improved financial management in Makassar**. The project will include an institutional and infrastructure analysis and forecasts, including financial and economic analysis.

1.4 STRUCTURE OF REPORT

Aligned with the PESTLE framework, the Situation Assessment describes the existing conditions of Makassar with respect to the four main dimensions of the ADB Livable City Analysis Framework (Figure 4):

- **Built capital**: Investments or policies that support physical infrastructure of cities
- **Human Capital**: Investments or policies that support individual well-being of city residents
- **Natural Capital**: Investments or policies that support natural ecosystems of and around cities
- **Social Capital**: Investments or policies that support societal fabric of cities.

Figure 3: ADB Livable City Analysis Framework

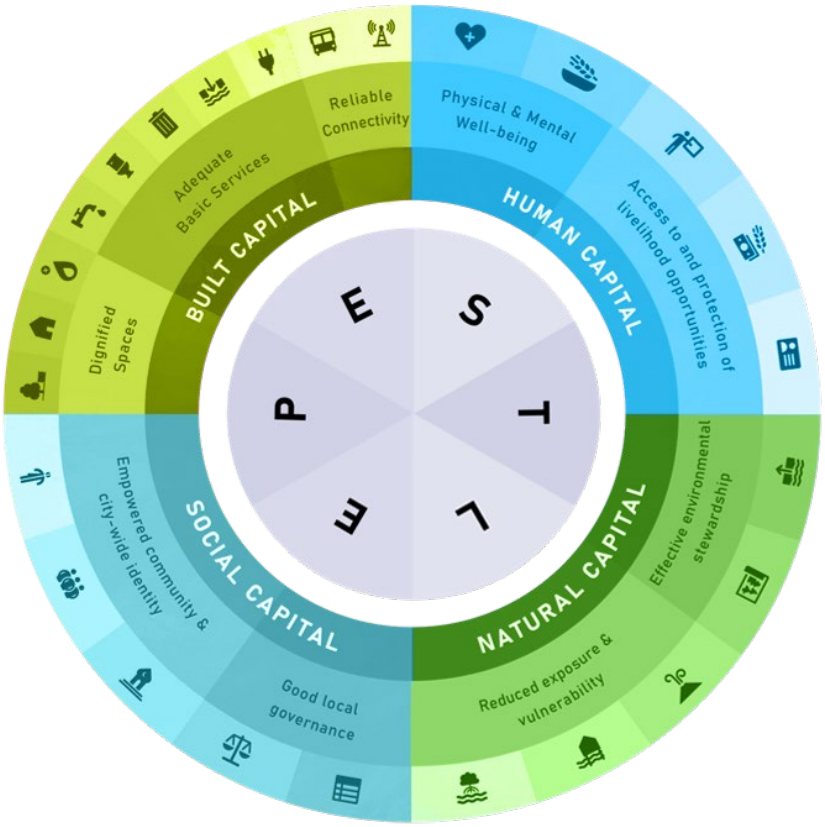


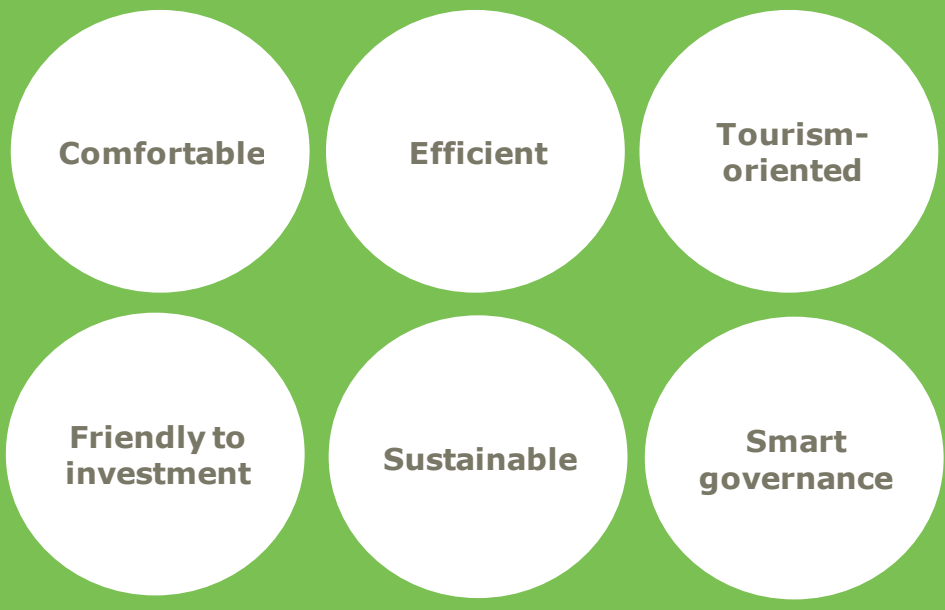
Figure 4: Dimensions of the PESTLE framework

The structure of the Situation Assessment Report aligns with the PESTLE framework, with additional criteria adapted that reflect a city-wide assessment as described in Table 1 below.

Table 1: Structure of Situation Assessment (alignment with PESTLE framework)

PESTLE			MAKASSAR REPORT TEMPLATE	
Dimensions	**Goals**	**Solutions (Indicators)**	**Section**	**Report volume**
Built Capital: Investments or policies that support physical infrastructure of cities	Goal 1. Dignified spaces	Inclusive and usable public spaces	Public space	1. Urban development
		Affordable housing	Housing & shelter	
		Fire-safe buildings		
	Goal 2. Adequate basic services	Clean drinking water	Water supply	2. Water supply
		Effective sanitation	Sanitation	3. Sanitation
		Effective solid waste management	Solid waste management	4. Solid waste management
		Effective drainage systems	Stormwater drainage	5. Stormwater drainage
		Affordable energy supply	Electricity / energy	7. Environment, land management and energy
	Goal 3. Reliable connectivity	Multimodal urban mobility	Urban mobility	11. Urban mobility
		Adequate digital penetration	Digital penetration	12. Smart infrastructure
Human Capital: Investments or policies that support individual well-being of city residents	Goal 4. Physical and Mental Well-being	Affordable general healthcare	Health sector / health & services	6. Social and GESI
			Food supply / security	
	Goal 5. Access to and Protection of Livelihood Opportunities	Access to general education	General education	
		Enterprise Skills training and Development	Enterprise and livelihood	
		Social protection and safety nets	Social protection	
Natural Capital: Investments or policies that support natural ecosystems of and around cities	Goal 6. Effective Environmental Stewardship	Land-use Planning	Land management	7. Environment, land management and energy
				1. Urban development
		Water and natural resources management	Water and natural resources management	7. Environment, land management and energy
	Goal 7. Reduced Exposure and Vulnerability	Ecosystem based tourism and development	Tourism	10. Tourism
				7. Environment, land management and energy
		Disaster Risk Management	Disaster risk management	13. Climate change and natural hazards
			Climate change and natural hazards	
Social Capital: Investments or policies that support societal fabric of cities	Goal 8. Good Local Governance	Transparent public management and rule of law	Institutional management and rule of law	8. Urban Governance
		Targeted economic development strategy	Tourism in Makassar	10. Tourism
			Digital economy	9. Financial sustainability and economic development
			Investment attraction (Friendly to investment)	
		Inclusive and transparent financial sustainability	Financial sustainability	
		Integrated data and mapping	Digital penetration	12. Smart infrastructure
	Goal 9. Empowered Community and City-wide Identity	Gender and minority group inclusion	Gender, youth and inclusion	6. Social and GESI
		Participatory planning processes	Citizen engagement / community empowerment processes	
		Cultural heritage and historic preservation	City-wide identity and cultural heritage	4. Environment, land management and energy

Vision for Makassar City



2. MAKASSAR CITY VISION

2.1.1 Initial vision

The **Smart, Livable, Sustainable** vision for Makassar City will be subject to refinement as further analysis and collaboration with key stakeholders is carried out, with a final vision to be included in the Makassar Livable City Plan.

Makassar City Visions

2005-2025 - "Makassar as a Maritime City, Global Oriented Commerce, Education, Culture and Services, Environmentally Friendly and Most Friendly"

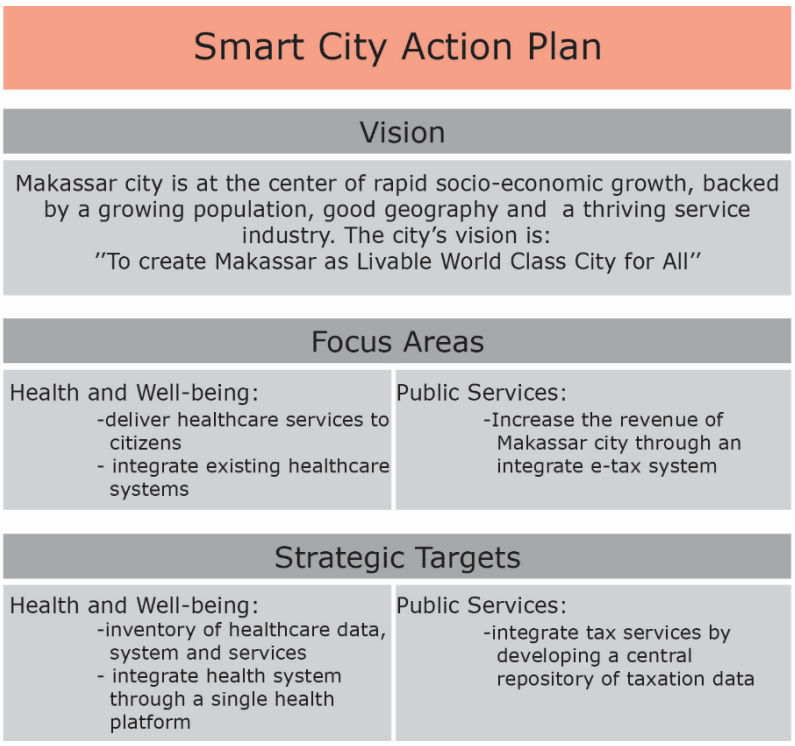
2014-2019 - "Makassar, a World City that is Comfortable for everybody"

2019-2025 – "To create Makassar as a livable world class city for all"

2.1.2 ASEAN Smart Cities Network

Makassar is one of the pilot cities included in the ASEAN Smart Cities Network (ASCN) initiative proposed by Singapore during the 32nd ASEAN Summit, which took place in May 2018. The Smart City Action plan for Makassar developed during the ASCN workshop has a clear vision aligned with the Makassar Smart City Framework.

Figure 5: Makassar ASCN Smart City Action Plan (2018) [1]



[1] Source: https://asean.org/storage/2020/01/ascn/Makassar.pdf [Accessed 18-12-2020]

2.1.3 Makassar Smart 'War Room'

Makassar initiated, in 2014, in collaboration with IBM, a smart city operations centre called 'The War Room' as part of the smart city strategy with the objective of initiating a 'war' against Makassar's problems. Real-time data from a variety of data collection systems are collected and displayed on large monitors named The War Room Dashboard. Data are retrieved from transportation, road safety measures, other related safety measures like CCTV, from public and government services such as the home care health vans. [2]

While the War Room was one of the first smart city initiatives under the Makassar Smart Cities Framework, more than 100 other initiatives have been initiated in Makassar. [3]

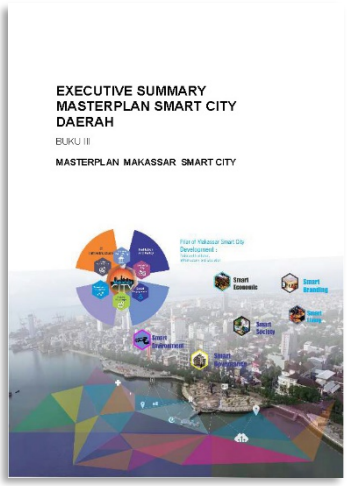
Figure 6: Makassar Smart City Program and amount of smart initiatives under each program [4]

Component	Smart Governance	Smart Branding	Smart Economic	Smart Living	Smart Society	Smart Environment
Program	Tata Kelolah IT Governance	Branding City		Economic Transformation		
	Livable World City	Public Engagement		Environment Protection		
Smart Innovation Projects	Tata Kelolah IT Governance: 26	Branding City: 11		Economic Transformation: 18		
	Livable World City: 22	Public Engagement: 29		Environment Protection: 24		

[2] USAID and JSI, Building Healthy Cities – Makassar Data Use and Access Assessment (2019)
[3] Masterplan Makassar Smart City Baku III, Executive Summary Masterplan Smart City Daerah, KomInfo Makassar
[4] Masterplan Makassar Smart City Baku III, Executive Summary Masterplan Smart City Daerah, KomInfo Makassar

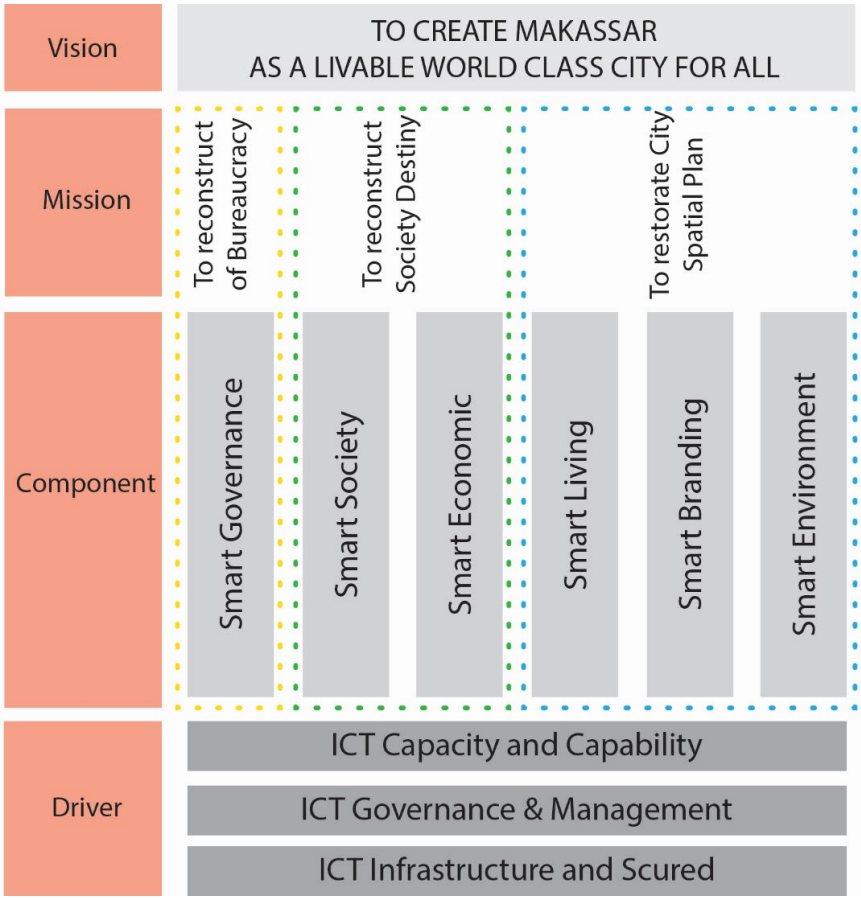
2.1.4 Makassar Smart City Program

The Makassar Smart City Program [Program Smart City Kota Makassar] started in 2015 with the objective of promoting a vision for Makassar Smart City, delivering improved quality of life for its citizens through infrastructure, a clean and sustainable environment, and the application of smart solutions, including ICT. A smart city framework (see Figure 8) was developed including an overarching vision, a three-tiered mission, six key components and three drivers as cross-cutting enablers.



The current Masterplan Makassar Smart City – Buku III [5] provides a framework for the future of Makassar as a smart city (Figure 8).

Figure 7: Makassar Smart City Plan Framework[6]



[5] KomInfo Makassar, 2019

[6] Masterplan Makassar Smart City Baku III, Executive Summary Masterplan Smart City Daerah, KomInfo Makassar

Under the vision for a "Sombere [kind hearted] and Smart City", the Smart vision for Makassar combines technology and local wisdom to offer a sociotechnical solution to the city's development and structural problems.[7] 'Sombere' is interpreted as heartware and 'smart city' is interpreted as hardware and software. In this context, the vision for a smart Makassar City uniquely combines cultural values and application of technology[8]. The Makassar smart city concept is based on *"not only defined in the use of information and technology tools but also the use of information and technology artifacts in the wider social and organizational context"* [9].

Figure 8: Makassar Sombere and Smart City [10]

[7] CIO Australia https://www.cio.com/article/3322917/smart-city-profile-makassar.html

[8] Advances in Economics, Business and Management Research (AEBMR), volume 43 International Conference on Administrative Science (ICAS 2017) *Concept of Smart City Governance in Makassar City*, Muhlis Madani and Nasrulhaq, 2017

[9] Advances in Economics, Business and Management Research (AEBMR), volume 43 International Conference on Administrative Science (ICAS 2017) *Concept of Smart City Governance in Makassar City*, Muhlis Madani and Nasrulhaq, 2017

[10] http://world-cities.eu/wp-content/uploads/2017/06/Makassar-BAHAN-KOMISI-EROPA.pdf

2.1.5 Makassar Smart City Beyond 2020

KomInfo has recently developed an ambitious roadmap for the next batch of smart city initiatives in the city's smart city program. This roadmap is focusing on smart and digital technologies and reflects the vision on implementing new technologies to enhance the sectors of healthcare, security and mobility beyond 2020. [11]

Many smart and digital solutions have been identified relating to a range of enabling ICTs such as: 5G, analytics, broadband access, cloud, data management, sensors and controls, privacy and security.

Figure 9: Mayor of Makassar speech, September 2019 [12]

Mayor of Makassar, September 2019

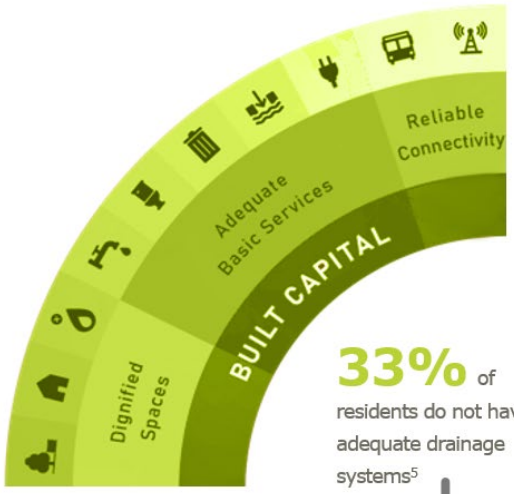
"Developing smart cities in Makassar is not by making IT and technology solutions the ultimate goal –but rather focusing on innovation and breakthroughs to solve priority problems and or develop regional leading sectors, based on integrated, and collaborative sectors between sectors. And of course, simultaneous smart city-based development should be able to produce smart people and smart society"

[11] KomInfo Kota Makassar, Plan for Makassar Smart City beyond 2020 (2020)

[12] Masterplan Makassar Smart City Baku III, Executive Summary Masterplan Smart City Daerah, DisKomInfo Makassar

3. OVERVIEW OF MAKASSAR

3.1 MAKASSAR SNAPSHOT



67% of housing growth in last 10 years occurred in slum areas[3]

4% of households in Makassar do not have wastewater facilities and infrastructure[5]

Green open space occupies **8.3%** of total area[1]

62% of residents have access to drinking water from mains water supply[4]

5% of existing solid waste management services are self-managed by the community or underserved[5]

33% of residents do not have adequate drainage systems[5]

61% of residents report that public transport is satisfactory[2]

68% of residents report that internet speed and reliability meets their needs[2]

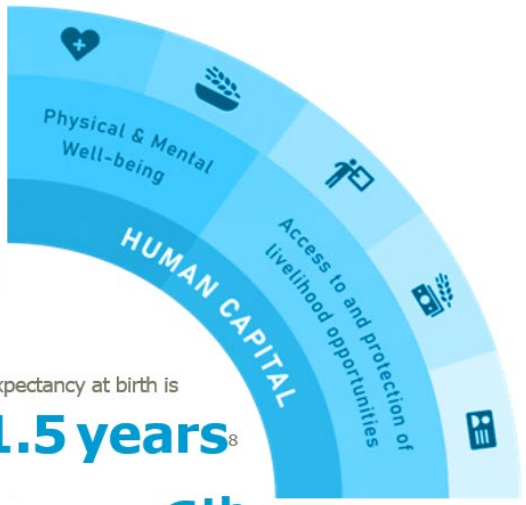
57.5% of renters report being at risk of rental poverty[2]

Working population (2019) is **592,517**[6]

Unemployment rate (2020) is **15.92%**[7]

57% of GDP is derived from manufacturing, construction and trade[7]

Residents have an average of **8 years** of schooling[2]



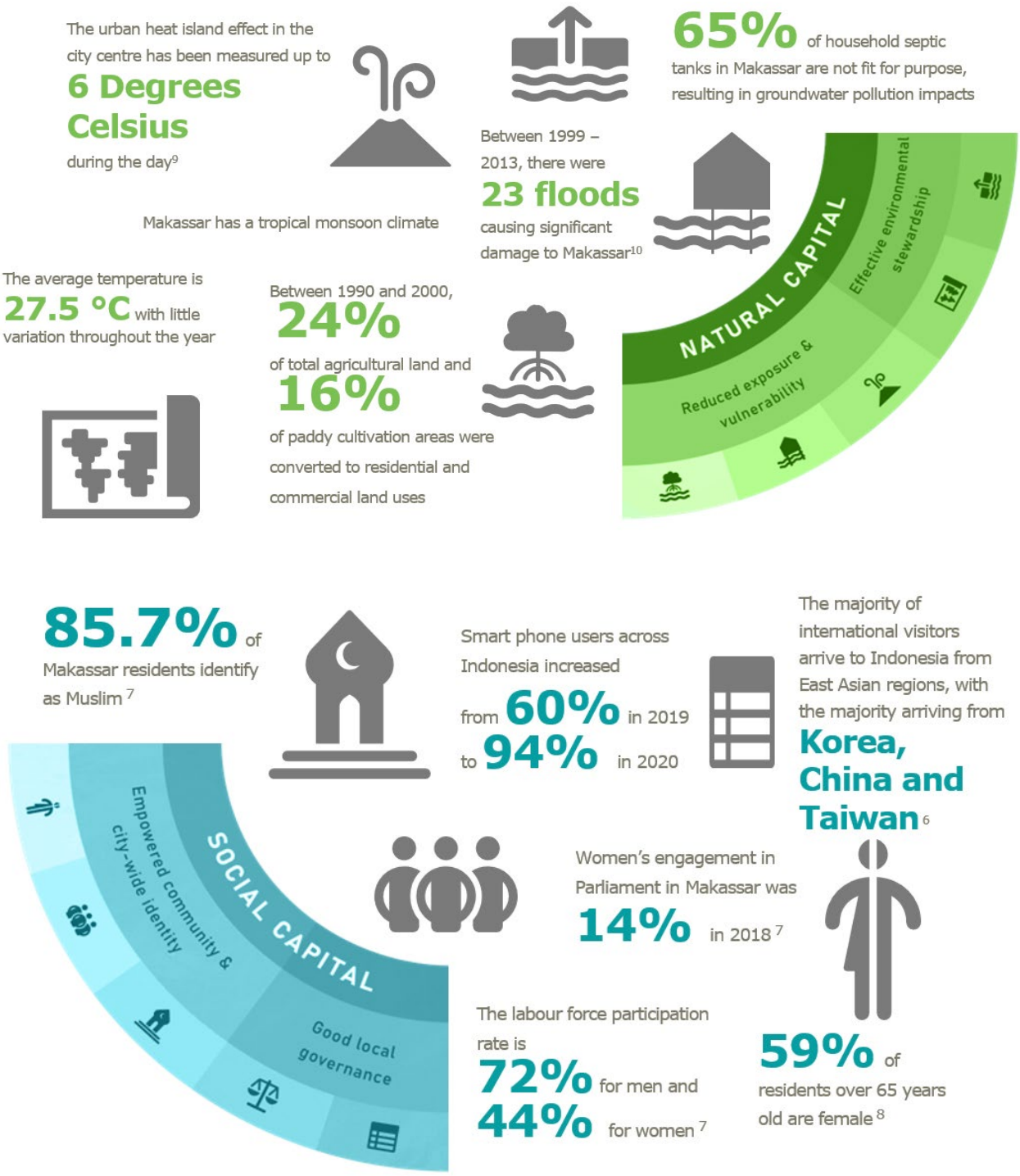
Forecast population (2040) is **1,932,000**

Life expectancy at birth is **71.5 years**[8]

Current population (2019) is **1,526,677**[6]

Makassar is the **6th** largest city in Indonesia and the **capital** of South Sulawesi

1. Perda RTRW Makassar 2015-2034
2. IMD World Competitiveness Center's Smart City Observatory
3. Environmental Pollution Control and Sustainability Management of Slum Settlements in Makassar City (2019)
4. CSIRO (2015)
5. Makassar Sanitation Strategy 2018-2022
6. BPS 2019
7. BPS 2020
8. BPS 2010



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4. CSIRO (2015)
5. Makassar Sanitation Strategy 2018-2022
6. BPS 2019
7. BPS 2020
8. BPS 2010
9. Maru, Invanna & Rasyid (2015)
10. Kota Kita (2013)

Figure 10: Makassar locality plan

3.2 KEY FEATURES

3.2.1 Geography

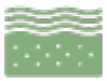
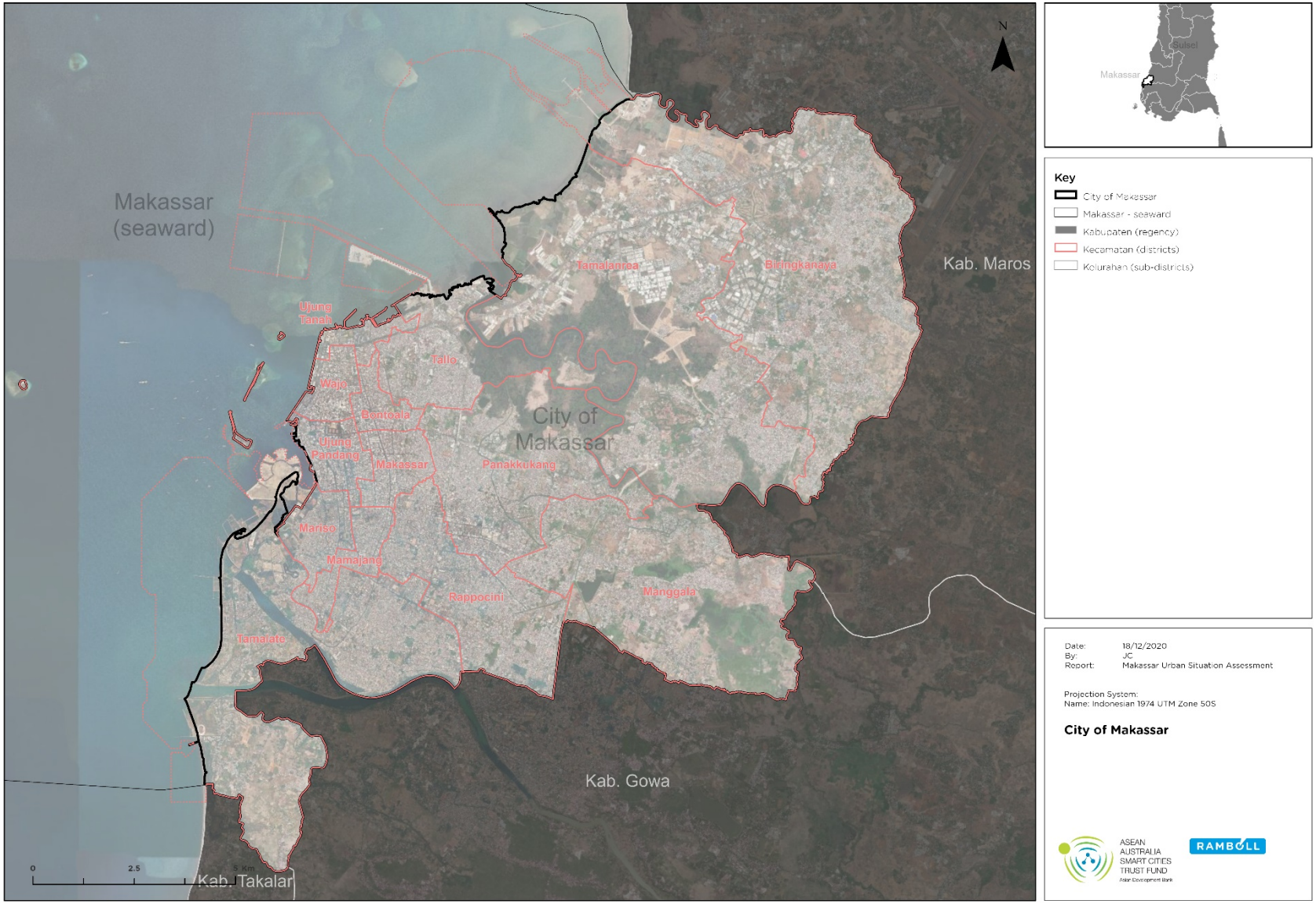
	Region: West coast of South Sulawesi
	Global position: Makassar is located between 119018'28"-119032'31" longitude east and 5030'30"-5 14'49" South latitude
	Local: Makassar is a coastal city, located at the foot of the Mount Bawakaraeng to the east and the Makassar Strait to the west
	Terrain: Makassar is relatively flat, it is mostly lowland terrain • Western Makassar: average elevation above sea level of 0 metres to 5 metres • East and north Makassar: average elevation above sea level of 5 metres to 25 metres.
	Hydrology: Makassar lies at the base of the vast Jeneberang watershed with three main rivers that influence the city's catchment: • Maros River in the north • Tallo River in central Makassar • Jeneberang River in the south
	Coastal ecosystem: Makassar has different types of natural ecosystems (e.g. mangrove ecosystems, coral reefs and seagrass beds)
	Climate: Makassar has a tropical monsoon climate
	Temperature: The average temperature for the year is 27.5 °C, with little variation due to its near-equatorial latitude. The year-round average high temperature is approximately 32.5 °C and the average low temperature is approximately 22.5 °C.
	Rainfall: Makassar averages around 3,137 mm of rain per year • November to April: 2,715 mm • May to October: 422 mm • August: negligible rainfall

Figure 11: Makassar City study area

Figure 12: Makassar City land boundaries



3.2.2 Population density

Makassar has 175,77 km^2 which include 15 Kecamatan (sub-districts) and Makassar population density has increased 16,6% from 7.200 people/km^{2}in 2010 to 8.422,83 people/km^2 based on 2019 population of 1,480,480 (Makassar Municipality in Figures, 2020). Makassar became the most populous city in eastern Indonesia (Bahru, 2013).

Makassar city population density in 2019 around 8,686 people / km^2. Makassar Kecamatan has the highest population density of 33,935 people / km^2, while Tamalanrea Kecamatan has the lowest population density of approximately 3,638 people / km^2.

Table 2: Makassar City Population Density by kecamatan (persons/km^2) [13]

KECAMATAN	AREA (KM2)	POPULATION	DENSITY (PEOPLE/KM2)
Biringkanaya	48.22	220,456	4,572
Bontoala	2.1	57,197	27,237
Makassar	2.52	85,515	33,935
Mamajang	2.25	61,452	27,312
Manggala	24.14	149,487	6,193
Mariso	1.82	60,499	33,241
Panakukkang	17.05	149,664	8,778
Rappocini	9.23	170,121	18,431
Sangkarang	1.54	14,531	9,436
Stem	5.83	140,330	24,070
Tamalanrea	31.84	115,843	3,638
Tamalate	20.21	205,541	10,170
Ujungpandang	2.63	29,054	11,047
UjungTanah	4.4	35,534	8,076
Wajo	1.99	31,453	15,806
Total	**175.77**	**1,526,677**	**8,686**

Figure 13 maps the current (2019) population density for each Kecamatan within Makassar. Figure 15 shows the change in population forecast for each Kecamatan for 2019 and 2040.

[13] Source: Makassar City in 2020 Figures

Figure 13: Population Density by Kecamatan, 2019

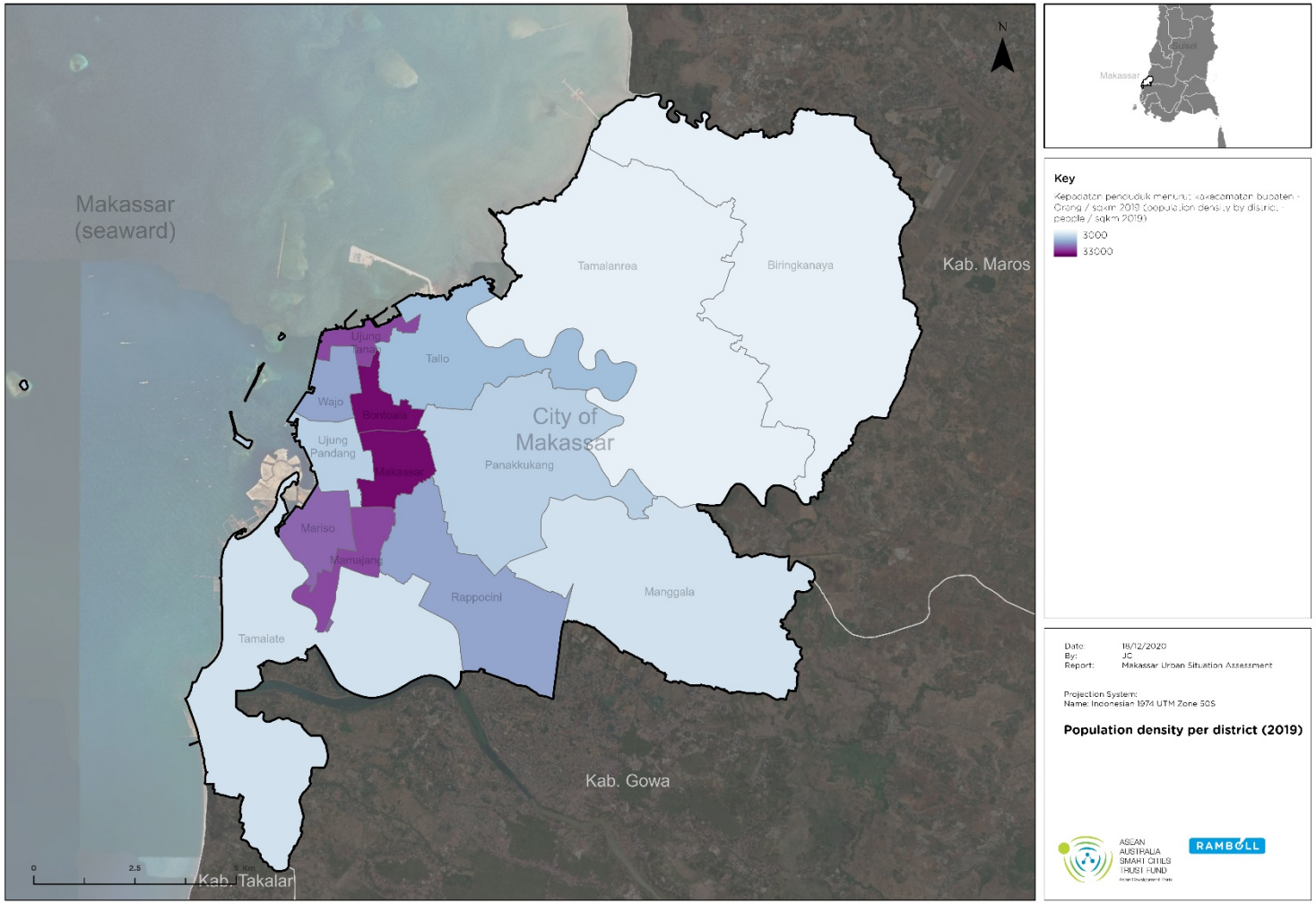
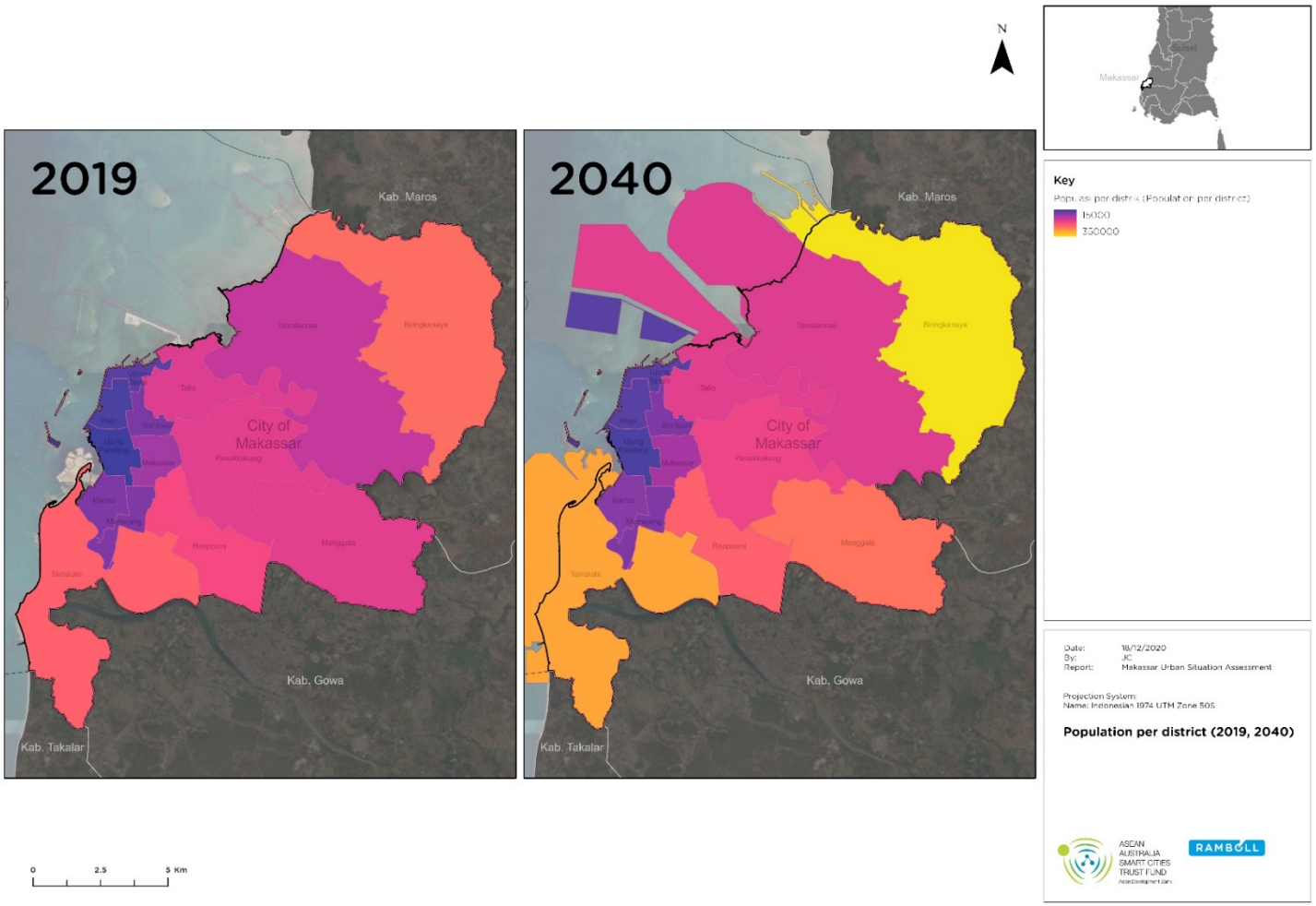


Figure 14: Population per Kecamatan (2019 and 2040)



3.2.3 Urban land uses

Existing land use based on RTRW thematic data of Makassar City 2015 is dominated by residential land use of 6,674.44 ha or 37.97% of the total area of Makassar city. In addition, there are several other productive land uses such as education, offices and commercial. The rise and mobility of urban areas is dominated by the function of the land use. External mobility between Kecamatan around the city of Makassar is dominated by destinations in primary activities such as trade/service activities and industry, especially during peak hours while internal movements within the city from sub-cities to the city centre are dominated by motivational activities to work, shop or go to school.

Table 3: Makassar land use by area [14]

EXISTING LAND USE	EXTENSIVE (HA)	PERCENTAGE (%)
Mangrove	471.69	2.68
Lake	84.95	0.48
Forest City	44.52	0.25
Industry	621.70	3.54
Mixed Garden	1,444.19	8.22
Outdoor	3.07	0.02
Commercial	308.12	1.75
Fields	110.54	0.63
Vacant Land	528.94	3.01
Sport Field	139.16	0.79
Tomb	64.89	0.37
Median	0.39	0.00
Sand	116.11	0.66
Port	93.32	0.53
Education	182.90	1.04
Office	5.81	0.03
Settlements	6,674.44	37.97
Swamp	382.74	2.18
Rice fields	2032.98	11.57
Rice Field Irrigation	764.71	4.35
Bushland	476.58	2.71
River	550.87	3.13
Garden	109.11	0.62
Pond	2,353.32	13.39
TPA	13.66	0.08
Total	**17,578.68**	**100.00**

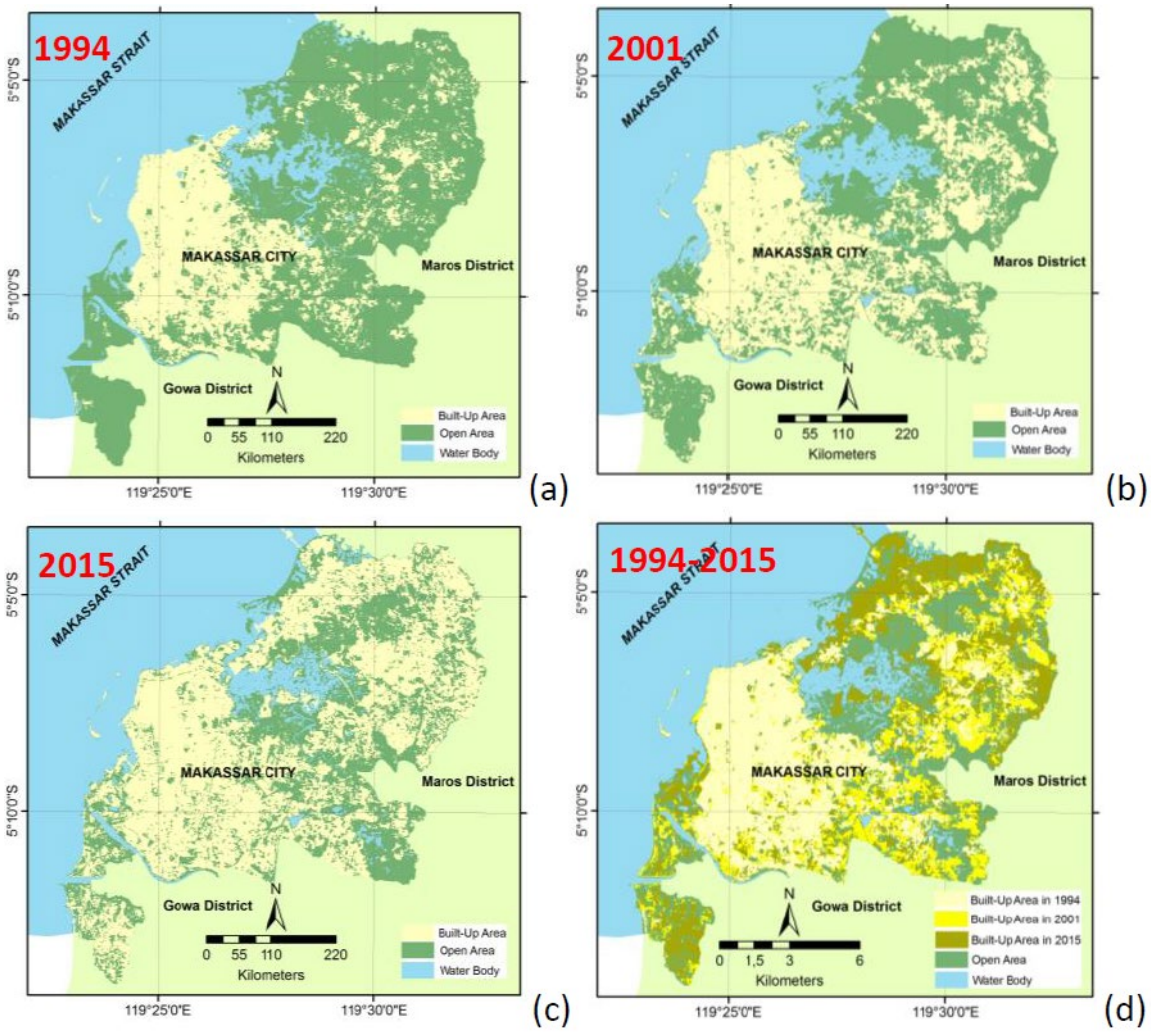
Urban segregation is an inherent feature of cities and becomes a problem when it excludes certain groups from accessing services, activities and spaces. The dynamics of the growth of Makassar City and its relationship to the allocation of space being developed shows symptoms of spatial segregation based on the socio-economic strata of the community (Suraya et al., 2020).

[14] Source: RTRW Makassar city 2015

3.2.4 Urbanisation

Figure 17 shows the changes of land use from 1994, 2001, to 2015. In 1994, the built-up area in Makassar City was predominantly located in the city center and the old town, especially in the coastal area of Losari. The development of built-up area in 2011 began to spread to the east direction of the Makassar City borders with Maros Kecamatan also spread to the south of the City borders with Gowa regency. Until in 2015, the built-up area in Makassar City has increasingly developed throughout the Makassar City, with the changes of open space become built up area significantly since 1994, 2001, until 2015 as can be seen in the north direction of the city, such as Biringkanaya Kecamatan, and west direction of the city, such as Tamalate Kecamatan. Development of the built-up area occurs linearly following the road network, for example in the eastern direction of the city, the built-up land occurs around Perintis Kemerdekaan road, in the north direction, the development occurs following the Toll road, and in the west direction, development of built-up area occurs after the development of Metro Tanjung Bunga Road.

Figure 15: The land use of Makassar City in 1994 (a), 2001 (b), 2015 (c), and the trend of the land use in 1994 to 2015 (d) [15]



In 1994, the amount of open area in Makassar City was twice the size of built-up area, with an open land area of 11,570 hectares, a built-up land area of 3,791 hectares and water bodies

[15] Amri et al., 2017

covering 98,260 hectares. The area of built-up land in 2001 increased to 6,478 Ha or 71% compared to 1994, while open land decreased to 8,738 Ha or -24%. The area of water bodies also reduced to 98,190 (70 Ha reduction). In 2015, the built land of Makassar City increased to be wider than the existing open land, with an area of 9,839 Ha, an increase of 51% from 2001 while the open land area was 6,396 Ha or decreased by 27%. From year to year, there has been a reduction in the area of open land due to the conversion of open area into built-up land - shown in Figure 15 above. It is projected that in 2031 the area of built land will increase to 11,600 Ha, while the open land will decrease to 5,564 Ha.

Table 2: The land use cover change (LUCC) of Makassar City in 1994 to 2015 and spatial projection in 2031 [16]

YEAR	BUILT-UP AREA (HA)	OPEN AREA (HA)	WATER BODY (HA)
1994	3.791	11.570	98.260
2001	6.478	8.738	98.190
2015	9.839	6.396	97.740
2031	11.600	5.654	97.290

Table 3: Comparison of population and built-up area in 2015 and projection in 2031 in Makassar City [17]

YEAR	LAND USE AREA				POPULATION	ECONOMIC GROWTH (MILLION)
	OPEN SPACE (HA)	%	BUILT-UP AREA (HA)	%		
2015	7.682,40	44,99	9.392,49	55,01	1.547.941	88.740.213,15
2031	5.611,75	32.73	11.531,36	67,27	2.060.309	1.159.463.308

Rapid urbanisation without appropriate land use controls has a positive contribution to the decline in environmental quality (e.g. air pollution) [18]. Makassar has undergone rapid expansions into the surrounding vicinity especially to the southern, eastern and northern directions including the conversion of Jeneberang delta, which was predominantly wetlands and agricultural area, into a large built-up area [19].

[16] Amri et al., 2017
[17] Amri et al., 2017
[18] Al Jarah, et al., 2019
[19] Useng, 2013

3.2.5 Coastal areas

The *Regional Regulation on Zoning Plan of Coastal Areas and Small Islands of South Sulawesi Province 2019-2039* defines the following:

- **Coastal areas**: transitional areas between land and sea ecosystems affected by land and sea changes
- **Coastal waters:** seas bordering land covering waters as far as twelve nautical miles measured from coastlines, waters connecting beaches and islands, estuaries, bays, shallow waters, brackish swamps and lagoons
- **The Coastline:** the boundary of the meeting between the sea and land at the time of the highest tide.

Management of Coastal Areas and Small Islands (abbreviated as PWP-3-K) is a coordination of planning, utilisation, supervision, and control of coastal resources and small islands carried out by the Government and Local Government, between the intersectors, between land and sea ecosystems, as well as between science and management to improve the welfare of the people.

The Coastal Zone Plan and Small Islands (abbreviated as RZWP-3-K) is a plan that determines the direction of use of the resources of each planning unit accompanied by the determination of spatial structures and patterns in the planning area containing activities that can and should not be carried out and activities that can only be done after obtaining permission in coastal areas and small islands.

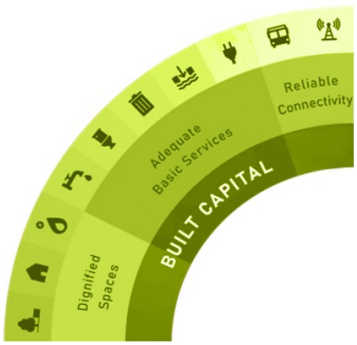
The following permissions are required for Coastal Zones and Small Islands:

- Licensing provisions are the authority of local governments
- Everyone who uses space from some coastal waters and the waters of small islands on a sedentary scale must have a Location Permit from the Governor
- Everyone who uses aquatic resources must have a Management Permit from the Governor
- Local communities and traditional communities that conduct space utilization activities and resources of coastal waters and waters of settled small islands must have a permit from the Governor.

RZWP-3-K states that the utilisation of small islands and surrounding waters is to be carried out based on a comprehensive ecological and economic unity and integrated with the large islands nearby. Utilisation of small islands and surrounding waters is prioritised for the following purposes:

- Conservation
- Education and training
- Research and development
- Marine cultivation
- Tourism
- Sustainable fisheries and marine businesses and the fishing industry
- Organic farming
- Farms
- Defence and national security.

4. BUILT CAPITAL: URBAN INFRASTRUCTURE AND SERVICES



4.1 PUBLIC SPACE

4.1.1 Policy, law, and regulation

For the purposes of this study, the definition of public space extends beyond green open space to include key public amenities such as sport centres, community centres, religious spaces and coffee shops (Warung Kopi). The Indonesian Government has set regulation on the percentage of total land area allocated to green open space at 30% (made up of 20% public and 10% private) through the Ministry Policy *"Peraturan Menteri (Permen) PU Nomor 5 Tahun 2008 Tentang Penyediaan dan Pemanfaatan Ruang Terbuka Hijau di Kawasan Perkotaan"*.

Another Regional Policy "*Peraturan Daerah (Perda) Kota Makassar Nomor 4 Tahun 2015 Tentang Rencana Tata Ruang Wilayah Kota Makassar 2015 – 2034*", defined public open spaces in two main typologies, public green open spaces and public non-green open spaces. The public green open spaces indicated dedicated spaces planted with vegetation owned and managed by government, including areas in the periphery of rivers or nature conservations. The non-green public open spaces incorporate areas such as pedestrian, plazas, squares and blue open space as coastal and riverine zones.

The function of public space has also been defined through different policies. The use of public space to accommodate health and fitness activities are reflected in both Constitution, in Undang (UU) RI Nomor 3 Tahun 2005 Tentang Sistem Keolahragaan Nasional, and Regional Policy, in Peraturan Daerah (Perda) Kota Makassar nomor 6 Tahun 2006. Other policies focus on public space as a place to accommodate safe play areas for children (Constitution, Undang (UU) RI Nomor 23 Tahun 2002 Tentang Perlindungan Anak). Other policies focus on incorporate public spaces in new developments to provide comfort and safety for the pedestrian (the regional policy Peraturan Daerah (Perda) Kota Makassar Nomor 4 Tahun 2015 Tentang Rencana Tata Ruang Wilayah Kota Makassar 2015 – 2034).

4.1.2 Existing service delivery situation

Over the last 30 years, green open space in major cities in Indonesia such as Jakarta, Medan and Makassar, has been decreasing from 35% to an average of 10% of land area. Today, approximately 11% of land has been allocated to open space across Makassar, and it is not evenly distributed. Figure 18 shows the areas across Makassar that are within 15 minutes walking distance to open space.

Table 4 shows the amount of green open space (hectares) for each Kecamatan, including the type of green open space and the percentage of land area for 2015. In 2015, the Kecamatan with the highest amount of land area covered by green open spaces include Biringkanaya, Panakkukang, Tallo and Tamalate Kecamatan. The Kecamatan with the lowest amount of green open space include Kepulauan Sangkarrang, Wajo and Bontoala.

Figure 19 maps green infrastructure across the city including the categories shown in Table 4.

Figure 16: High density settlements that can access green open space by walking within 15 minutes

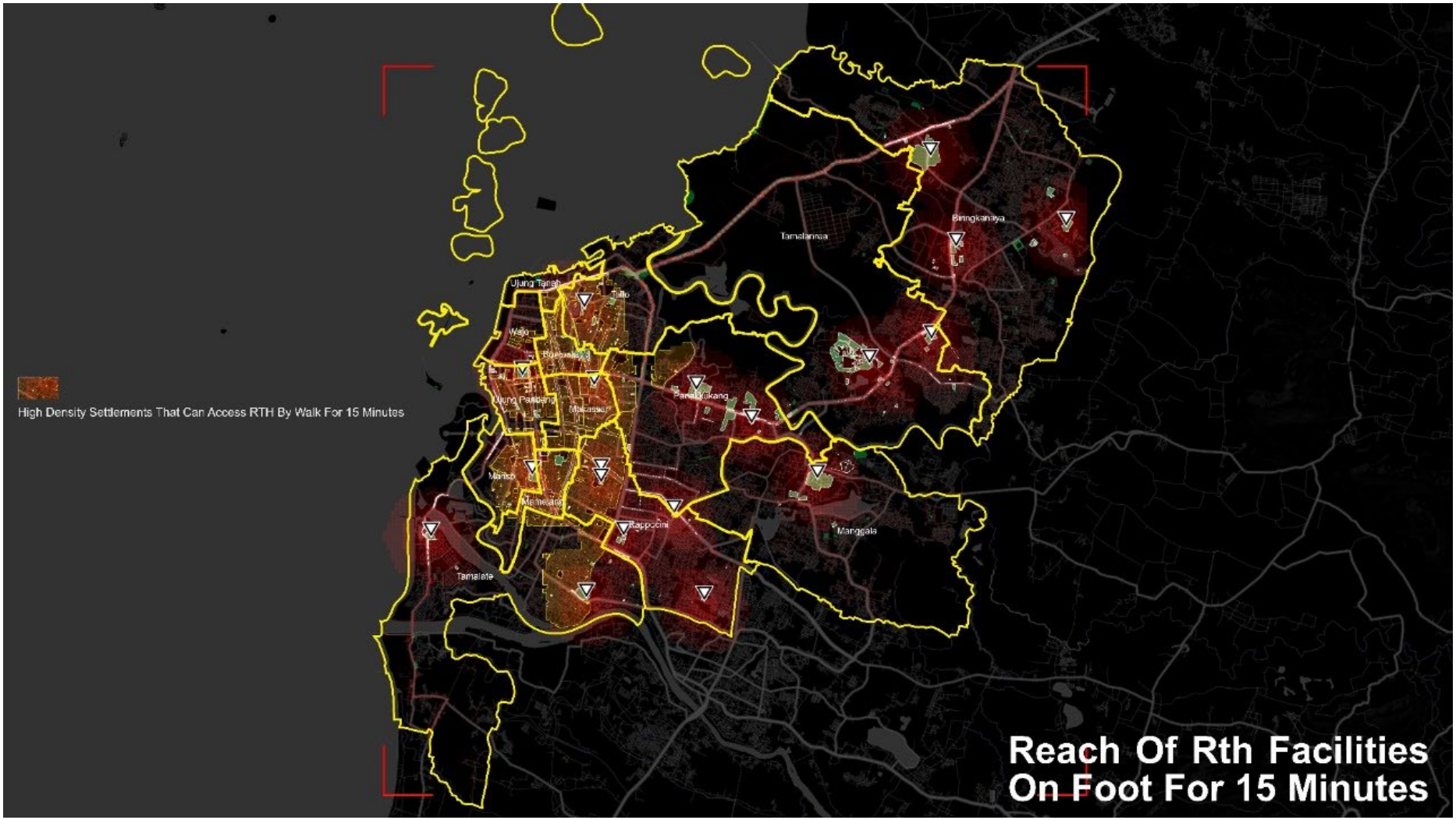
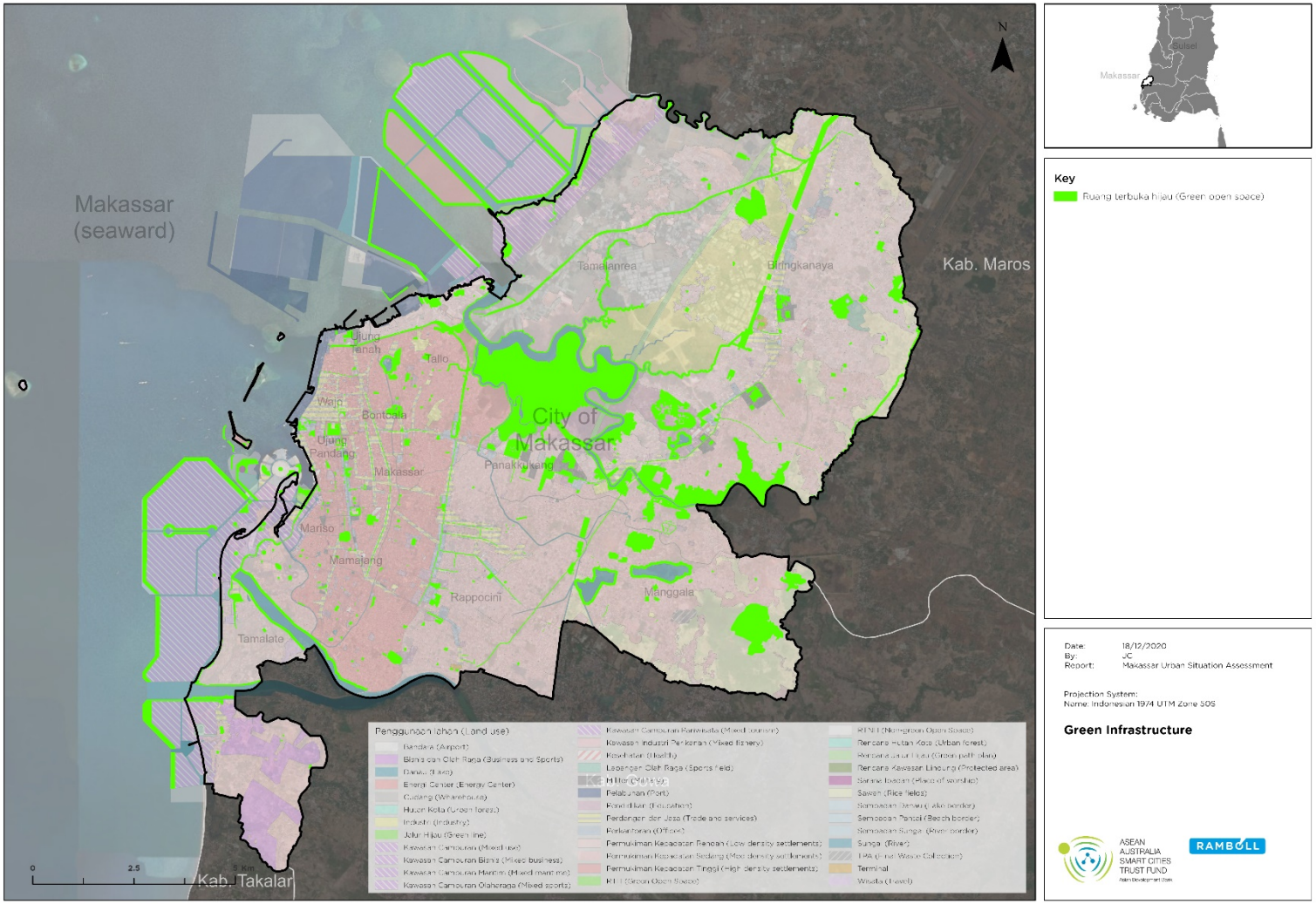


Table 4: Amount of green open space by Kecamatan by type (2015) [20]

KECAMATAN	CITY FOREST (HA)	GREEN CHANNEL (HA)	FIELD (HA)	GARDEN (HA)	CEMETERY (HA)	MANGROVE (HA)	GREEN BORDER CORRIDORS	TOTAL (HA)	% OF CITY AREA
Biringkanaya	62.93	8.86	108.96	61.21	17.08	10.1		269.14	1.53
Bontoala		0.45		4.7	1.16			6.31	0.04
Kepulauan Sangkarrang			0.39		0.31			0.7	0
Makassar		2.63	0.29	3.87	1.88			8.65	0.05
Mamajang		0.15	0.26	1.74	4.44			6.59	0.04
Manggala		2.18	13.47	3.1	37.05	17.9	2.11	75.8	0.43
Mariso	0.54	1.93	5.63	2.04				10.14	0.06
Panakukkang	17,90	10.31	14.87	11.44	13.34	145.88	35.6	249.33	1.42
Rappocini		9.32	9.42	5.06	1.25			25.04	0.14
Tamalanrea	44.51	16.17	13.62	11.47	5.31	20.99	74.53	186.61	1.06
Tamalate	0.75	6.43	15.52	14.44	5.07		161.83	204.04	1.16
Ujung pandang		2.98	8.46	4.44				15.89	0.09
UjungTanah		4.24	2.76	1.55				8.56	0.05
Wajo		1.16	0.02	0.73	0.03			1.94	0.01
Total	**126.64**	**71.21**	**197.60**	**132.90**	**100.02**	**558.93**	**274.07**	**1,461.34**	**8.31%**

[20] Dinas Pertamanan Kota Makassar, 2015

Figure 17 Green Infrastructure



4.1.3 Needs and development plans

The Makassar Urban Spatial Plan contains the Urban Green Open Space Plan, shown in Figure 20. The Plan identifies the minimum green area for each key area across the city, ranging from 20% to 60% in some areas.

Planning for public space in Makassar is focused on increasing the amount of public space by percentages of total land area. However, there is still a long way to go to align public needs and the implementation of national policy. Although the public space is proven to boost the local economy, provision of facilities catering for pedestrian, people with disabilities and children have been limited. Challenges such as low awareness and advocacy on the right for public space, especially for disabled and children have contributed to the limitation. Finite allocated budget and siloed implementation further delayed the provision. As an example, ranges of budget allowance for disabled facilities are determined under several agencies such as public health (Dinas Kesehatan) and education (Dinas Pendidikan dan Kebudayaan). Moving forward, stakeholders will also need to investigate ecological and environmental impacts and benefits of public spaces, recognising both their social value and environmental value to the city of Makassar.

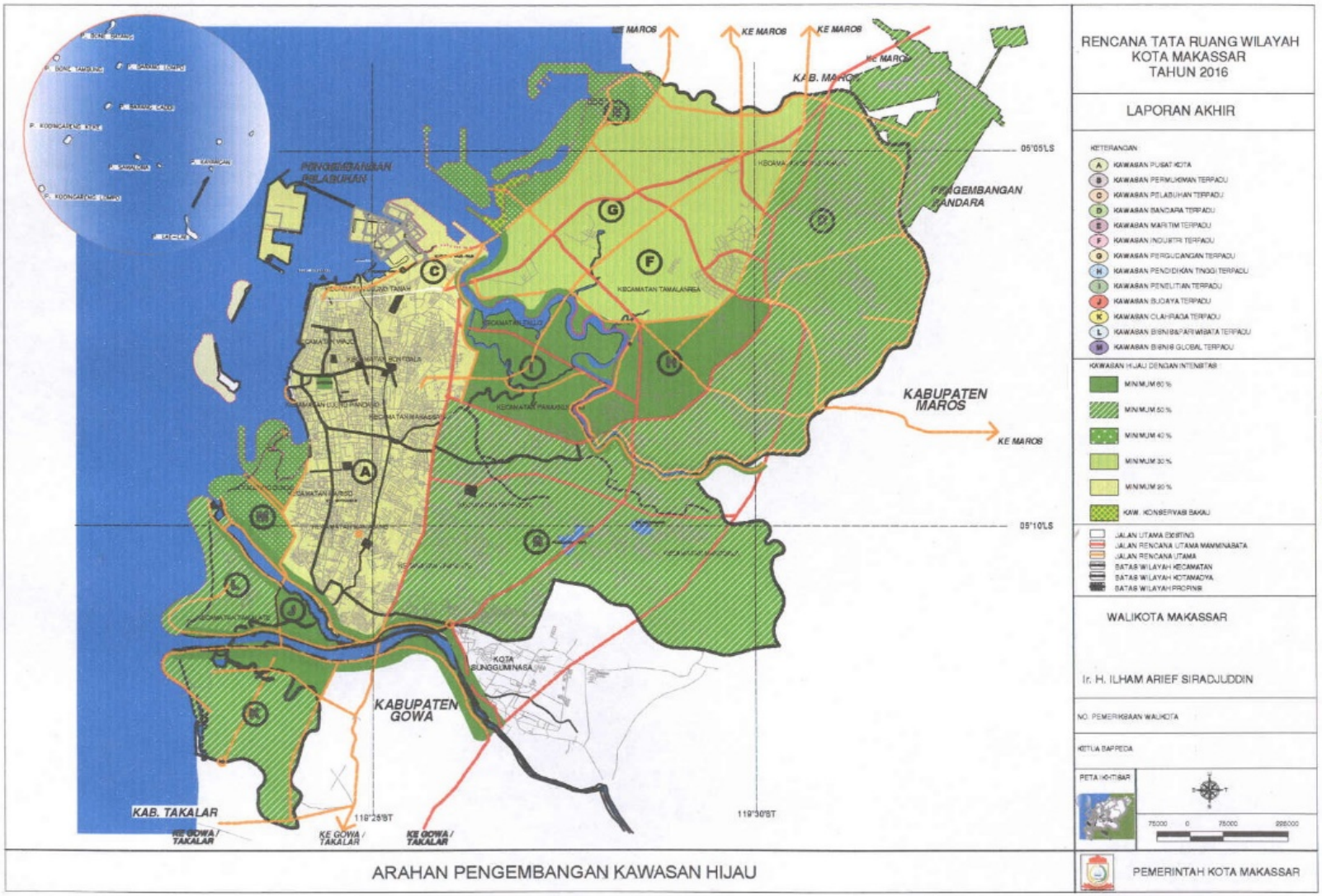
The City of Makassar's goal to improve healthcare facilities and health outcomes for residents can also be achieved through the provision of health facilities and public spaces that are well distributed throughout the city. Since 2016, the City of Makassar officials have been planning for the Bundaratta pedestrian footpath in the city centre. By the end of 2020, the officials have rolled out revitalisation programs for city parks.

Challenges for public space alongside streets in Makassar include a lack of footpath maintenance, unregulated informal parking and the occupation by street vendors. These challenges can lead to competition for limited road-side space. Support for the informal sector, such as regulating locations for livelihood activities, could contribute to the efficient and safe allocation of space for various activities, while maintaining footpath clearance and safer traffic movement.

During the Covid-19 pandemic, fitness activity surged throughout the city, especially running and cycling (RRI, 2020). Due to an inadequate amount and distribution of open space, footpaths and cycleways, runners and cyclist are forced to use roadways at the risk of traffic incidents.

A key part of the approach to attract visitors to Makassar is the provision of quality and vibrant public spaces, activated with retail and commercial enterprises, with food service opportunities and attractions. Safe, accessible, attractive and vibrant public spaces are a key element to attract tourists and encourage visitors to stay longer.

Figure 18: Green Open Spaces targets for Makassar [21]



[21] Makassar City Spatial Plan 2016

4.2 WATER SUPPLY

4.2.1 Existing service delivery situation

Source of drinking water

Public water supply in Makassar City is the responsibility of the Perusahaan Daerah Air Minum (PDAM) Kota Makassar. PDAM Kota Makassar is by far the largest water utility in Mamminasata. PDAM Kota Makassar operates five surface water treatment plants with a total installed capacity of 3,050 L/s during the wet season.

The three main sources of water for human consumption and for bathing/washing are bottled water, public water supply and groundwater from drilled/pumped wells. Services related to bottled water are provided by private drinking water carters. PDAM Kota Makassar provides the public water supply service, with a coverage of about 60-70% of the population in Makassar City. Drilled/pumped wells are owned by households, industry and large hotels, that herewith service themselves.

Bottled water (60.2%) and public water supply (36.6%) are the main sources of drinking water for the population of Makassar City. This indicates that 96.8% of water used for human consumption has been treated to a certain extent. Subsequently, 3.2% of water used for human consumption is not treated.

Public water supply (58.4%) and a drilling well/pump (36.4%) are the main sources of water for bathing/washing for the population of Makassar City. This indicates that approximately 60% of water used for personal hygiene has been treated to a certain extent.

Table 5: Main source of drinking water in the city of Makassar, 2018 [22]

DWELLING STATUS	TOTAL	BOTTLED WATER	PUBLIC WATER SUPPLY	DRILLING WELL/ PUMP	WELL	WATER SPRINGS	RIVER WATER	OTHERS
Self-ownership	80.15	46.95	30.80	1.35	0.25	0.05	0.15	0.60
Leasing house	6.05	4.10	1.70	0.10	0.15			
Rental house	2.05	1.25	0.65	0.10				0.05
Official house	4.70	3.15	1.50	0.05				
Free rental house	6.80	4.55	1.85	0.10	0.15			0.15
Others	0.25	0.15	0.10					
Total	100.00	**60.15**	**36.60**	1.70	0.55	0.05	0.15	0.80

[22] Household Expenditure Survey 2018

Table 6: Main source of water for bathing/washing in the city of Makassar, 2018 [23]

DWELLING STATUS	TOTAL	BOTTLED WATER	PUBLIC WATER SUPPLY	DRILLING WELL / PUMP	WELL
Self-ownership	80.15	0.90	49.50	26.95	2.80
Leasing house	6.05	0.05	3.05	2.50	0.45
Rental house	2.05	0.05	0.60	1.05	0.35
Official house	4.70		2.30	2.30	0.10
Free rental house	6.80	0.10	2.85	3.50	0.35
Others	0.25		0.10	0.10	0.05
Total	**100.00**	**1.10**	**58.40**	**36.40**	**4.10**

Table 7: Number of customers and distributed water in the city of Makassar, 2019 [24]

AREA	NUMBER OF CUSTOMERS	DISTRIBUTED WATER (M^3)	VALUE (RP)
City of Makassar	174,593	46,046,803	295,941,588

Table 5 to Table 7 indicate the following key characteristics for Makassar:

- Per customer consumption (refers to customer connections) of water from public water supply in 2019:
  - Approximately 264 m^3 per customer per year
  - Approximately 722 litres per customer per day
- Approximately 145 litres per capita per day (lpcd), presuming each customer connection services 5 persons (note: It is recognised that 145 lpcd is comparatively high, as the method for calculating includes also the commercial water demand)
- Cost of water from public water supply in 2019:
  - Approximately 1,695 Rp per customer per year
  - Approximately 6.427 Rp per m^3 (Approximately US$ 0.00046 per m^3).

[23] Household Expenditure Survey 2018

[24] Makassar City in Figures 2020, Local Water Company of Makassar Municipality, 2019

Surface water
Surface water resources are inadequate during the dry season, predominantly caused by the large seasonality effect in the Maros River feeding through the Lekopancing Dam into the Panaikang Water Treatment Plant. Low surface water availability limits the expansion of public water supply services by PDAM Kota Makassar in Makassar City.

Jeneberang River
The Jeneberang River is the main water resource for Makassar. The intake of river water for public water supply starts at the Bili-Bili dam and continues along the Jeneberang River until the river discharges into the Makassar Strait to the south of Makassar City. The Bili-Bili dam is located 35 kilometres upstream of the Jeneberang River. This dam has a large storage capacity and provides hydroelectricity, flood control, recreation and water for various usage. The Bili-Bili dam reduces the seasonality effect downstream of the Jeneberang River, thereby providing water supply security in the dry season.

Maros River
The Maros River is the second water resource for Makassar. The Maros River originates from the mountain range in the northeast of Mamminasata. The river crosses the Maros Kecamatan and discharges in the Makassar Strait to the far north of Makassar City. The Bantimurung river is a major tributary to the Maros River. The Maros River has a length of 82 kilometres and has a large catchment area. Nevertheless, the Maros River shows a large seasonality effect with reduced flow in the dry season. PDAM Kota Makassar abstracts surface water from the Maros River at the Lekopancing Dam located around 30 kilometres inland from Makassar City.

4.2.2 Water supply standards
The applicable Drinking Water Standard is entitled (in Indonesian): "Peraturan Menteri Kesehatan Republik Indonesia Nomor 492/Menkes/Per/IV/2010 Tentang Persyaratan Kualitas Air Minum Dengan Rahmat Tuhan Yang Maha Esa Menteri Kesehatan Republik Indonesia" (or: Regulation of Health Minister, note 492 / Minister of Health / Per / IV / 2010) dated April 19, 2010.

Both a visible level of turbidity and a visible colour of the water provoke the perception that the water isn't potable water. This might be the dominant driver for the consumption of bottled water by the citizens of Makassar City that can afford this.

4.2.3 Needs and development plans

Key challenges
The key challenges are:

- Extracting additional surface water from the environment, treating this surface water to high-quality water at a cost, pumping this precious water into the water distribution network requiring energy, and then experiencing 40-50% Non-Revenue Water is not sustainable.
- New water production and distribution capacity must be used for areas with as low as reasonably possible leakage. Non-leaking water distribution networks should dictate the order of investments.
- Public water supply capacity in Makassar City is substantially reduced by a high volume of Non-Revenue Water (NRW), comprising [25]:
  - Leaks in transmission and distribution pipes and service connections, because of aging pipes
  - Illegal connections

[25] CSIRO (2012)

  - Errors in water meter accuracy and meter reading in the field
  - Water use for social needs (which is not billed)
- Intermittent water supply – according to SCE (2019) the water distribution network is pressurised for 22 hours per day and about 50% of the customers have adequate pressure
- Supply of treated and microbiologically safe water for human consumption to citizens of Makassar City that are not connected to public water supply and that cannot afford to pay for bottled water.
- Significant reduction of the volume of Non-Revenue Water in Makassar City, where NRW is currently estimated to be 40-50% of the water supplied to the water distribution network.
- Simultaneous and coordinated improvement of:
  - Management of water resources, both groundwater and surface water resources
  - Technical water infrastructure
  - Water loss control and NRW reduction
  - The organisation of PDAM Kota Makassar, both in terms of organisation structure as well as knowledge and capacity of professional staff.

The current challenges related to the raw water supply availability and quality in Mamminasata will persist in the future unless coordinated action is taken. Further, Makassar City will have insecurity in water supply in the next few decades, unless consideration is given to alternatives other than upgrading water treatment plants alone

Potential broadscale sector interventions

The broadscale sector interventions should include:

- Implementation of a backwash water reuse facility at each large-capacity water treatment plant, to start with the current Somba Opu and Panaikang WTPs, to be included in the design of the planned new Somba Opu II WTP and to be considered for inclusion in the design of the planned new KIMA WTP (depending on selected treatment technology)
- Changing the utility policy regarding Unbilled Authorized Consumption (UAC). UAC is a component of NRW. It includes 'water for free' (unbilled per utility policy), network flushing and firefighting water and sometimes also irrigation water for public parks and spaces, etc. Experiences learn that the 'water for free' volume might be a large volume. As this water comes with a cost for PDAM Kota Makassar, minimising this volume directly generates revenue that can be invested.

Recommendations for execution of development scenario

The recommendations are:

- Significant NRW reduction in Makassar City will require about 25 years and a project management approach. PDAM Kota Makassar may consider support from a professional NRW reduction company for about 10 years i.e. via a Performance-based Service Contract
- Develop new technical water infrastructure for areas of Makassar City where interventions for NRW reduction are being implemented or scheduled for the near future.

4.3 SANITATION

4.3.1 Policy, law, and regulation

Targets
As part of Indonesia's commitment to achieve the Sustainable Development Goals, the Ministry of Public Works has set a target (under the RPJMN 2020-2024) to increase access to drinking water (100%) and access to sanitation (90%) and to alleviate 10,000 hectares of slum area. I This means, by 2024 Indonesia is planned to have 100% coverage for water supply, 10,000 hectares less slum, and 90% access to sanitation. These targets are embedded in 2020-2024 Strategic Plan of the Ministry of Public Works and Housing which was developed based on the RPJMN 2020-2024.

4.3.2 Existing service delivery situation

Key principles
As with many developing economies, there are multiple challenges that need to be addressed in Makassar City and the wider Mamminasata metropolitan area. Many of which are inter-related, such as access to basic services, financial constraints and social equity, urban planning and the state-of-the-environment and public amenity. In addition, the institutional, economic and social context in Makassar City and the Mamminasata area is complex, as with any developing country. Whilst regulations and standards are abundantly available, their enforcement or implementation is often marred by institutional and economic constraints.

Sanitation (wastewater services) must be considered as part of the overall water cycle in the management of urban water supply, wastewater and stormwater (drainage). In the case of Makassar City and the Mamminasata area, these elements need also to be integrated with solid waste management. The intention is that, for the Makassar Livable City Plan, these elements will be considered collectively to development integrated solutions as part of formulating development scenarios and prioritisation of strategies for improvement.

Drivers to develop a specific situation assessment for sanitation are:
- The present sanitation services are inadequate and unintegrated, due to inadequate and poorly enforced regulations, constrained by economic resources and capacity
- The huge amount of investments that will be necessary over a prolonged period of up to many decades to ensure effective sanitation in a metropolitan area where population growth and urban development are overwhelming the long-term sustainability of urban growth.

Existing and planned sanitation

The situation on wastewater treatment facilities in Makassar City as of 2015 per Kecamatan is presented in Table 8. The source of this table is Bappeda Kota Makassar 2015. The projected future situation on wastewater treatment facilities in Makassar City per Kecamatan is presented in Table 9.

It is understood that, since the publication of this data, the ADB Neighbourhood Upgrade and Shelter Program (NUSP) has delivered communal wastewater treatment plants (communal WWTP) in:

- Tamarunang, Mariso Kecamatan in 2017
- Panayaran, Mariso Kecamatan in 2018.

Confirmation and further description of these additional Communal WWTP will be provided in the next phase analysis. This further analysis would include additional facilities scheduled for implementation in Makassar City in the next few years.

Table 8: Wastewater treatment facilities in Makassar City as of 2015 [26]

Kecamatan	Total HHs	Number Public Toilets	Public Toilet HH Users	Number IPAL Communal	IPAL Communal HH Users	Number Communal Septic Tanks	Communal Septic Tank HH Users
Biringkanaya	35,684	0	0	2	196	0	0
Bontoala	14,140	28	126	0	0	0	0
Makassar	15,949	31	172	0	0	31	172
Mamajang	16,294	3	15	1	45	0	0
Manggala	24,658	23	699	2	393	0	0
Mariso	13,401	5	55	1	288	0	0
Panukkukang	26,929	21	115	0	0	2	6
Rappocini	28,444	0	0	0	0	0	0
Tallo	35,618	0	0	0	0	0	0
Tamalanrea	22,498	8	20	0	0	0	0
Tamalate	32,904	6	118	1	100	6	118
Ujung Pandang	7,177	45	360	3	433	37	290
Ujung Tanah	11,331	2	135	0	0	0	0
Wajo	11,347	14	74	0	0	0	0

[26] Bappeda Kota Makasar

Table 9: Scheduled wastewater treatment facilities in Makassar City [27]

Kecamatan	Total HHs	HHs Septic Tanks	HHs Public Toilet	HHs IPAL Communal	HHs with Sanitation	HHs without Sanitation
Biringkanaya	54,315	54,113		41	54,154	161
Bontoala	15,395	15,232		114	15,346	49
Makassar	23,840	23,610		155	23,765	75
Mamajang	16,768	16,100		639	16,739	29
Manggala	39,140	38,553		319	38,872	268
Mariso	16,604	16,013	36	445	16,494	110
Panukkukang	38,567	37,933		444	38,377	190
Rappocini	40,324	39,599		723	40,322	2
Sangkarang	3,844	3,566			3,566	278
Tallo	38,751	37,069		1,662	38,731	20
Tamalanrea	27,589	27,366		161	27,527	62
Tamalate	49,509	48,527		897	49,424	85
Ujung Pandang	7,318	7,207		91	7,298	20
Ujung Tanah	9,801	9,607	62		9,669	132
Wajo	9,348	9,312			9,312	36

As a result of this schedule, most households (98%) will own septic tanks in future, though not all existing septic tanks are built in accordance with technical standards (estimated at about 10%).

On-site household septic tanks are the cornerstone of the current sanitation system in Makassar City, now covering about 80-85% of the population. Only a limited number of households were connected to separate sewer networks feeding into the Nipa-Nipa wastewater treatment plant. The planned MSMIP subproject Makassar including the new Losari WWTP will change this.

On-site septic tanks are in general not-desludged, with less than 1 percent of estimated 383,800 septic tanks being desludged annually.

Communal wastewater systems, proposed as part of the three-tiered sanitation system, were either damaged or not functioning optimally in 2017. The current situation is unknown.

Makassar City has scheduled to implement many additional sanitation facilities in coming years.

Based on available data and studies to date, estimates of population in Makassar City covered by any type of sanitation system currently is about 80-85%. On-site (households) septic tanks are the dominant type of sanitation system. Frequent desludging is a requirement for proper functioning of septic tanks. Desludging services are available in Makassar City, however the

[27] DPU Kota Makasar, 2020

current number of septic tanks being desludged is too low to guarantee this proper functioning. The current communal sanitation systems seem also to lack the required maintenance, which has caused a high percentage of these to be wasteful investments.

This underpins the need for adequate operation and maintenance as a key component of future investment in a sanitation system, in order to ensure efficient functioning over longer periods of time. Also, adequate operation and maintenance is required for the planned more complex off-site centralised sanitation systems.

Inherited backlog
Makassar City, as most cities in Indonesia, faces a significant under supply of conventional off-site centralised sanitation systems that can be operated and maintained professionally. Population growth and urban development increase the need for fast-track investments in public sanitation services, which means the current issues are likely will worsen unless an integrated and sustainable approach is adopted.

Need for more efficient and effective water management
There is a strong interdependency between water supply, sanitation, stormwater, solid waste management and urban development in Makassar City and the Mamminasata area. The volume of wastewater generated in a city is typically expected to rise sharply in line with the improvement of water supply services.

Although details of the design of the planned Losari WWTP (component of the MSMIP subproject Makassar) have not been disclosed, the indicative calculation of 16 Mld capacity for 14,000 connections and 5 persons per connection would result in a volume of close to 230 litres of wastewater per person per day. This level of wastewater generation indicates an equally high demand for drinking water, which is considered an unsustainable level of water usage. As part of an integrated strategy for water and sanitation, measures to reduce water uses, increase water efficiency would be key elements to enhance livability and protect water resources for the future.

MSMIP project
The MSMIP subproject Makassar marks a significant step toward effective sanitation in Makassar City. This subproject implements the three-tiered sanitation system:

- An off-site (centralized) wastewater system in a high-density area of the city
- Community-based sanitation systems with connections for the urban poor
- Desludging capacity to serve for households with on-site septic tanks.

The subproject Makassar comes with an investment cost of US$ 63.72 million. When applying an investment cost of US$ 280 per person served to the approx. 470,000 people that live in the six high-density Kecamatan of Makassar City, the required investment budget would be US$ 132 million. Please note that part of these 470,000 people is covered by the current MSMIP subproject. In order to fully benefit of the investment over a longer period, it is necessary that operation and maintenance of both the communal systems and the household septic tanks (desludging frequency) will be ensured.

Systemic transformative change
Innovative solutions combined with behavioural changes in a process of transformative change are key to developing effective sanitation for all members of society in Makassar City. An important behavioural change is related to operation and necessary maintenance of sanitation systems, including on-site septic tanks, communal sanitation systems or the off-site centralised sanitation systems. Maintenance includes:

- Frequent household septic tank desludging
- Ongoing maintenance of community-based systems after the initial capital investment
- Adequate management regimes for off-site centralised sanitation systems.

In addition to behavioural change, innovations such as greywater reuse should be considered. Greywater can be intercepted/reclaimed, treated and reused for non-potable usage such as toilet flushing, laundry washing, irrigation, cleaning and the like. Surplus treated greywater can also be used for groundwater recharge (potentially using the earlier recommended adsorption well, Biopori, at each house).

To enable a behavioural and systemic transformation, the sanitation system would incorporate:

- On-site household septic tanks in low-density areas or in high-density areas where cost-effective connections cannot be made
- Off-site centralised sanitation systems in high-density areas.[28] These systems should include wastewater trunk mains, wastewater piping, household and commercial connections, pumping stations and wastewater treatment plant with septage reception facilities including solid-liquid separation equipment. The MSMIP subproject Makassar including the Losari WWTP with a new septage solid-liquid separation facility marks a significant step toward effective sanitation in Makassar City
- Communal greywater systems for reclaiming, treating, recycling and reusing greywater for non-potable water usage, through a dedicated second service connection. These communal greywater systems should replace the communal sanitation systems (that predominantly aren't properly maintained). Maintenance of a communal greywater system can be more cost-effective and less time-consuming than maintenance of a communal sanitation system as greywater has a lower fouling potential.

4.3.3 Needs and development plans

Opinion on key challenges
The key challenges are:

- Fast-track elimination of the inherited backlog on conventional large-capacity off-site centralised sanitation systems that can be operated and maintained professionally
- Further develop the three-tiered sanitation system for Makassar City building on:
  - Properly installed septic tanks that comply with current technical standards and that are well-maintained
  - Conventional large-capacity off-site sanitation systems in high-density areas
  - Community-based and community-maintained systems for either sanitation (if the community can ensure operation and maintenance over a long-term) or greywater reclamation, in case maintenance must be lower-cost and less time-consuming.

[28] It is very important to design these systems for blackwater only, and to be operated with an as low as reasonably achievable wastewater flow. This to avoid the need to install large capacity water supply. The water supply capacity in Makassar City might be limiting the proper operation of future centralised sanitation systems.

Potential broadscale sector interventions

The broadscale sector interventions should include:

- Start considering greywater reclamation at communal scale and reusing treated reclaimed water for onsite non-potable (low-pressure) usage such as toilet flushing and irrigation of public space. These communal greywater systems should replace the communal sanitation systems. Maintenance of a greywater system can be more cost-effective and less time-consuming because greywater has a lower fouling potential
- Start considering treated effluent reclamation at the new Losari WWTP and reusing treated reclaimed water for area-wide usage such as firefighting (high-pressure) and irrigation of large public space (low-pressure)
- Develop and provide training courses on household septic tanks and community-based systems. Offering such training is a way of lowering the hurdles for the broader public to maintain wastewater systems.

Recommendations for execution of development scenario

Our recommendations are to:

- Further analysis and data integration are required into sanitation upgrades since 2015 and description of the planned upgrades in the near future, including plans for centralised and communal wastewater treatment facilities.
- Develop a so-called programme management office to both support and supervise the various projects that will take place the coming three to five years, each of them contributing to improving the existing situation of sanitation in Makassar City (i.e. the MSMIP subproject Makassar, Makassar City as pilot city for the LSIP and RISE)
- Prioritize the implementation of the abovementioned projects combined with developing the projects and programme for the period 2025-2030
- Develop and start a public awareness campaign to:
  - Stimulate households to have their septic tanks proactively desludged
  - Stimulate households to replace their existing septic tanks in case they are not built in accordance with technical standards.

4.4 SOLID WASTE MANAGEMENT

4.4.1 Policy, law, and regulation

The Regulation of the Minister of Home Affairs (Permendagri) No. 33 of 2010 on Guidelines for Waste Management outlines the administrative and management aspects of waste collection from the household level, residential areas, commercial and industrial areas, and for public and social facilities.

Regulation No. 56 of 2015 of Makassar City concerning the Review of Waste/Hygiene Service Retribution Rates includes tariffs for levies on commercial garbage services, tariffs for door-to-door household garbage transportation services, tariffs for levies on household waste transportation services with disposal directly into containers, and tariffs for street vendor garbage transportation service fees.

The Mayor's Regulation No. 36 of 2018 on the Policies and Strategies in Household Waste Management and Household Waste sets out further policies and strategies for the management of household waste and similar waste, and also progressive targets on waste volume (in tons/year) and the waste reduction target in percentage (%) as well as in tons/year at City level.

4.4.2 Existing service delivery situation

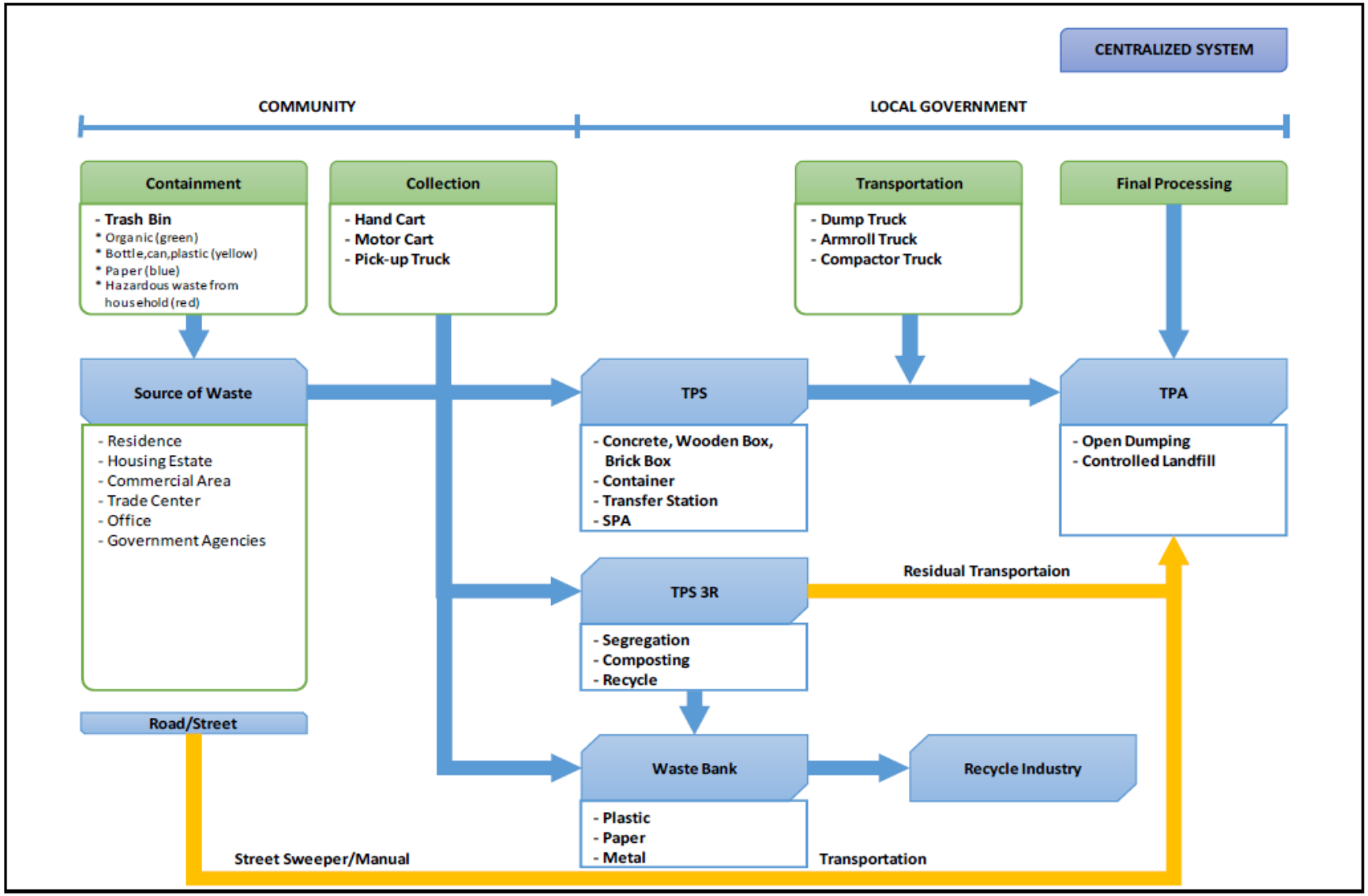
Households are required to take their waste to designated collection points, where the waste is collected by the garbage collection service. There are currently thirteen Kecamatan functioning as service areas for solid waste management, all except the Tamalate Kecamatan and the Sangkarang Islands. There are several hundred shared and public garbage/trash bins, multiple temporary storage facilities (TPS) and about 900 waste banks spread throughout Makassar City.

According to *Badan Perencanaan Pembangunan Daerah* (BAPPEDA) [29], Makassar City generated approximately 700 tons of waste per day in 2016, consisting of 82% of organic waste and 18% of inorganic waste. In 2017, the average volume of waste generation was 6,500 m^3/d with 95% transported to the landfill.

The flowchart of the existing municipal solid waste management system in Makassar City is presented in Figure 19. Source of this flowchart is the report "*City Technical Capacity Support for Solid Waste Management Investment Preparation for Indonesia, Environmental & Social Safeguards – Makassar Final Report*" by Dinas Lingkungan Hidup Kota Makassar.

[29] City Development Planning Agency.

Figure 19: Makassar City municipal solid waste flowchart (2017)



4.4.3 Institutional arrangements

Waste management in Makassar City is based on the City's Regulation No. 4 of 2011 concerning Waste Management. In this regulation, the collection, transportation and disposal of garbage is managed by the Makassar City Park and Cleanliness Service. Lately, however, the collection of household waste has been transferred to each Kecamatan by Regulation No. 3 of 2015 concerning the Delegation of Authority for Collection of Waste/Hygiene Service Levies to Kecamatan Administrators in the City of the Makassar by the Mayor.

In zone 1, where the density is high (more than 100 people/ha) the city of Makassar plans to provide 100% collection method (from household to temporary disposal centre to final disposal centre) while for zone 4, where the density is around 25-100 people/ha, the method is also collection combine with TPS 3R concept. Within ten years, the city plans to have 100% coverage area for solid waste collection where 80% of the effort is for waste disposal, while 20% is to reduce waste.

4.4.4 Needs and development plans

Key challenges

The solutions and investments proposed by SCE [30] in 2019 in the SISHA project can be implemented on a city-wide and slum-specific basis. For the benefit of Makassar City and other elements of the water and sanitation systems (e.g. stormwater drainage capacity and to minimize flooding), a mix of engineering solutions and social intervention (training, awareness campaigns and the like) for solid waste management would provide significant benefits to improving livability in Makassar.

The overall objective for the improvement of the municipal solid waste management system must be to have all municipal solid waste collected and transported to the municipal solid waste management system and, especially, to eliminate dumping of waste in the canals, river and on land. In this regard, it is necessary to expand the operational numbers of all components of the system: bins, collection fleet, TPS, TPS-3R and waste banks. The collection fleet must be suitable for the high-density and slum areas of Makassar City.

SCE [31] reports the following issues with waste management in slum areas:

- Collection fleet too limited to achieve 100% service coverage
- Affordability of waste collection fees
- Competition between the waste bank and other private collectors.

The 3Rs approach must be applied and facilitated to the greatest extent possible, city-wide. By sorting waste at the source, solid waste can be provided to the recycle industry as a resource. This should reduce the volume of municipal solid waste to be dumped on the landfill.

City-wide institutional improvements, regulatory reforms and enforcement to eliminate local dumping of garbage/trash are required. Municipal solid waste must be viewed as a resource. The Makassar City municipal solid waste management system (Figure 19) includes all necessary components of an effective waste management system. However, the behaviours and actions of the community is a key element of the current failings in the waste management process. For example: SCE [32] identifies garbage/trash is often dumped outside of designated garbage

[30] *TA-8556 REG: Pre-Feasibility Study on the Slum Improvement in Strategic Human Settlements Area Project (47285-001)*, 2019
[31] *TA-8556 REG: Pre-Feasibility Study on the Slum Improvement in Strategic Human Settlements Area Project (47285-001)*, 2019
[32] *TA-8556 REG: Pre-Feasibility Study on the Slum Improvement in Strategic Human Settlements Area Project (47285-001)*, 2019

containers and on the roadside, and into canals. Further Most people still view garbage as useless waste, not as a resource that needs to be utilised. Accordingly, training and (public) awareness are considered very important.

Potential broadscale sector interventions
The broadscale sector interventions should include:

- Training relating to the operation of the TPS-3R must be provided. It is necessary that the staff in charge do have the skills to operate the TPS-3R machinery.
- Reward better behaviour and penalise illegal dumping of waste in the environment.

Recommendations for execution of development scenario
Our recommendations are to:

- Investigate the strategies for minimising solid waste to landfill through 3R approach, including the options for public versus private
- Develop and start a public awareness campaign to increase awareness about the negative impact of current public littering behaviour. This is fully in line with the SCE (2019) recommendation
- Expand the operational numbers of all components of the municipal solid waste management system. Procure garbage bins, carts and the like. Reorganize the TPS, TPS-3R and waste banks to be (more) open and competitive on pricing of waste.

4.5 STORMWATER AND DRAINAGE

4.5.1 Policy, law, and regulation

The legal basis for drainage management in Makassar includes:

- Regional Regulation No. 06 of 2006 on the City Spatial Planning of Makassar; and
- Regional Regulation No. 13 of 2006 on Long-term Development Plan Area (RPJPD) of Makassar City 2005–2025.

4.5.2 Existing service delivery situation

Makassar is located on low-lying terrain between the deltas of the Jeneberang and Tallo Rivers. Hence, flooding is a common occurrence during the wet season (November-April). Flooding typically occurs in regions with low absorption soils; along river estuaries (e.g. along the banks of the Tallo River); within the Biringkanaya, Tallo and Tamalanrea Kecamatan; and at the estuary of the Jeneberang and Pampang Rivers. [33] Flooding in Makassar is attributed to the following: increased coverage of built-up areas and reduced catchment area; deforestation that occurs in the upstream areas; and a less than optimal drainage system. [34]

Makassar City has three primary drainage canals – *Panampu, Sinrijala and Jongaya* – which flow into the Tallo river. These three drainage canals were designed to cope with the 20-year return design flood. Secondary and tertiary drainage channels were designed for the 2 to 5-year return design flood.

Makassar's stormwater drainage system is gravity-based, consisting of open drains that transport both untreated greywater and stormwater into canals and waterways. The system was originally designed to accommodate simple community-led operation and maintenance practices, however, literature and anecdotal evidence gathered suggests that such maintenance does not occur as

[33] CSIRO, *Context and challenges in urban water and wastewater services for Makassar, South Sulawesi, Indonesia,* 2012
[34] LAPAN, *Point of Action: Supporting Makassar Smart City/Urban Development*, August 2020

frequently as needed. Properly functioning stormwater drainage covers only approx. 54% of the city area, located mainly in the western Kecamatan. [35]

The capacity of the stormwater drainage system is reduced by sedimentation and solid waste disposal practices. The widespread practice of indiscriminate solid waste disposal in Makassar negatively impacts public amenity, public health and the environment. In areas with insufficient waste collection, rubbish is either burned or illegally dumped alongside roads and waterways and often ends up in stormwater drainage channels. This not only reduces the drainage capacity and may cause blockages, but also impacts the operability and integrity of entire system, and furthermore provides opportunities for mosquito breeding due to stagnant water. Consequently, overflow of the drains and flooding during high intensity rainfall events is common.

The key challenge with regard to drainage in Makassar remains the lack of an overall vision/strategy for the integration of the entire network. This creates numerous ripple effects, from piecemeal planning and design, to inadequately maintained and sub-optimally operated infrastructure, all of which exacerbate the extent of flooding in Makassar.

4.5.3 Needs and development plans

Key challenges
Makassar is facing both city-wide and localised stormwater drainage challenges as recognized and reported in, among other documents, the Masterplan 2010-2030 for Makassar (2006), the CSIRO SUD Research Project (2012), and the recent SCE SISHA Project (2019).

The main overarching challenge regarding drainage in Makassar City is the lack of an overall vision/strategy for the integration of primary, secondary and tertiary stormwater drainage canals and ditches in the citywide stormwater drainage system. As a result, population growth and progressive concentration of people in Makassar City constantly surpasses the implementation capacity for new canals and ditches. Inadequate maintenance of existing channels, canals and waterways decreases the capacity of the existing (already strained) drainage system.

Work conducted on the Masterplan 2010-2030 for Makassar and more recent plans developed by KOTAKU and SCE provide an excellent basis for understanding and identify key (and priority) intervention areas/actions. A thorough review of these plans should result in fit-for-purpose solutions for current stormwater drainage related challenges in Makassar.

Potential broadscale sector interventions
The broadscale sector interventions should include:

1. Dredging and deepening of stormwater drainage canals and removal of rubbish and garbage from the canals and waterways can temporarily improve flows. Such measures, while short-term, are indeed necessary maintenance activities which should not be delayed.
2. As the major challenge regarding solid waste management appears to be public behaviour, coupled with a lack of awareness regarding the impact of the current indiscriminate disposal practices on the environment, infrastructure and public health, a mix of social intervention and technology-driven/engineering solutions for solid waste management seem obvious and necessary.
3. An overall vision/strategy for the integration of primary, secondary and tertiary stormwater drainage canals and ditches in the citywide stormwater drainage system must be developed.

[35] SCE, *Volume 6 – Supplementary Appendix: Makassar City Report*, October 2019

4. Makassar City should identify and implement the best-possible and economically viable interventions from the variety of well-developed plans that have become available over the last decades.

Recommendations for execution of development scenario
Our recommendations are to:

- Commence necessary maintenance activities to improve the free flow of stormwater before the next wet season;
- Develop and implement a public awareness campaign regarding the negative impact of current public littering behaviour;
- Develop an overall vision/strategy for the integration of a citywide stormwater drainage system.

4.6 ELECTRICITY / ENERGY

4.6.1 Current pressures

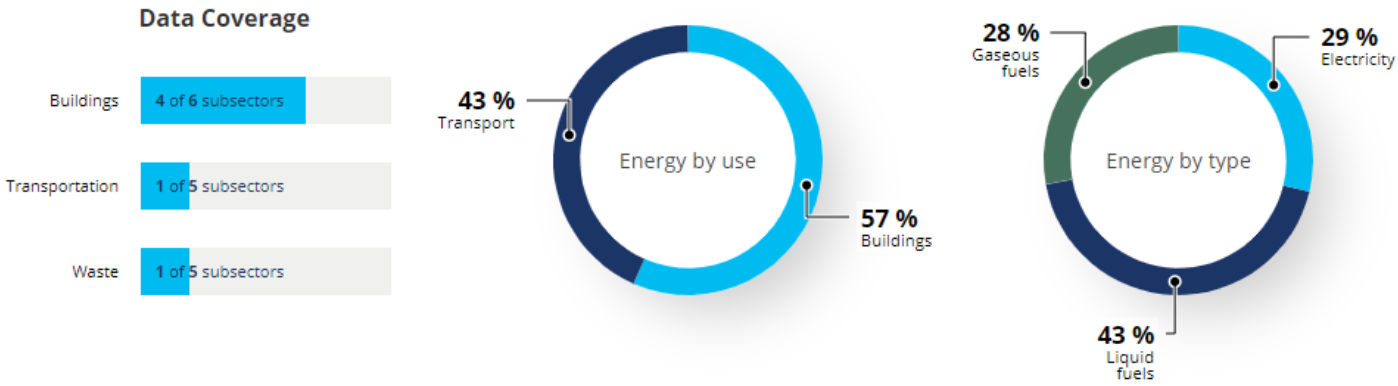
The majority of Indonesia energy is supplied by PT Perusahaan Listrik Negara (PT PLN) government-owned corporation. The energy sources are mainly conventional (fossil based), 95% and 5% renewable energy (RE). The contributions from conventional energy sources for electricity are 87.48 % while contributions from RE are 12.52% .

It is expected that by 2033 the electricity energy consumption in Makassar will enter into saturation phase. Makassar needs to reduce the dependence on conventional sources and shift to renewable energy sources.

Approximately 42% of the energy is used for transport, which is the main contribution to air pollution. Supply of public transportation is not in accordance with the demand. 57% of the energy is used for buildings. To reduce the energy consumption by the residential sector would be important to develop energy efficiency policies (energy levels).

From the energy sector, one-third of the emissions come from residential sector (direct emission form liquefied petroleum gas / LPG for coking) and indirect emissions (grid electricity consumption). Transportation sector contributed with 26% (fossil fuels burned). Industry sector contributed with 16%. Commercial sector contributed with 15%.

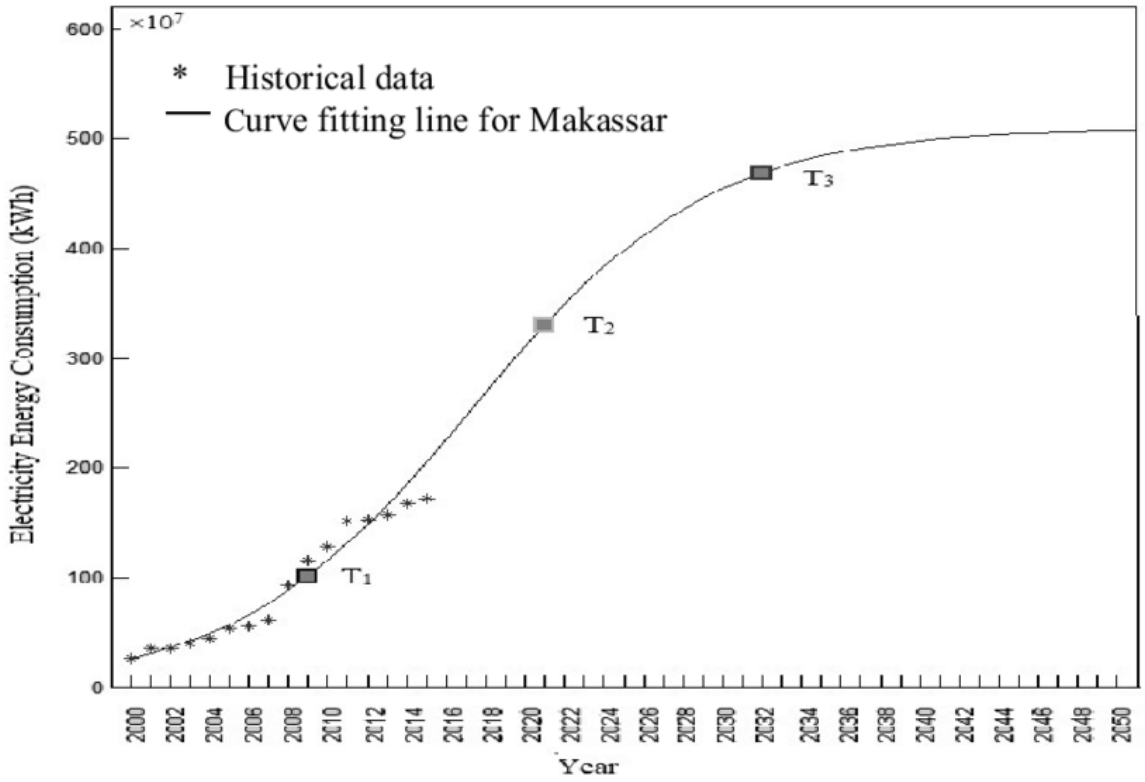
Figure 20: Makassar energy data for 2017



4.6.2 Needs and development plans

Electricity consumption in Makassar has been increasing from 263 million kWh in year 2000, to 1,719 million kWh in 2015. Knowing future energy (electricity) demand is important to achieve optimal development of existing power grid and management.

Figure 21: Typical LCM for electricity energy consumption in Makassar [36]



[36] Akil et al., 2019

Akil *et al.,* 2019 investigates the saturation period of electricity consumption in Makassar using logistic curve approach. Figure 21 shows three phases (T) of electricity energy consumption growth:

1. Slow / flat growth in year 2009 (T1)
2. Rapid growth in year 2021 (T2)
3. Saturation growth in year 2032 (T3).

Prediction results shown electricity energy consumption in Makassar will enter into saturation condition from year 2033 with expected consumption volume of 4,748 million kWh. Presented information can contribute in developing more effective power grid in Makassar to keep optimal electricity service to consumers in the future.

4.7 URBAN MOBILITY AND TRANSPORTATION

4.7.1 Policy, law, and regulation

Existing programs to improve mobility in Makassar include:

- Makassar City Regional Regulation Number 4 of 2015 concerning Makassar City Spatial Plan 2015-2034, which includes:
  - Regulation regarding urban railway network system
  - Integrated land-water transport network
  - Integrated and hierarchical intermodal transportation system
  - Integrated system for pedestrian, people with disabilities and bicycles (arterial and collector road network)
  - Overpass system on important nodes of the city
- Makassar city government together with Deutsche Gesellschaft Internationale Zusammenarbeit (GIZ) is currently working to re-operate the BRT.
- Makassar City Information System agency (Dinas KomInfo) has a similar project underway called *Smart City Plan* which includes a range of digital and smart technological solutions for Makassar transportation, including:
  - Area Traffic Control System (ATCS) additions
  - CCTV addition
  - Improvement of public transport management system
  - Route information system and electronic schedule of public transportation
  - Public transport payment system using single fare card
  - Intelligent Transportation System (ITS) application
  - Safety and vehicle control system
  - Smart parking solution.

Key characteristics of current public transport regulations include the following:

- Microbus licenses are issued by city transport agency and valid for five years and extendable. Annual re-registration is needed during the validity period.
- Microbus licenses can be granted by direct appointment or tendered in a limited or open manner.
- Microbus fares are regulated by the government, i.e. through Mayor Regulation.
- Due to the emergence of application-based taxis in Indonesia, the Ministry of Transport has issued regulation on the fare rates for this mode. The regulation sets minimum and maximum rates including minimum fees charged based on zone.

Figure 22 illustrates the range of existing public transport modes within Makassar.
Public transportation in this study covers all transportation services that is available publicly, regulated by the authority/government and have legal representative. Alternatives that run without license nor have organisation are considered informal transportation.

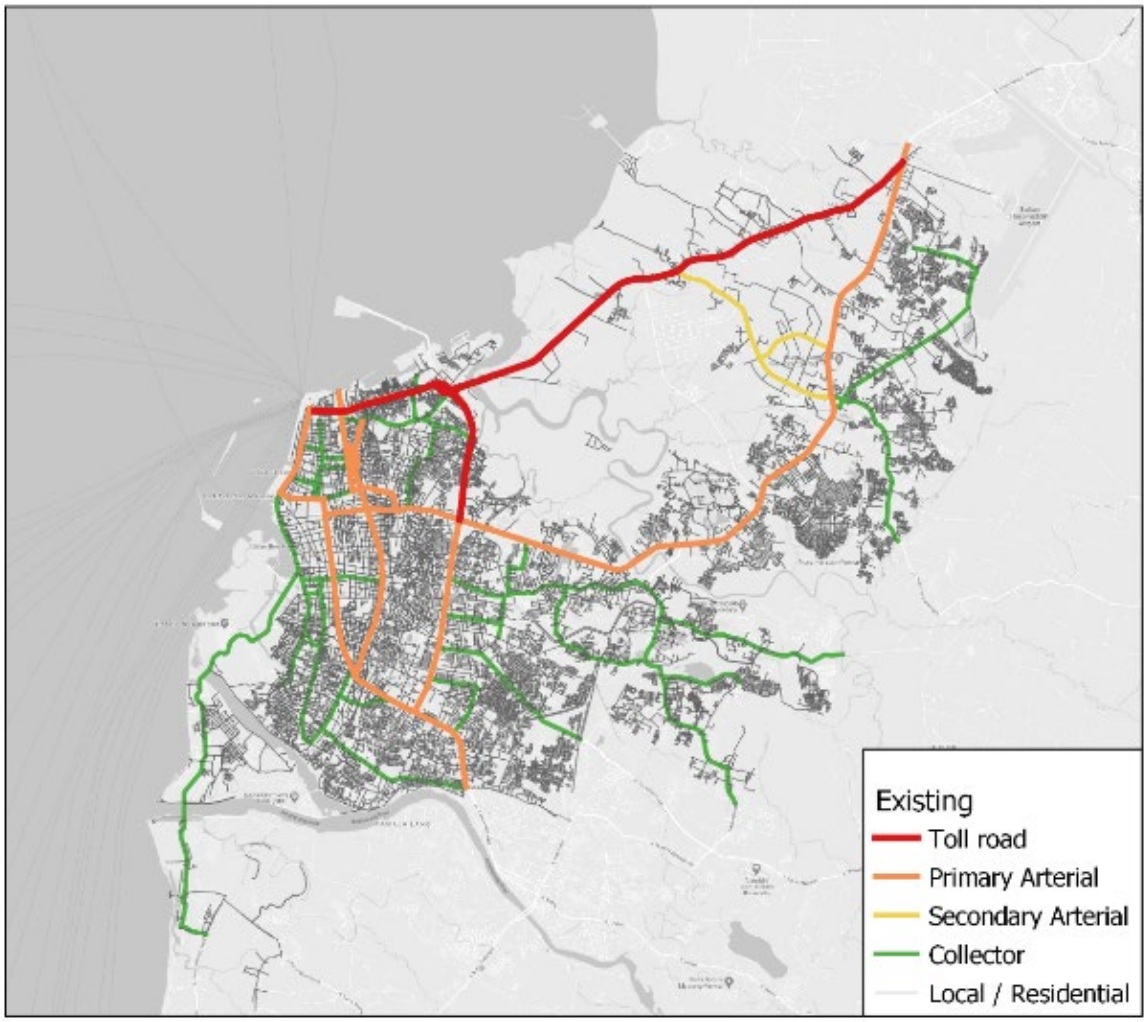
Figure 22: Makassar City's Public Transport Overview

4.7.2 Existing service delivery situation

Existing road infrastructure

In general, the road network system in Makassar City has linear pattern that connects the central area of Makassar City in the western part of Makassar city with other parts of the city in the southern and eastern parts of the city. In the southern and eastern areas of the city, which are generally residential areas, road patterns use a grid system.

Figure 23: Makassar City Road Network Map Based on Road Functions



Public transportation facilities operating in Makassar City currently consist of microbus (pete-pete), Bus Rapid Transit (BRT), online application-based transportation (grab, gojek and maxim) and informal transportation.

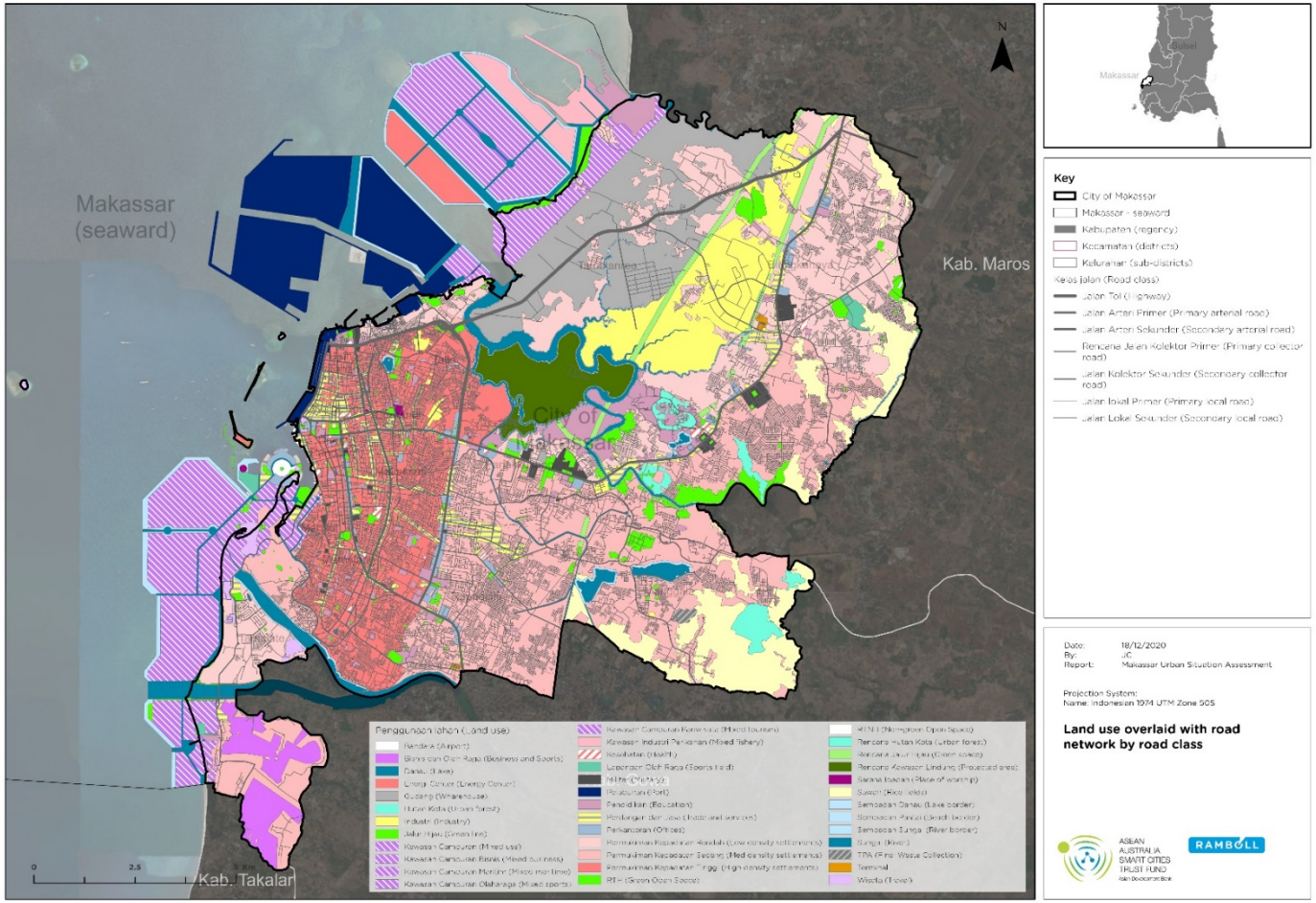
According to the statistical office of South Sulawesi province, in Makassar city there are 1,337,738 vehicles in 2015 and 1,574,385 vehicles in 2018, an increase of more than 5% annually. From the total number of vehicle in Makassar city, more than 70% are motorcycle. The high growth especially in motorcycle ownership is influenced by the increase of level of income of the people as well as the ease in obtaining motor vehicle loans with a low down-payment. The number of vehicles by type in South Sulawesi can be seen in Table 6.

Table 10: Number of Vehicle by Municipality/City for South Sulawesi 2018 [37]

Municipality / City	2018				
	Vehicle Type				
	Car	Bus	Truck	Motorcycle	Total
Bantaeng	1,777	103	1,449	27,386	30,715
Barru	3,360	9	1,876	42,788	48,033
Bone	7,849	3,687	7,464	167,270	186,270
Bulukumba	8,132	341	5,671	101,803	115,947
Enrekang	2,112	44	1,866	41,933	45,955
Gowa	20,118	202	9,996	240,772	271,088
Jeneponto	3,606	211	3,181	42,534	49,532
Kepulauan Selayar	831	73	385	17,883	19,172
Luwu	4,901	41	2,659	105,403	113,004
Luwu Timur	6,146	269	4,802	99,011	110,228
Luwu Utara	2,641	17	2,372	76,878	81,908
Maros	7,422	53	3,588	68,933	79,996
Pangkajene Dan Kepulauan	8,462	70	4,742	92,253	105,527
Pinrang	10,440	33	6,001	170,133	186,607
Sidenreng Rappang	8,104	172	5,140	94,743	108,159
Sinjai	2,501	141	1,632	51,457	55,731
Soppeng	3,724	1,294	4,288	59,684	68,990
Takalar	4,773	71	3,095	88,463	96,402
Tana Toraja	3,202	86	2,852	68,463	74,603
Toraja Utara	0	0	0	0	0
Wajo	10,625	74	6,759	133,472	150,930
Makassar City	**233,135**	**17,411**	**79,623**	**1,244,216**	**1,574,385**
Parepare City	15,149	55	9,674	99,895	124,773
Palopo City	6,100	109	2,911	90,124	99,244
Sulawesi Selatan	**375,110**	**24,566**	**172,026**	**3,225,497**	**3,797,199**

[37] https://www.bps.go.id/indikator/indikator/view_data_pub/7300/api_pub/150/da_10/1

Figure 24: Makassar Land Use, Overlaid with Road Network by Road Class



There are a lot of traffic between Makassar's islands and the mainland daily which is served by Kayu Bangkoa Port and Paotere Port (Figure 25). The attractiveness of the Makassar islands as tourist destination on top of commuting origins has put extra load put the water ways and the port. The transport system between the islands and the mainland has so far only been managed privately with poor infrastructure and service. As a lot of these movement is done using traditional and small boat, it is less likely that the movement is recorded correctly and included in the official record as shown in Table 11 and Table 12.

Figure 25: Makassar City Ports

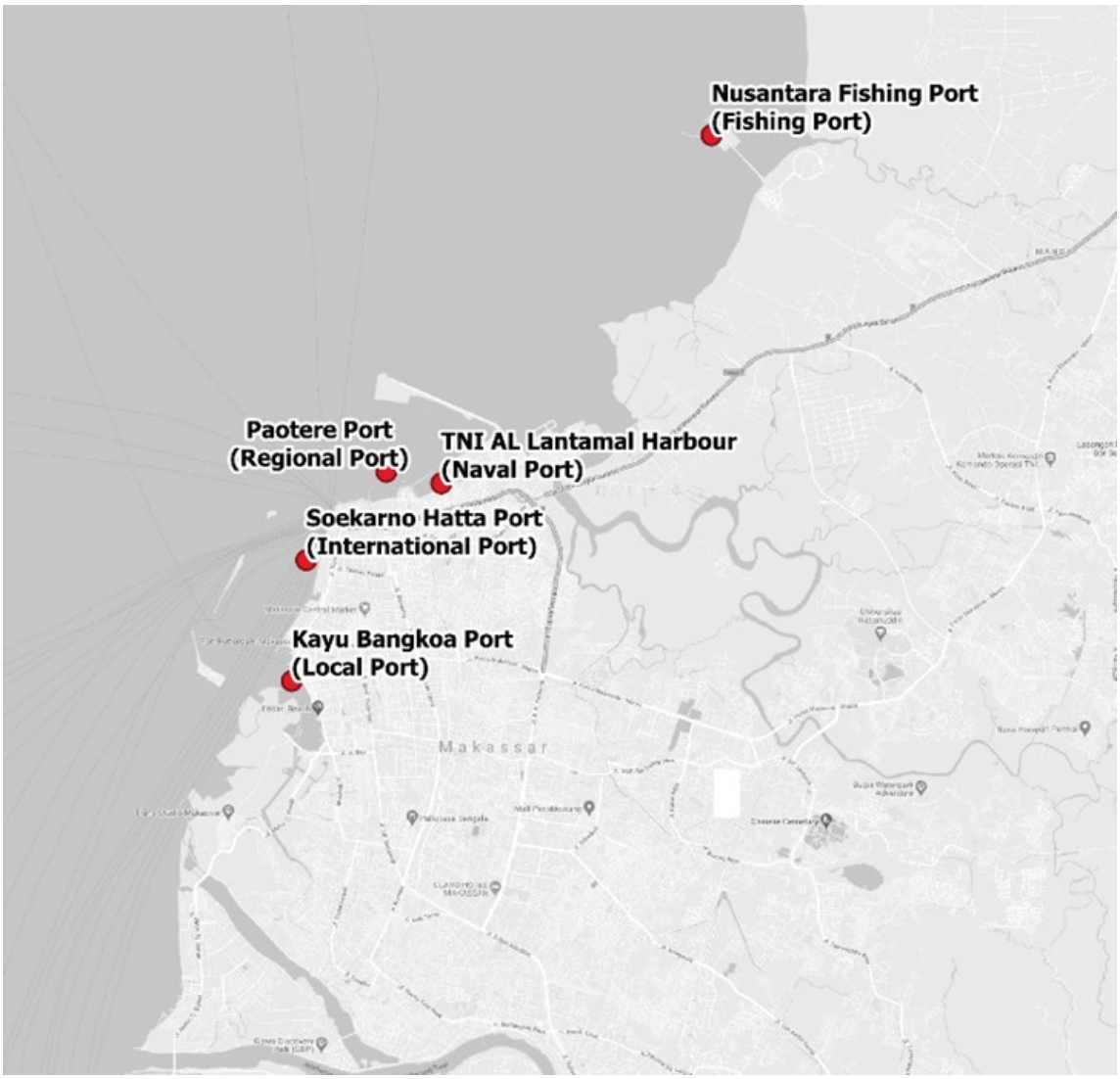


Table 11: Number of Ship Visits by Shipping Type, 2015-2018 [38]

NO	DESCRIPTION	YEAR			
		2015	2016	2017	2018
1	International	133	193	191	195
2	National	3,820	3,707	3,712	3.463
3	Special	382	458	541	538
4	Local	1,044	1,084	946	879
5	Others	108	8	0	0
	Total	**5.487**	**5,450**	**5,390**	**5,075**

Table 12: Number of passenger boarding and alighting at Makassar ports, 2015-2018 [39]

YEAR	BOARDING	ALIGHTING
2015	595,806	427,806
2016	482,177	373,519
2017	317,664	302,319
2018	312,019	287,487

4.7.3 Needs and development plans

The population of Makassar city during the day and at night is different. During the day, Makassar city transportation network is also burdened by the movement of people and vehicles from areas around the city of Makassar, Mamminasata.

Population growth and population density in Makassar city are not in line with the growth of its transportation system and network. Traffic congestion is one of the biggest transportation and mobility problems in the city. Development of the city-wide transportation network is not sufficient to support the level of population growth and population density occurring in the city of Makassar. This causes congested traffic conditions and reduced mobility in Makassar, which is detrimentally impacting on livability.

It is important that the transportation network supports accessibility for all residents and businesses. To maximise benefits to the community, government intervention may be required to change operator behaviours.

Land availability is an obstacle to implementation of existing and past plans. Right of way roads are inadequate to build BRT dedicated lanes making BRT more of a bus with a designated stop and not a rapid transit. Protecting transport corridors that are wide enough to cater for future growth is a key element of planning for future development.

An integrated and sustainable short-term and long-term masterplan or strategy is required to alleviate Makassar city mobility problems. Equitable and efficient transportation for all citizens, businesses and visitors are key elements of a livable and sustainable city.

The key elements of existing transport infrastructure and behaviours that influence urban mobility alongside potential interventions are described below.

[38] Source: Makassar City in figures 2019

[39] Source: Makassar City in figures 2019

Factors		Potential intervention
High vehicle ownership growth due to better economic condition and greater ease in obtaining loan than in past		• Road infrastructure upgrades to improve 'level of service' – road quality or pavement, number of lanes and evaluation of speed limits • Vehicles should pass initial and periodic test which includes both technical and operational requirement • Regulation, reclassification of road functions • Progressive taxation on private vehicle ownership
Two-wheels motor vehicle dominate up to more than 70% of the total vehicle in Makassar		
Limited pedestrian and non-motorised infrastructure		• Encouraging greater investment in infrastructure to support non-motorised transport, including closing certain roads to vehicles (certain days and certain hours) and greater number of separated pedestrian and cycle paths • Facilities that provide security, safety, order and smoothness of travel
There is a lack of facilities for people with disabilities both on the road infrastructure and public transport system generally		• Regulation of new infrastructure to provide more equitable access • Integration of equitable access into design of new public facilities, commercial/residential development and transport infrastructure.
Limited off-street parking facilities		• Off-street parking solutions such as parking buildings or parking areas • Small-scale application of parking innovation and use of electronic parking metres
Microbus (pete-pete) dominates the "mass" public transportation system in Makassar though has poor level of service		
BRT Mamminasata currently operate only one corridor out of seven implemented corridors and requires segregated lane		• Good information system is needed, including route information, fare information, schedule information or provide even higher service by combining and utilizing system integration and provide a journey planner service
Online application-based taxis are widely used, but other than the regulation on fare by the central government, no in-depth evaluation or regulation exist		
Significant traffic between Makassar's islands and the mainland, serving both commuters and tourists, with inadequate integration and facilities		• Formulation of a bespoke strategy to deliver efficient and effective water-based transport covering scheduling, integration and supporting facilities

4.8 DIGITAL PENETRATION

4.8.1 Policy, law and institutional arrangements

The legal basis for a smart city in Indonesia is law no. 23 of 2014 by the local government in Chapter XXI entitled regional innovation from Article 386 to Article 390. [40]

Various legal foundations have been issued by the Makassar City Government related to the implementation of Makassar Smart City program (Volume 12: Smart Infrastructure provides a description of the regulations). [41] Refer to Section 2 of this report for a description of the current Makassar Smart City program.

As the lead offices on the Smart City program, Bappeda and KomInfo aim to integrate data from all sectors into the war room dashboard. Some department data are shared with the war room dashboard, including population data from the civil registration office, DHIS-2 data from the health office, real-time drug distribution data, the number of hospital beds available, the number of queues at clinics from city hospitals, data from the Regional Office of Manpower, trade data, and data from the Environmental Office. In the future, all sectors will be encouraged to share their data with the war room dashboard.

KomInfo has recently developed an ambitious roadmap for the next smart city initiatives in the city's smart city program. This roadmap is focusing on smart and digital technologies and reflects the vision on implementing new technologies to enhance the sectors healthcare, security and mobility beyond 2020. [42]

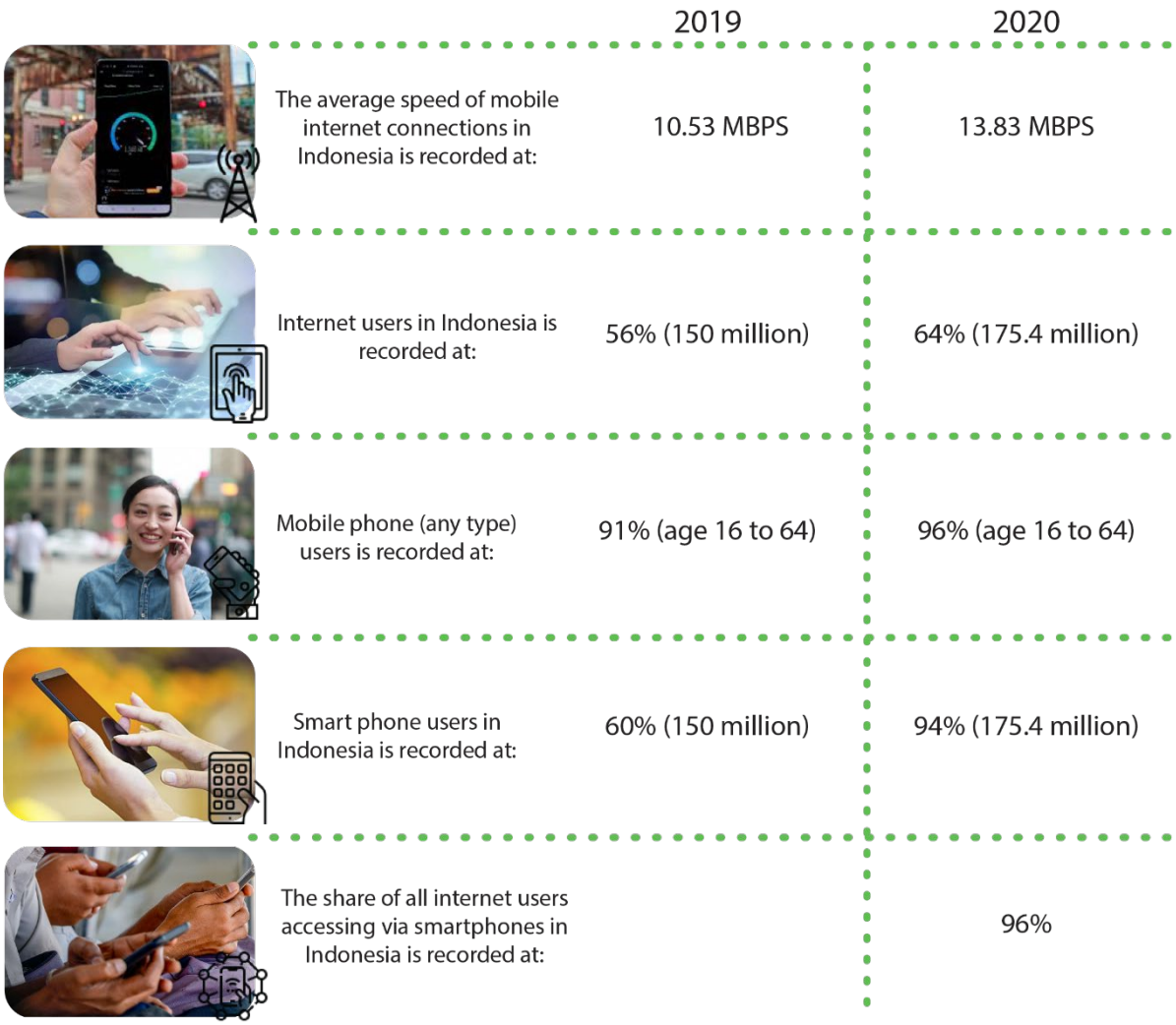
4.8.2 Internet access

The internet has become an important tool for people to access information and many governments have as an example used digital platforms such as social media platforms, e-mails, SMS, online government portals etc, to share timely and accurate important information about the recent COVID-19 pandemic.

The percentage of smart phone users nationwide have increased substantially from 60% in 2019 to 94% in 2020. Internet connectivity has similar increased substantially over the same period, with the share of all internet users accessing via smart phones recorded at 96% in 2020. This incredible growth in smart mobile penetration over the last year is largely attributed to increased mobile coverage (3G and 4G), affordability, consumer readiness and increased development of content and services in local language. [43] [44]

[40] Masterplan Makassar Smart City Baku III, Executive Summary Masterplan Smart City Daerah, DisKomInfo Makassar
[41] Masterplan Makassar Smart City Baku III, Executive Summary Masterplan Smart City Daerah, DisKomInfo Makassar
[42] KomInfo Kota Makassar, Plan for Makassar smart city beyond 2020 (2020)
[43] We are social and Hootsuite, Digital 2019 Indonesia (2019)
[44] We are social and Hootsuite, Digital 2020 Indonesia (2020)

Figure 26: Digital Penetration in Indonesia from 2019 to 2020 [45]



4.8.3 Infrastructure

Approximately 80% of customers in the service area have been reached by the fibre optic network. Including areas with an archipelago classification, even in the city of Makassar, almost 100% of the area can be reached by fibre optic networks.

Sulawesi is one of the regions that has improved the connectivity to e.g. 4G services with now having smart phone users connected to 4G 9 out of 10 times. [46] Makassar is one of the cities in Indonesia which is getting ready for Broadband Wireless Access (BWA) realizing the target speed above 100 MBPS and the 5G era.

In remote areas, such as Langkai Island, which is two hours by boat from Makassar, basic infrastructure including information technology, phone signal, electricity, health care, and water installation were not sufficiently available. People living on the island placed signal boosters on their phones to access information from television, radio, and mobile phones. [47]

[45] We are social and Hootsuite, Digital 2019 Indonesia (2019); We are social and Hootsuite, Digital 2020 Indonesia (2020))

[46] https://www.opensignal.com/2020/11/26/palapa-ring-has-successfully-improved-mobile-connectivity-in-remote-indonesian-islands [Accessed 18-12-2020]

[47] USAID and JSI, Building Healthy Cities – Makassar Data Use and Access Assessment (2019)

For the mobile network infrastructure in Makassar, there are currently 5 major operators, namely Telkomsel, Smartfren, Indosat Ooredoo, XL Axiata and 3 Tri. The largest area coverage is owned by the operators Telkomsel and Smartfren, almost having 100% coverage, while Indosat, XL and 3 have coverage of 90%. Currently, the technology that has been supported is 4G and 4G+.

To support the future demands of network capacity in Makassar, the network capacity needs to:

- Supports 5G implementation (access speed currently only 5-60 Mbps)
- Be enabled by a large capacity (capacity 1000 Tb) data centre to support government service automation systems
- Consider green communication in order to use renewable energy resources such as power solar, wind, battery storage on base station and relay.

4.8.4 Needs and development plans

The key challenges facing Makassar in delivering greater access to smart technology and digital solutions for its citizens include:

- The biggest problem of smart city program is the software or application programs are not integrated in one department with another. Each department develop application and have their own, making it difficult to collect data as a whole
- Another challenge is that it is difficult to integrate the software of each related department because it has not been regulated in a regulation
- Makassar City Government want to develop a technology that can integrate all government offices in Makassar with cost-efficient and good programs
- Henceforth, the government wants to make "one door data" in one smart application
- Access to ICT is limited among residents living in slum areas and from low-income families. Mobile phones are typically used for personal communication and are rarely used to find information and public services.

5. HUMAN CAPITAL: WELL-BEING AND LIVELIHOODS

5.1 HEALTH AND SERVICES

In terms of health, Makassar is trying to innovate in providing health services to vulnerable groups through home care facilities. However, this service is at an early stage with constraints in resources and adequate health workers.

The Makassar Health Office coordinates the operation of services of 29 General and Special Hospitals, 21 Maternity Hospitals, 44 Public Health Centres (Puskesmas), 30 Auxiliary Health Centres, and 51 Medical Centres / Clinics that are spread over the 15 Kecamatan in the city of Makassar. In addition, the Health Office also coordinates activities in medical centres / clinics built and run by community / private institutions. Major functions of health office include: [48]

- Policy Formulation and implementation of government affairs in the field of health.
- Evaluation and reporting of government affairs in the field of Health
- Developing, coordinating, managing, and supervising of health programs and activities.

As of 2019, there are 29 hospitals, 21 maternity hospitals, 51 polyclinics, 44 public health centers in Makassar. [49] While Infant Mortality Rate in Makassar has fallen from 10.9% (2010) to 2.60% (2015), the Maternal Mortality Rate has increased from 11.60% (2010) to 20.33% (2015). [50] Indonesia has set specific targets for achieving universal health coverage by 2019. However, maternal mortality rate is still high and remains a critical issue to address.

Makassar's high HDI means that social development polices have encouraging results. The first element that supports the improvement of HDI is the quality of health of the population (long and healthy life). Number of health facilities and health workers in Makassar is summarized in Table 13.

Table 13: Number of Facilities and Health Workers in Makassar, 2020 [51].

GENERAL HOSPITAL	29 UNITS
Maternity Hospital	21 units
Health Centre	74 units
Polyclinic	51 units
Doctor	203 people
Dentist	67 people
Nurse	379 people
Midwife	209 people

[48] Makassar Health Office, 2020
[49] Makassar municipality in figures 2020 – Central Bureau of Statistics , Indonesia https://makassarkota.bps.go.id/publication/2020/04/27/bc3a47054c386bac66a38333/kota-makassar-dalam-angka-2020.html.
[50] Ibid.
[51] BPS Office, 2020

The Indonesian health system has a mixture of public and private providers, and public and private financing. The Ministry of Health manages some tertiary and specialist hospitals, provision of strategic direction, setting of standards, regulation, and ensuring the availability of financial and human resources. Provincial and district government administer the public system in line with the decentralized government, they manage the level hospitals, provide technical oversight and monitoring of district health services, and coordinate cross-district health issues within the province.

District/city hospitals and community health centres and associated facilities are managed by the district/municipality governments. There are a range of private providers, including networks of hospitals and clinics managed by not-for-profit and charitable organizations, for-profit providers, and individual doctors and midwives who engage in dual practice (i.e. have a private clinic as well as a public facility role).

There are 46 units of puskesmas in Makassar City. A total of 12 health centres in Makassar City have inpatient services, while 34 other health centres have non-inpatient services. Basic health services for residents of Makassar City at puskesmas and their networks (sub-health centres and mobile health centres) are exempt from service fees including:

- Inpatient services for childbirth and general inpatient services
- Doctor's examination, medication, and health consultation
- Certain laboratory services
- Basic medical action (general medical action and basic oral dental treatment)
- Basic maternal and child health services and family planning
- Birth certificate
- Sick Letter
- Death certificate

To access the free service, residents of Makassar City need to show their KTP or family card and BPJS card.

Figure 27: 15-minute access to hospitals by motorbike in Makassar City

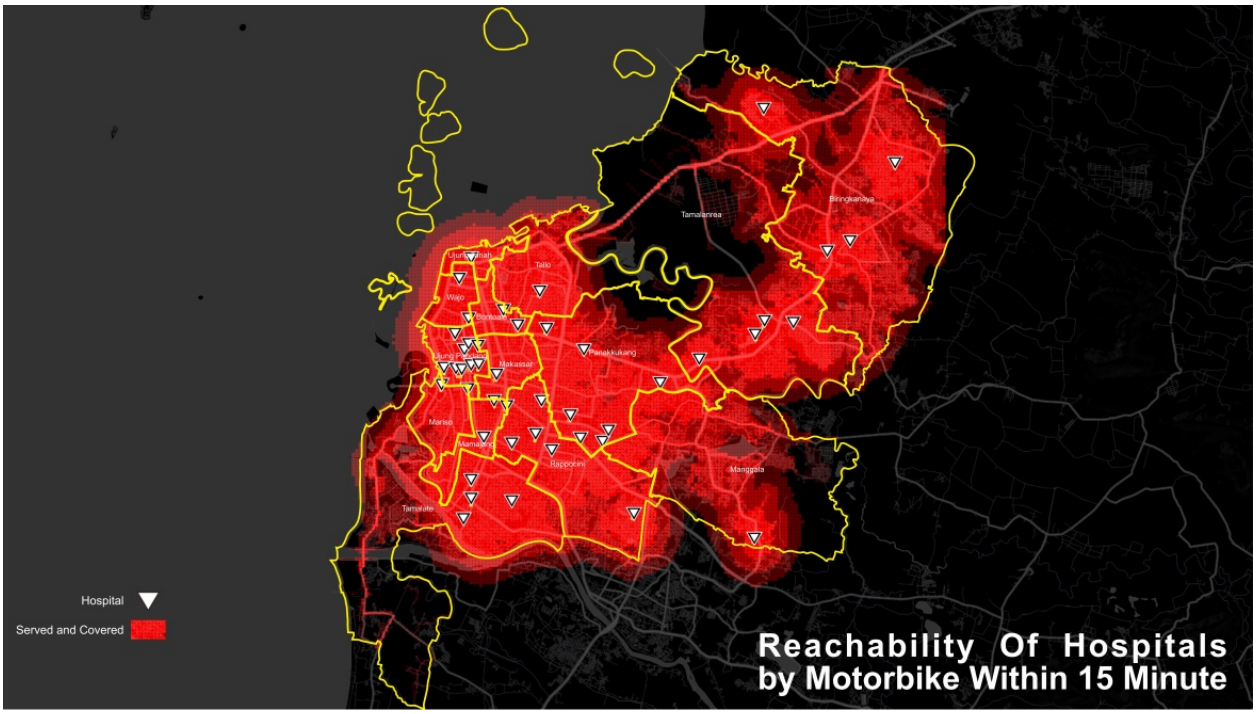
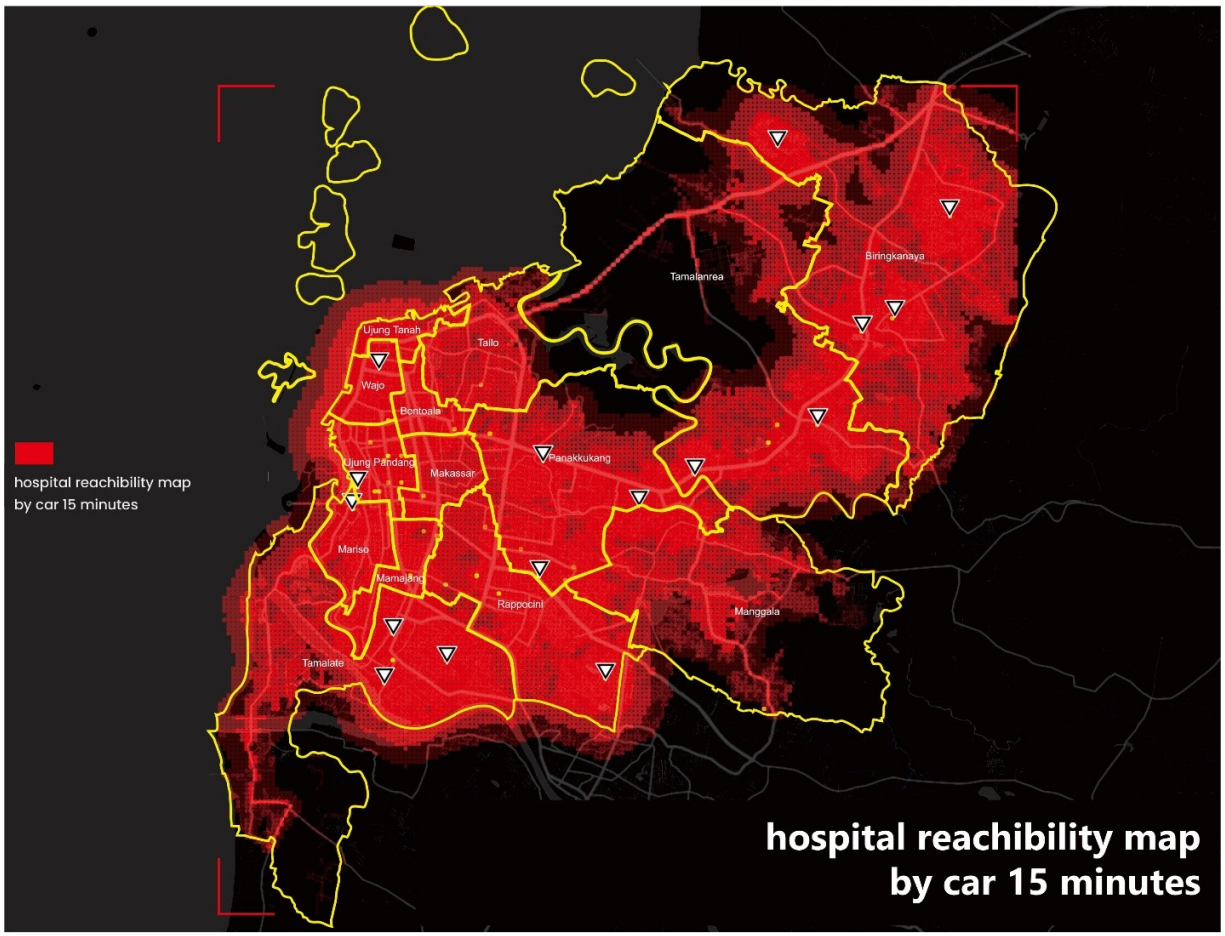


Figure 27 shows the accessibility of hospital facilities using a motorbike within 15 minutes. This shows that the Mariso, Mamajang, Rappocini, Ujung Pandang, Makassar, Bontoala, Wajo, and Ujung Tanah Kecamatan can reach their nearest hospital using a motorbike within 15 minutes. Meanwhile, some residents who live in Tamalate, Manggala, Tallo, Panakkukang, Tamalanrea, and Biringkanaya Kecamatan cannot reach their nearest hospital within 15 minutes by motorbike.

Figure 29 shows hospital reachability by car within 15 minutes, with some of the Kecamatan with the highest number of poor households having the least access to hospitals: Tamalanrea, Manggala, and Tamalate. These are also the areas of the city that are forecast to have the highest population per Kecamatan by 2014, highlight the need for better access to both health services for populations that are most marginalised.

Figure 28: Hospital reachability by car within 15 minutes



5.2 FOOD SUPPLY

5.2.1 Existing service delivery situation

The third element in HDI is a decent standard of living, relating to the economic conditions of the population, measured using average per capita expenditure. According to the latest data, Makassar citizens' spending patterns are trending upwards, characterized by a higher proportion of spending on non-food needs of 56.66%, compared to 43.34% for food needs (Table 14). This comparison is commonly used to measure the welfare of the community, namely non-food expenditures that are higher than food expenditure. Among the poor, spending on food is much higher in terms of family consumption, at about 70%. In the "Non-Food" expenditure, the largest percentage is for housing, various goods and services, durable commodities, and social needs. The average expenditure of Rp 1,513,095 per capita per month is above the poverty line in Makassar of Rp 418,831 per capita per month.

Table 14: Average Monthly Per capita Expenditure of Makassar Residents, 2020 [52]

TYPE OF EXPENDITURE	AVERAGE MONTHLY PER CAPITA EXPENDITURE	PERCENTAGE OF TOTAL
A. Food	Rp 655,712	(43.34 %)
B. Non-Food	Rp 857.383	(56.66 %)
Total	Rp. 1.513.095	(100.00%)

5.3 GENERAL EDUCATION

5.3.1 Existing service delivery situation

The Makassar City Education Office coordinates the management of schools at the elementary and junior high-level public schools. In addition, the Education Office also coordinates, supervises, and controls schools built by community institutions in the form of private schools. Some of the major functions of the City Education office are: [53]

- Formulation and implementation of policy government affairs in the field of education.
- Evaluation and reporting of government affairs in the field of education.
- Developing, managing, monitoring and supervising education programs and activities.

The HDI includes access to knowledge, with education being the key indicator thereof. School participation in Makassar has increased over the years, with net and gross participations rates summarized in Table 15. [54] Participation is close to a 100%, but this drops off at the high school level.

Table 15: Net and Gross Participation Rates by Educational Level in Makassar Municipality, 2018 and 2019

EDUCATIONAL LEVEL	NET PARTICIPATION RATES		GROSS PARTICIPATION RATES	
Elementary School	95,19	95,42	98,92	103,67

[52] BPS Makassar Office, 2020

[53] Makassar City Education Office, 2020

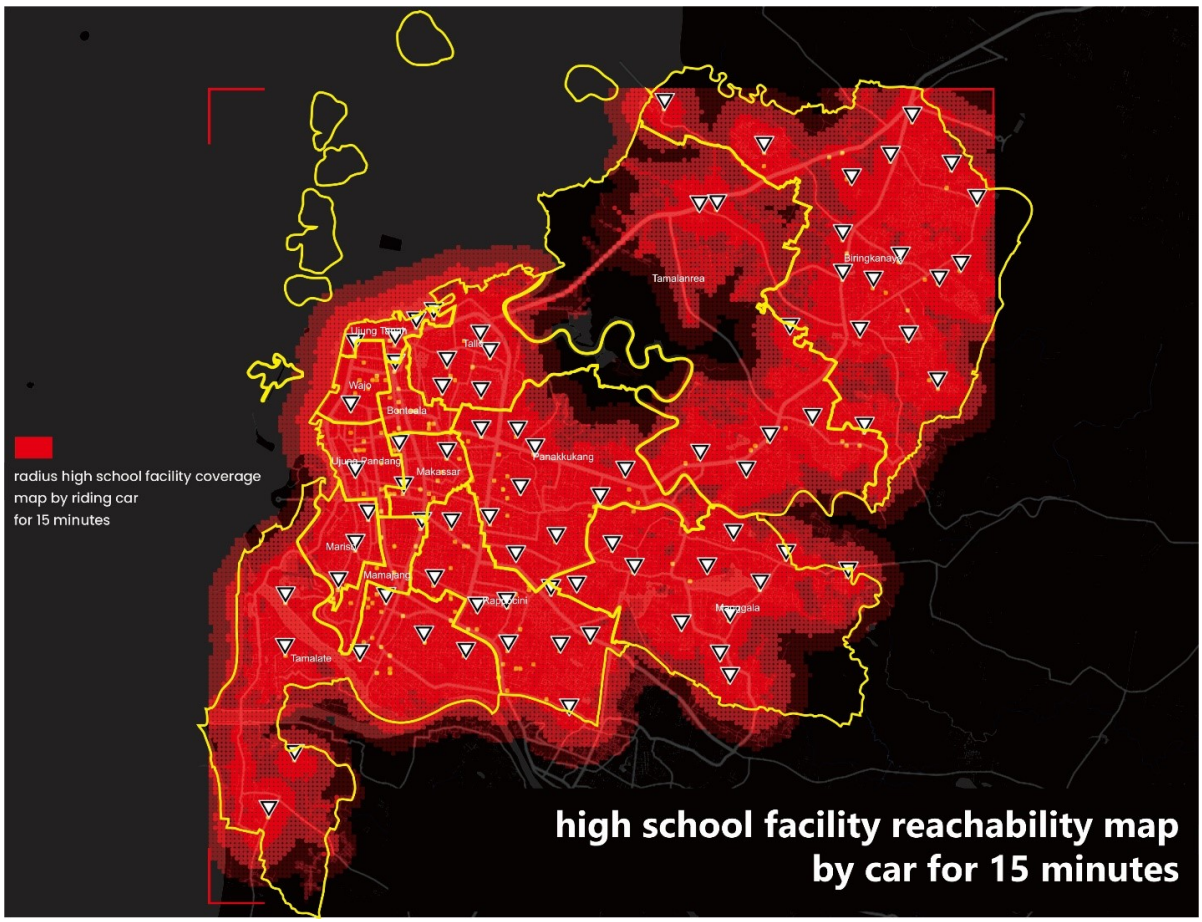
54 Gross participation rates refer to the number of students participating in a given level of education, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education (as opposed to net which refers to ratio of children participating in the official school age range for the given level of education).

Junior High School	77,71	79,29	92,25	91,93
Senior High School	60,65	59,41	71,91	90,11

There is a two-way causality between poverty and limited access to education - with education increasing human capital and thereby economic opportunities and competitiveness. In terms of education, children from poor and marginalized groups experience challenges in continuing their education beyond elementary school due to constraints in affordability and accessibility. Children from poor households tend to only attend education up to elementary school, with the imperative to work due to poverty prohibiting the ability to pursue further education.

Due to low levels of education the local job opportunities available are in the informal sectors, such as farm laborers, construction work, driving cabs, and in the fishing industry. Incomes in these sectors tend to be low and associated with higher levels of uncertainty. Hence the cycle of low education attainment and engaging in (often informal) work at low wages continues through generations.

Figure 29 High school reachability by car within 15 minutes



5.3.2 Needs and development plans

In developing the quality of Human Resources (HR) and increasing the Human Development Index (HDI), improvements to education are vital in preparing the next generation and determining the quality of life and economic prospects for residents of Makassar. The educational demand can be derived through the provision of educational facilities in accordance with the number of people, starting from the kindergarten, elementary, junior high and high school levels so that the provision of education can be evenly distributed to all groups and any gaps in the supply of education facilities can be identified for each Kecamatan.

Table 16: Education facility demand projection for Makassar city 2021-2040 [55]

PROJECTION YEAR	POPULATION	EDUCATION FACILITIES DEMAND MAKASSAR CITY			
		Kindergarten	Elementary School	Junior High School	Senior High School
2021	61482	-612	-436	-53	-184
2025	63285	-76	-122	-16	-16
2030	65539	-76	-60	-15	-21
2035	67793	-80	-48	-20	-20
2040	70047	-78	-64	-22	-21
	Total	-846	-670	-111	-242

From the analysis result of the need for educational facilities in Makassar City in 2021-2040, it is found that all the facilities have to add the number of Kindergartens by 846 units, elementary school facilities 670 units, junior high school facilities 111 units and high school facilities 242 units.

[55] Makassar Central Statistic Agency (2020) and projection analysis

5.4 ENTERPRISE AND LIVELIHOOD

Makassar's GDP is contributed by six main sectors, namely the wholesale and retail trade sector 21%, the processing (manufacturing) industry 18.5%, construction 18.2%, information and communication 9.3%, education services 9.1%, and financial services 6.5%.[56]

Makassar still has a low labour participation rate (particularly among women) and high unemployment rate, causes of which include a lack of labour-intensive industries and poor availability of various skill training programs.

As in many ASEAN cities, informal markets and street vendors are considered as "the backbone of the economy", and Makassar is no different. Street vendors account for the largest labour force in Makassar. They also contribute significantly to local revenues of Makassar, considered to be around 35% in 2016. Local Government through the Department of Cooperatives is responsible for vendors through the provision of counselling about the beauty of the city, hygiene and traffic order. The Department of Cooperative together with the Department of Trade is noted to provide training on financial management and how to gain access to the bank to vendors. Activities have also included outreach on trade licenses and obligations of the vendors. Key challenges around street vendors in Makassar include lack of dedicated spaces for these activities to occur safely, impacts of vendors on traffic (resulting in traffic jams), security for vendors in their trade activities (both personal security – particularly for women, and security of tenure / access in market spaces), and need for ongoing and upscaling of City support in relation to financial management and banking services.[57] A key theme, therefore in developing Makassar as a smart city is in supporting both the City government and vendors develop the sector to better meet the needs of the growing city.

To maintain a diverse economic base, support should be provided for both the formal and informal economy. Skills, particularly of slum residents, often do not meet the requirements or demands of the formal employment sector. Implementation of Work Skills Training Centers in sectors identified for growth / development, especially for young workers from poor families and other marginal groups is an important poverty reduction strategy for the city. This should also encompass programmes to foster children pursuing education beyond the primary and elementary phases.

5.5 SOCIAL PROTECTION

5.5.1 Poverty in Makassar

There are many different ways to measure poverty. For Makassar city development policies, several indicators of poverty in Indonesia are usually employed. This is because many ministries or central government offices have their own poverty issues or community empowerment programs, which need particular indicators. At a National level, official poverty statistic are published by the Central Office Statistic (BPS), based on the Poverty Line Standard: Measuring the monthly per capita expenditure for a number of food and non-food people daily needs.

The Ministry of Social Security, measures household poverty based on adequacy of household income to meet their daily basic needs for survival. The list of poor households are generally verified and supplied by the lowest level of government institutions. The BKKBN office measures family living standards based on adequate economic for daily life and social inclusion adaptivity.

[56] https://makassar.tribunnews.com/2020/11/16/arah-perekonomi-makassar-dalam-pusaran-pilwali-2020

[57] Bebasa, R. et al. 2016. Mechanisms in the Formulation of the Management Policy in the Informal Sector in Makassar Mediterranean Journal of Social Sciences. Vol. 7. (3).

The measure classifies family into three categories: Pre welfare, Welfare I, and Welfare II. The Pre and Welfare I are classified as poor families and become the main target for family planning and family development programs. The Ministry of Public Works measures community-based poverty, by employing the appropriate ratio of people or household needs for infrastructures and utilities. Measuring the general features of people's quality of life is the Human Development Index (HDI) that is now annually measured by the BPS and Bappenas at the district/municipality levels (and which has been referred to extensively throughout this Report).

Table 17 summarizes the number of poor people in Makassar and the percentage of the population between 2015 and 2019 (Makassar Municipality statistics based on BPS Poverty Line Standard). As per this data, the total number of poor people in Makassar was 65.120 in 2019.

Table 17: Number of Poor People in Makassar in 2015 – 2019 [58]

YEAR	NUMBER	% OF POPULATION
2015	63.241	4.38
2016	66.780	4.56
2017	68.187	4.59
2018	66.222	4.41
2019 [59]	65.120	4.28

However, the Makassar City Social Service categorizes poor households based on the eligibility of the households to government aid's scheme (e.g. Direct cash assistance, BPJS Contribution Assistance). In 2020, the Makassar City Social Service reported 82,331 households. Based on average number of 4 members per household, the number of poor people would be 329,324. Due to the two different methods of measuring poverty, the absolute number of poor people as per Makassar City Social Services is five times higher than that Makassar Municipality.

Poor households are located in all Kecamatan in Makassar (Figure 31). There are 6 Kecamatan with the highest number of poor households: Biringkanaya, Tamalate, Tallo, Panakkukang, Rapoccini and Manggala.

[58] Makassar Municipality in Figures, 2020

[59] South Sulawesi Share of poor population, 1970-2020 - knoema.com

Figure 30: Number of poor households in Makassar City by Kecamatan[60]

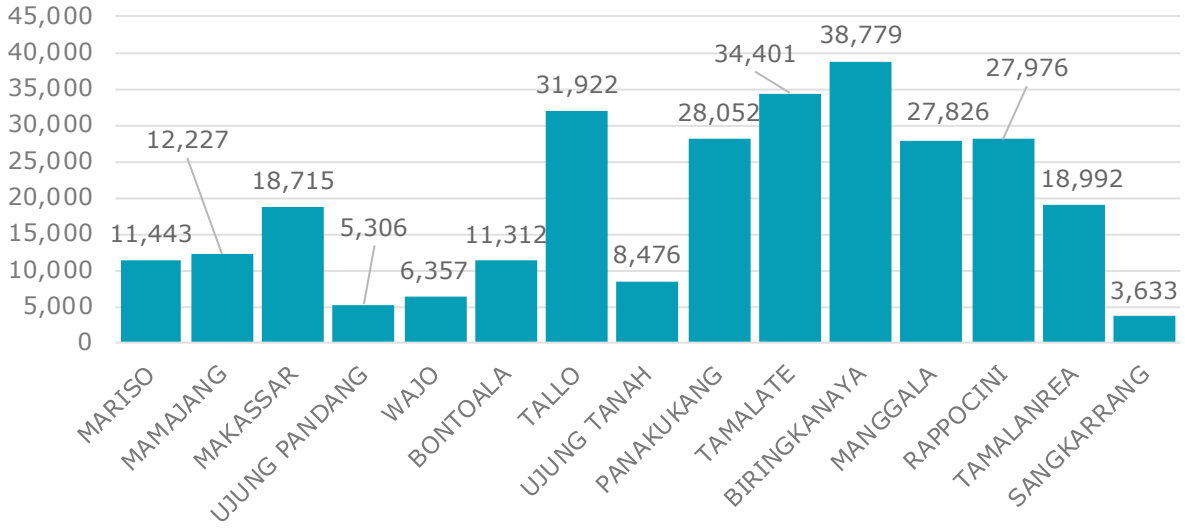
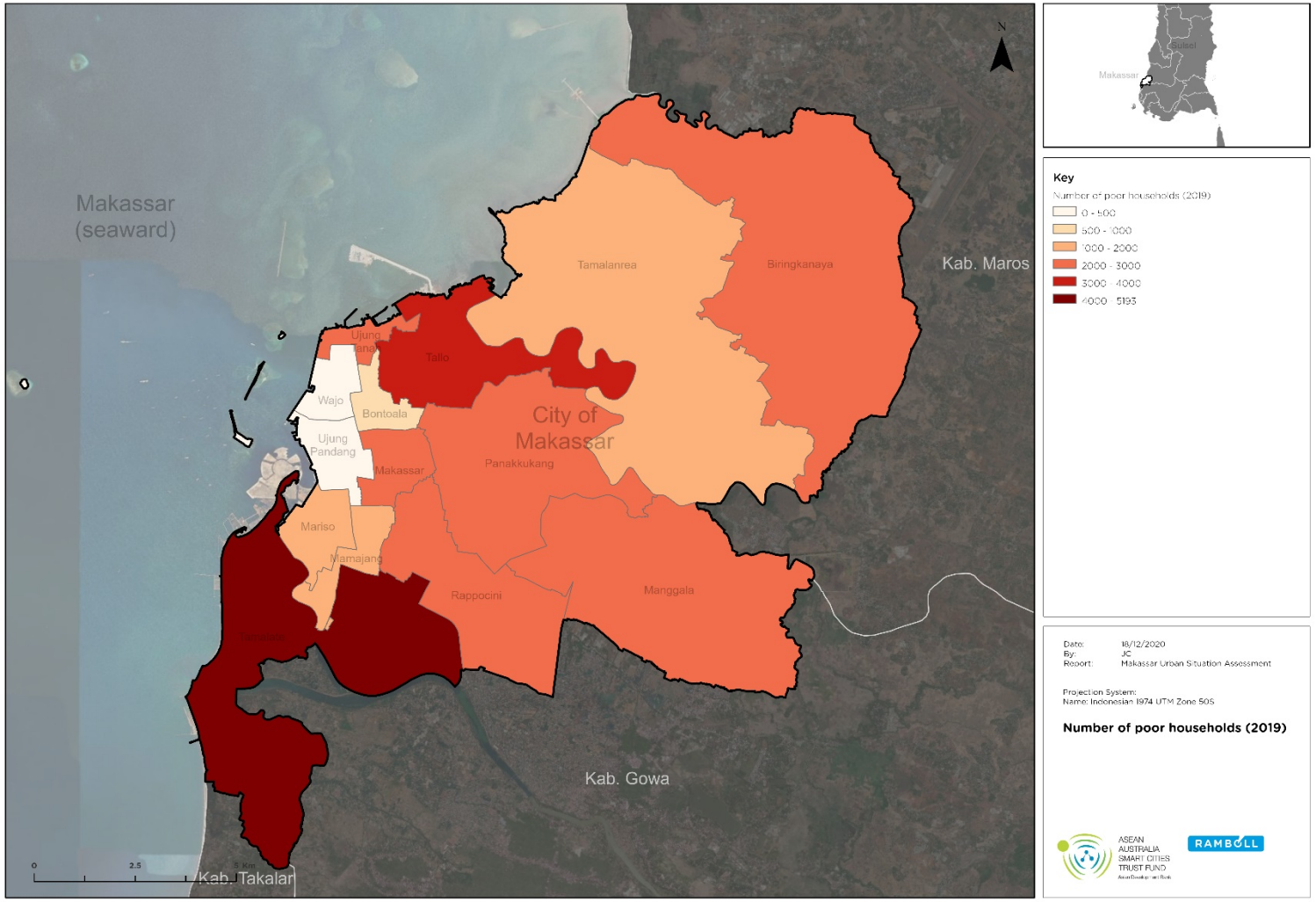


Figure 32 maps the number of poor households for each Kecamatan in Makassar for 2019.

[60] PK, 2019

Figure 31: Number of poor households (2019)



5.5.2 Existing service delivery situation

Social assistance programs are initiated for education (school assistance projects), income security for families with children (conditional cash transfers, scholarship programmes) and food provision (Raskin, a subsidised rice delivery programme). Expanding these programs to cover all vulnerable groups is a challenge [61].

Makassar City Social Service assists the Mayor in fulfilling the goals of social rehabilitation, empowerment and security. In the implementation of its activities, the Social Service partners with several community organisations or non-governmental organizations, that work with elderly care, abandoned children, economically vulnerable families, etc. Some of the roles of the Makassar City Social Service department include providing social security for people and women with disabilities, providing social services for elderly people who are displaced and fostering women in socioeconomically vulnerable situations.

Expanding capability and capacity to implement social assistance programmes and Musrembang processes, as well as increasing access to these programmes to cover all vulnerable groups should be a key priority moving forward. This includes streamlining approvals processes so that social programmes may be implemented efficiently to those in need.

[61] Kaasch, Alexandra; Sumarto, Mulyadi; Wilmsen, Brooke Working Paper Indonesian social policy development in a context of global social governance. UNRISD Working Paper, No. 2018-6

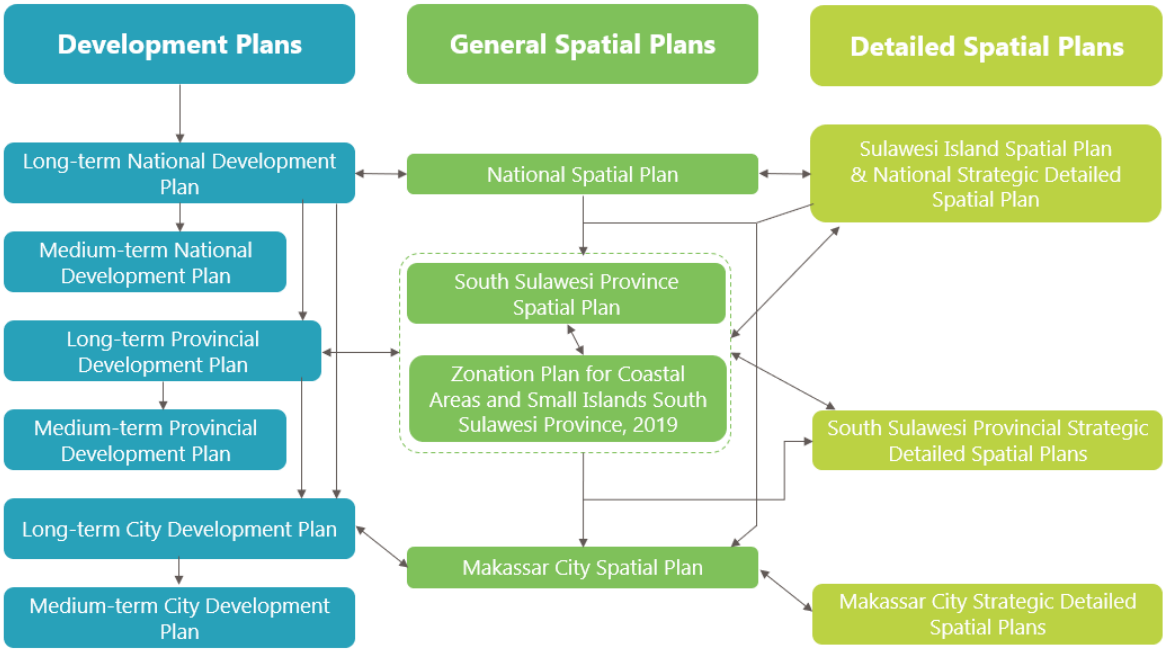
6. NATURAL CAPITAL: LAND, WATER, AND AIR

6.1 LAND USE PLANNING

6.1.1 Policy framework

Planning within the City of Makassar is regulated under Law Number 24 of 2014 concerning the National Development Planning System and Law Number 26 of 2007 concerning Spatial Planning. In theory, this allows for the development planning system to be integrated with the regional spatial planning system, both at the national and provincial levels as well as regions and/or cities. Figure 33 demonstrates the hierarchy of planning for the City of Makassar.

Figure 32: Hierarchy of Plans for the City of Makassar [62]



In practice, coordination and implementation of these plans is often slow, fragmented and complex. Development is carried out by the private sector in a market-driven approach, often ignoring social and environmental impacts and requirements.

The infrastructure investment required to implement development plans for the City of Makassar are not integrated under one framework with the same objectives and programs. There is a need for infrastructure coordination between the sector and government agencies to take advantage of

[62] Adapted from Regulation of the Minister of Agrarian and Spatial Planning No.1 of 2018 concerning Guidelines for Provincial, Regional and City Spatial Planning & Law No. 11 of 2020 concerning Job Creation

investment to get various benefits, optimize cost efficiency (long-term savings) and minimize disruptions during construction

The city has detailed expansion and development plans for public services, urban development and infrastructure delivery. However, these plans are increasingly unsuitable due to high population growth, the impact of climate change and the availability of the latest technological solutions. Thus, Makassar would benefit from a city-wide integrated framework that provides the basis for prioritising various interventions. The holistic urban framework would leverage cross-sectoral investments and programs, in order to respond to the challenges of urban growth, while at the same time creating opportunities for integrating technological solutions and addressing the negative impacts of climate change.

As the city's population grows over the next 20 years, the health and wellbeing of residents will rely on the ability to provide for formal employment opportunities that are well connected to safe and healthy housing – whether that housing is within the city or in the surrounding regions. Slum areas across Makassar present a range of health, social and environmental challenges due to a lack of infrastructure and resources to support wellbeing of residents.

Land use planning has a key role in addressing the growing demand for affordable housing, but also the provision of safe and healthy workplaces and street environments.

Street vendors can generate conflicts for users of footpaths and road users (between street vendors and pedestrians, cyclists, motor vehicle and motorbike riders and public transport users). Planning for a Livable City should address the role of footpaths and public space in supporting street vendors as well as the safety of other road and footpath users.

The recent population growth experienced in Makassar has contributed to the development of slums areas and growth in the informal economy. In the period between August 2019 and August 2020, the number of informal workers in the South Sulawesi province increased by 3.68% to nearly 2.6 million people (64% of the population) (Badan Pusat Statistik Sulawesi Selatan, 2020). It is likely that this increase may be partially due to the impacts of COVID-19, causing a reduction in formal employment opportunities. Nonetheless, the increase of informal workers would need to be considered in future development plans.

A major challenge for urban development in Makassar is addressing the complexity of urbanization, especially income inequality between cities and regions and the ongoing growth of informal settlements and slum areas.

As the number of people commuting from the surrounding regions or residential outskirts of Makassar increases over time, so too will the congestion of roads and corresponding air pollution from motor vehicle use. Aligning new housing growth with the provision of new public transport infrastructure, a renewed focus on Transit-Oriented Development (TOD) and exploring opportunities to locate new housing close to new job opportunities are some of the possible mechanisms for addressing these challenges.

6.1.2 Spatial Planning

Law No. 26 of 2007 on spatial planning is an important basis for the basic laws and direction related to spatial planning activities, the principle of spatial planning, the authority of the district government in the implementation of spatial planning, spatial products and hierarchies, as well as the limitations, scale and scope of spatial planning in urban areas.

Spatial planning is carried out to produce a general spatial plan and a detailed spatial plan. The General spatial plan consists of:

a) National Spatial Plan;
b) Provincial Spatial Plan; and
c) Regional Spatial Plan/ Urban and Regional/ Urban area strategic spatial plan

While the detailed spatial plan consists of:

a) Islands spatial plan/ islands and national strategic spatial plan;
b) Regional/ Urban spatial detail plan.

Figure 33: General Spatial Plan Relationship and Detailed Spatial Plan

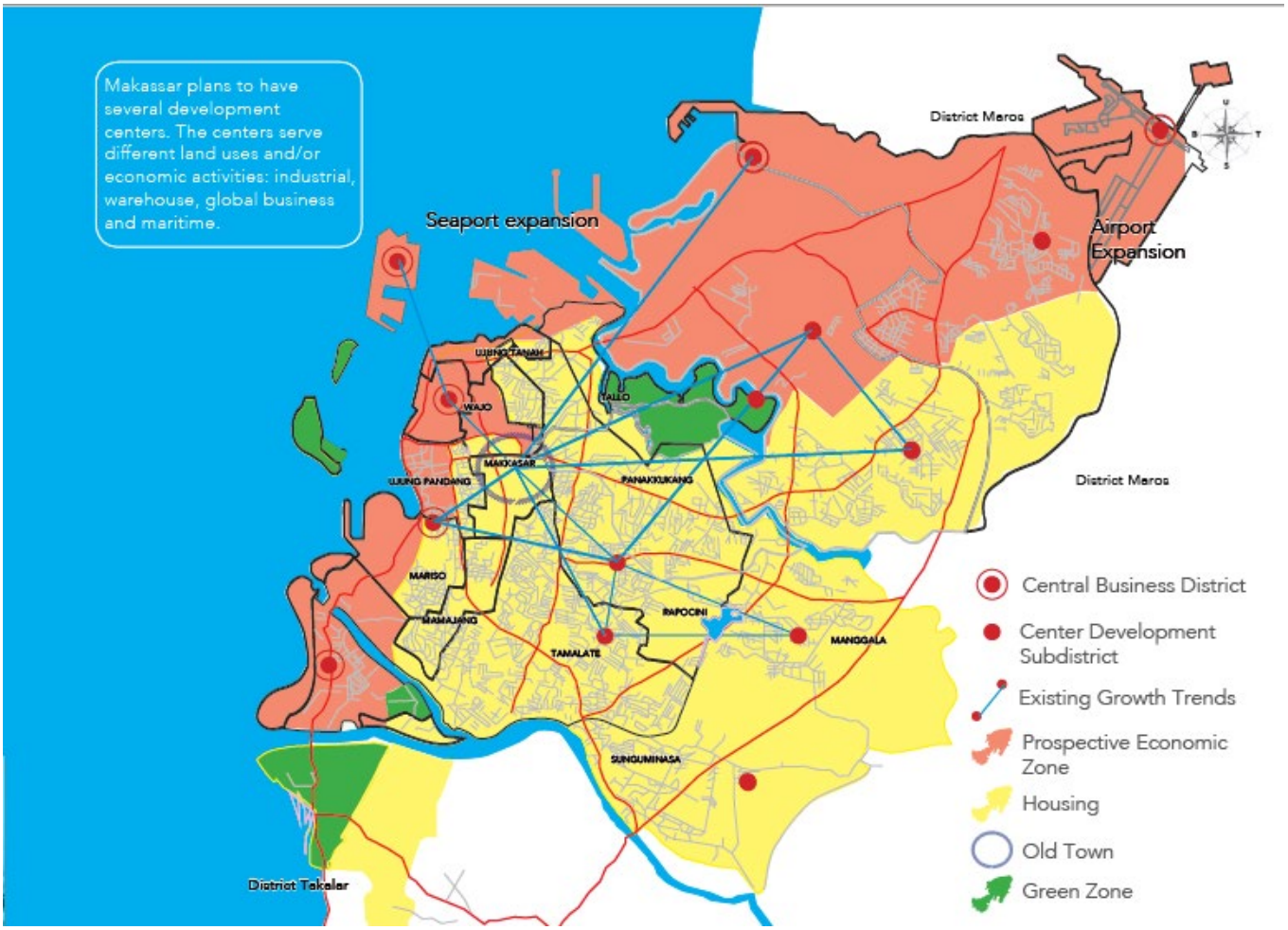
Based on municipal regulation number 04 of 2015, the Makassar City Spatial Plan (MCSP) 2015-2035 is to be officially used to direct and control urban development. However, to anticipate and adapt to the dynamics of development aspirations and changes in policies, plans and programs of the central government, both the provincial government and the Makassar city government itself and business activities, then based on Law no. 26 of 2007, the MCSP needs to be reviewed at least every five years after its creation. The following factors have led to the need for a comprehensive review of the Makassar City Spatial Plan:

- **External Factors:**
  - There are changes and / or improvements to regulations and / or spatial planning system references.
  - There are changes in national, provincial and / or city development policies that utilize space on a large scale.

  - The development of science and technology that is fast and changing the civilization of urban citizens who change the needs and utilization of regional space.

- **Internal factors:**
  - Lack of precise anticipation and adaptation of the City Spatial Plan (CSP) to the dynamics of development so that it is less effective as an instrument of providing opportunities, directing and controlling development location permits, so that it cannot optimize opportunities for economic growth, local, national and global socio-culture.
  - The lack of quality of the CSP can be caused by the accuracy of facts and the sharpness of the analysis that is anticipatory and adaptive to the dynamics of space utilization needs of the city area, because it is less innovative in following the development of Standard Norms Procedure Criteria in relation to urban spatial planning.
  - Limitations of human resources, instruments (use of IT) and costs in the system of directing and controlling space utilization based on CSP.

Figure 34: Makassar development profile [63]



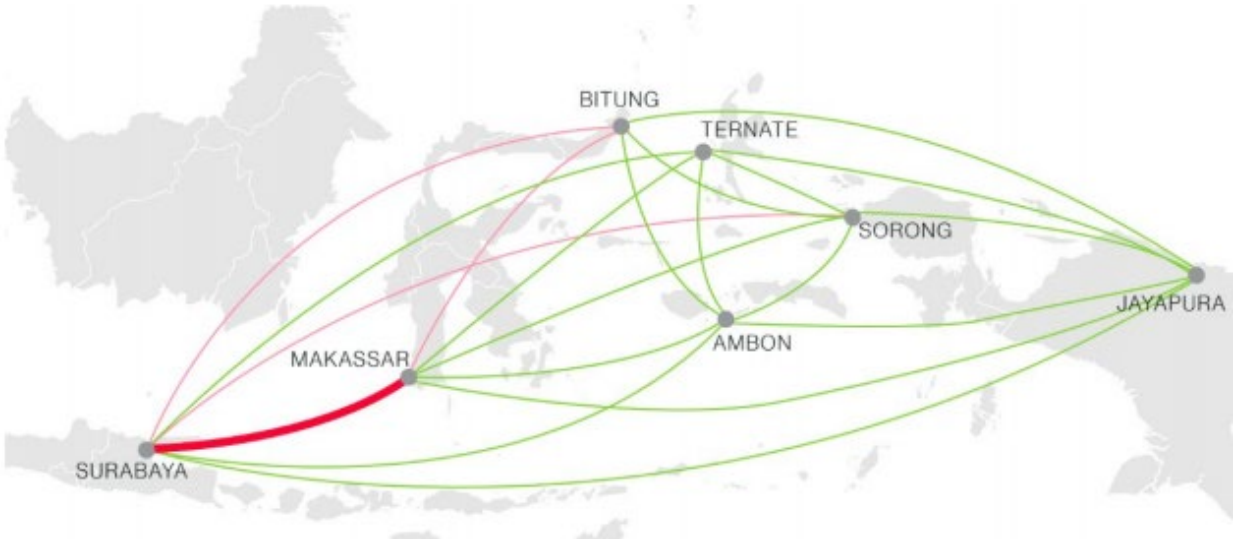
[63] Gunawan et al., 2015

6.1.3 Leveraging the opportunities from key urban developments as Makassar emerges from COVID-19

The Indonesian government is investing in significant infrastructure and developments in Makassar including the new Port of Makassar, a new rail line connecting the port towns of Makassar and Parepare which will eventually form part of the trans-Sulawesi railway line between the northern and southern ends of Sulawesi, and other major developments including land reclamation and a tourism precinct. The Hasanuddin Airport will also benefit from close proximity to the Makassar-Parepare train line and will undergo a four-stage development plan until 2044 to expand its capacity to 40 million annual passengers.

Once open, the new Port of Makassar will be a large container terminal for Makassar and serve as a major connectivity hub for the distribution of goods to Eastern Indonesia, leveraging the export opportunities from the ASEAN Economic Community. South Sulawesi has a strong export market in oily grains, medical plants, salt, sulphur, lime, fish and shrimp (The Australia-Indonesia Centre, 2020). The City of Makassar can leverage this investment in the new Port through improvements in export strategies including strategies to maintain price stability, improvements to the efficiency and reliability of logistics and distribution networks, utilising smart city technologies to improve the efficiency of port and distribution operations and planning for industrial land area for businesses that seek to benefit from close proximity to the new Port, rail line and expanded international airport.

Figure 35: Major connectivity hubs for distribution of goods to Eastern Indonesia [64]



[64] The Australia-Indonesia Centre, 2020

6.2 WATER AND NATURAL RESOURCES MANAGEMENT

6.2.1 Institutional framework

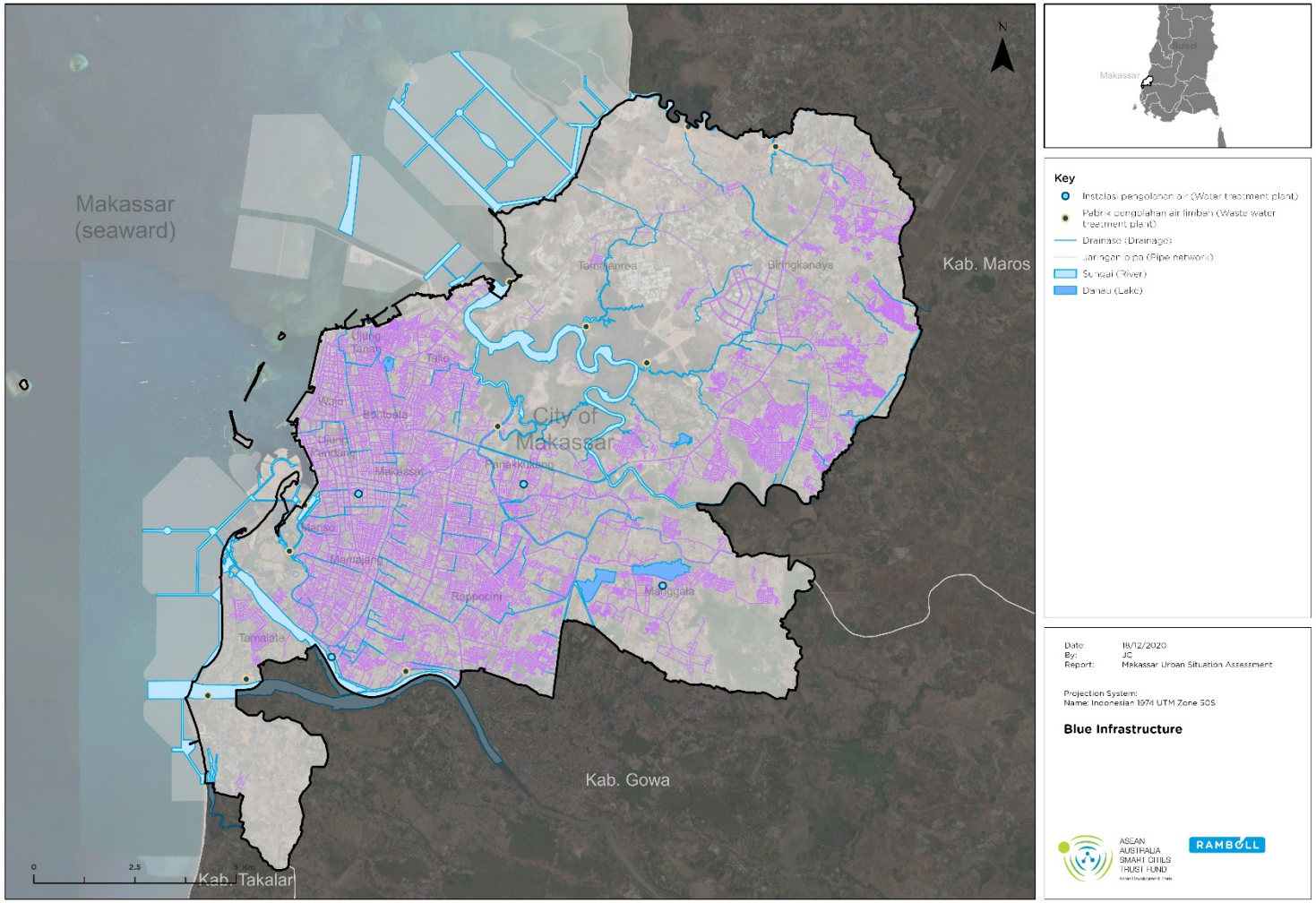
In Indonesia, a proper and healthy environment is considered to be a basic human right and a constitutionally protected right of every Indonesian citizen. Therefore, the Indonesian Government and all relevant stakeholders must protect and manage the environment by implementing sustainable development and environmental protection and management systems, to support the lifestyle and wellbeing of the Indonesian people and other living creatures.

The main authority responsible for environmental policy and enforcement is the Ministry of Environment and Forestry (MOEF). The Law grants regional autonomy to regional Government, Regional Environmental Impact Management Agencies (BAPEDALDAs) and local environmental agencies.

The Environmental Law adopts the ''polluter pays'' principle, under which each individual or company that causes environmental damage is responsible for the relevant actions committed. Therefore, in general, every person who is responsible for businesses or activities that cause environmental pollution or environmental destruction, and inflict loss to any other party or to the environment, must pay compensation or take certain remedial action (such as installing or improving waste treatment units, restoring the original environmental function or eliminating the causes of the environmental pollution or damage).

Figure 37 maps blue infrastructure in Makassar, including water treatment plants, wastewater treatment plants, drainage infrastructure, pipe networks, rivers and lakes.

Figure 36: Blue infrastructure



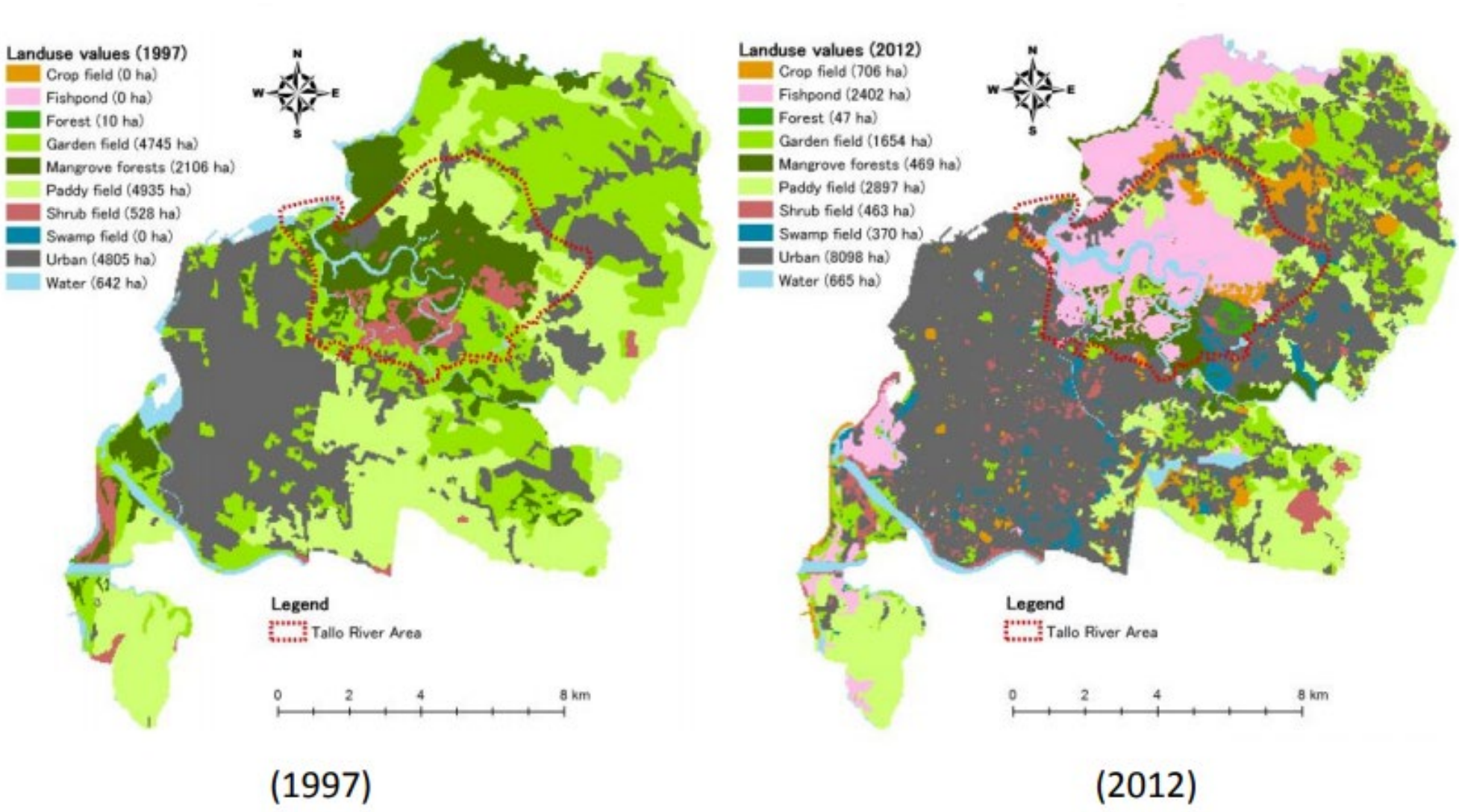
6.2.2 Current pressures

Makassar faces environmental issues, such as rapid changes in land use (including land reclamation) and climate change. In 2011, Makassar City received ASEAN's Clean Air for Big Cities Certificate of Recognition at ASEAN's Environmentally Sustainable Cities (ESC) Award program. This award is given to ASEAN cities that have remained clean, green, and liveable notwithstanding their growth as centres of economic and industrial activity.

Nevertheless, due to the increasing development activity and population growth, the environmental indicators for Makassar trend to decrease. Temperature has increased and rainfall has increases, as has rainfall intensity has increased, with rainy seasons shorter than in the past. Water and air quality are also being degraded as a result of unsustainable development and population growth.

The coastal city of Makassar has experienced a rapid urbanisation and it has been transformed into a metropolitan city in the last 15 years (Figure 38). Urbanization is directly related to economic growth and the expansion of the city towards urban suburbs and/or land reclamation activities (e.g. Centre Point Indonesia).

Figure 37: Development of land use in the Makassar region [65]



[65] Indrayani et.al., 2015

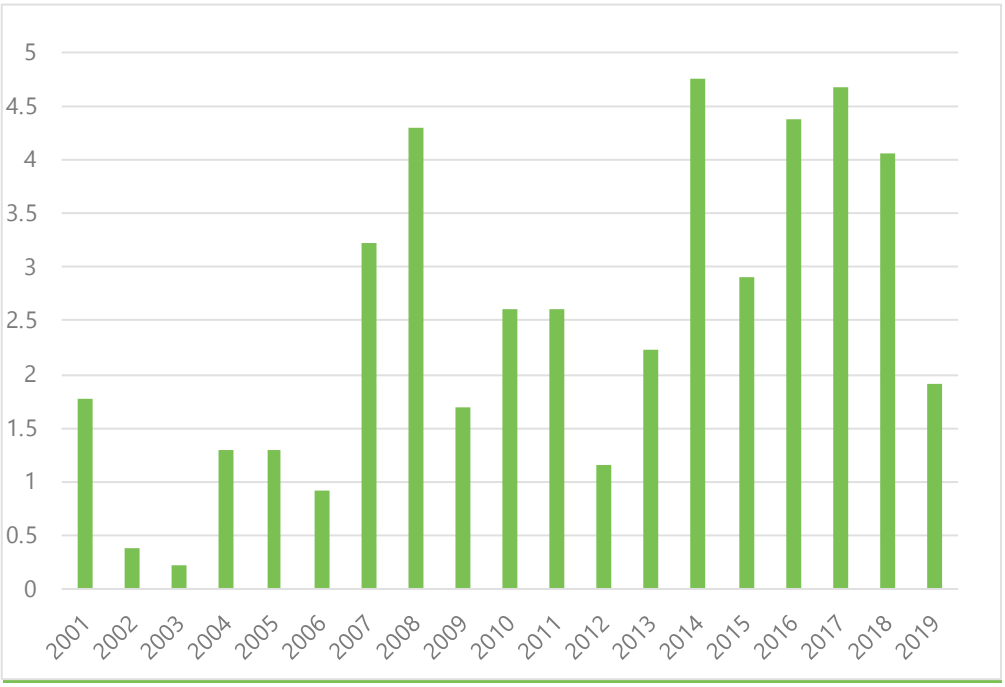
Makassar current and future pressures in relation to the environment are:

- Continues degradation of the environment due to unsustainable development, and as a result of economic expansion, population growth and climate change.
- Land use change, Makassar building up area trends to increase while open space and natural ecosystems trends to diminish. Between 1990 and 2000, as much as 24% of the total agriculture land and 16% of the paddy cultivation area was converted to other uses, namely, housing and commercial (Djalante et al., 2017). Rapid urbanization, which is not matched by controlling the use of space and increasing the welfare of society economically, has a positive contribution to the decline in environmental quality (e.g. air pollution) (Al Jarah, et al., 2019).

Because of its location, Makassar is vulnerable to the impacts of climate change, such as typhoons or floods, which has pushed authorities to promote climate change adaptation strategies. Approximately 57% of the city's gross domestic product (GDP) is derived from the manufacturing, construction and trade (Statistic Bureau, 2020). These industries are located mostly along the coast and are at risk of flooding because of sea level rise.

In 2000, 6,3% of Makassar was tree cover. From 2001 to 2012, Makassar gained 4 ha of tree cover region wide. From 2001 to 2019, Makassar lost 46 ha of tree cover (Figure 39), equivalent to a 4.1% decrease in tree cover since 2000, and 10.4kt of CO_2 emissions. From 2016, none of Makassar's tree cover was intact forest.

Figure 38: Tree cover lost in Makassar (ha) [66]



Makassar has three key ecosystems providing environmental services which play an essential role in minimizing sensitivity to climate change impacts for poor and vulnerable communities (see Table 18).

[66] Adapted from Global Forest Watch, 2020

Table 18: Makassar ecosystem's services [67]

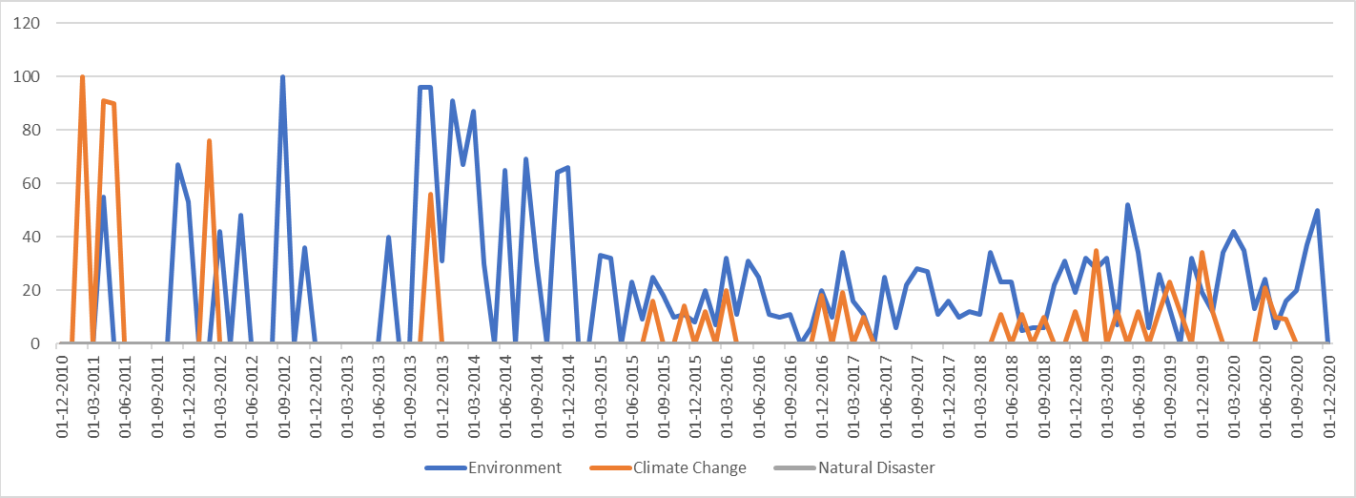
ECOSYSTEM	ECOSYSTEM SERVICES
Jeneberang watershed	Raw water provision Timber production Food production Flood control
Tallo River and wetlands	Pollutant sinks Estuary biodiversity (fisheries) Water purification systems Raw water provisions
Island and coastal zone	Mangrove forests offer protection from high waves from storm surges, minimize coast abrasion, reduces strong winds, provides environment for biodiversity. Coral reefs promote fish stock for shallow catch

6.2.3 Future trends

Environmental degradation contributes to climate change. Mitigation measures for climate change adaptation will improve the environment and vice versa. Any action to improve the environment will help to reduce the effects of climate change.

Figure 40 shows the search interest for environment, climate change and natural disaster relative to the highest point on the chart for South Sulawesi from 2010 to 2020. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough data for this term.

Figure 39: Interest over time South Sulawesi [68]



The awareness of the population regarding climate change and environment has decreased over time, while not enough data exists for natural disasters. However, when looking at the awareness by natural disaster, peaks are evident after major disaster, such as after the tsunami on

[67] UN-Habitat, 2014
[68] Google Trends, 2020

September 2018. Figure 40 indicates that there is a need to raise the awareness over those topics.

6.2.4 Rapid needs assessment

In order to preserve important ecological areas, an important consideration for the future planning of Makassar is setting a limit to development and balancing the built-up areas with open space and mangrove forests. Special focus should be on the overall development and specifically within the coast. When development occurs sustainable development principles should be mainstreamed e.g. limited reclamation activities, integrated coastal management, ensuring the continuity of river normalization of the three main rivers.

The ecosystem in the Makassar Strait is complex and abundant; nearby islands and coastal areas with mangrove forest, mudflats and coral reefs provide optimal conditions for marine biodiversity and coastal livelihoods. Makassar lies on a relatively flat topography with hills to the east of the city which create natural water catchment areas with semi-dense vegetation.

Makassar is growing rapidly and development there is profoundly affecting the city in both positive and negative ways. New commercial and residential developments along the coastal wetlands, combined with plans to increase the city's size by 20 percent — by taking land from the periphery and dumping it in the sea to create landfill — promise a boost to the city's economy. But this simultaneously threatens Makassar's many traditional fishing communities by blocking their access to the ocean or evicting them entirely and causes ecological harm that results in fewer fish stocks farther from shore.

Many countries use ecosystem-based adaptation to deal with a broad range of climatic hazards and impacts. Some examples include:

- Mangrove reforestation and conservation to protect against storms and help control erosion.
- Mixed farming techniques to maintain soil fertility and conserve water.
- Slow-forming terrace farming systems to increase soil moisture and reduce run off.

Positive results from these and many other interventions are being documented using several effectiveness measures including biophysical monitoring, cost–benefit analysis, community perception, and multicriteria scoring.

Major intervention to improve the environment should focus on:

1. Strategic spatial planning in landscape ecological network (e.g. integrated coastal management, ecosystem connectivity). Mainstream the Environmental Performance Index to local policies for Makassar:
    - Monitoring of conservation and protection of watershed area in Tallo and Jeneberang
    - Land use controlling in watershed area
    - Monitoring of environmental quality in coastal areas and small islands
    - Mangrove plantation in coastal areas
2. Clean energy / renewable energy, decentralized energy resources or distributed energy resources (e.g. photovoltaic, tidal current, wind energy):
    - Energy efficiency policies (energy levels)
    - Improve public transport
3. Improve/enhance environment and climate change education and awareness.

6.3 DISASTER RISK MANAGEMENT

6.3.1 Policy framework

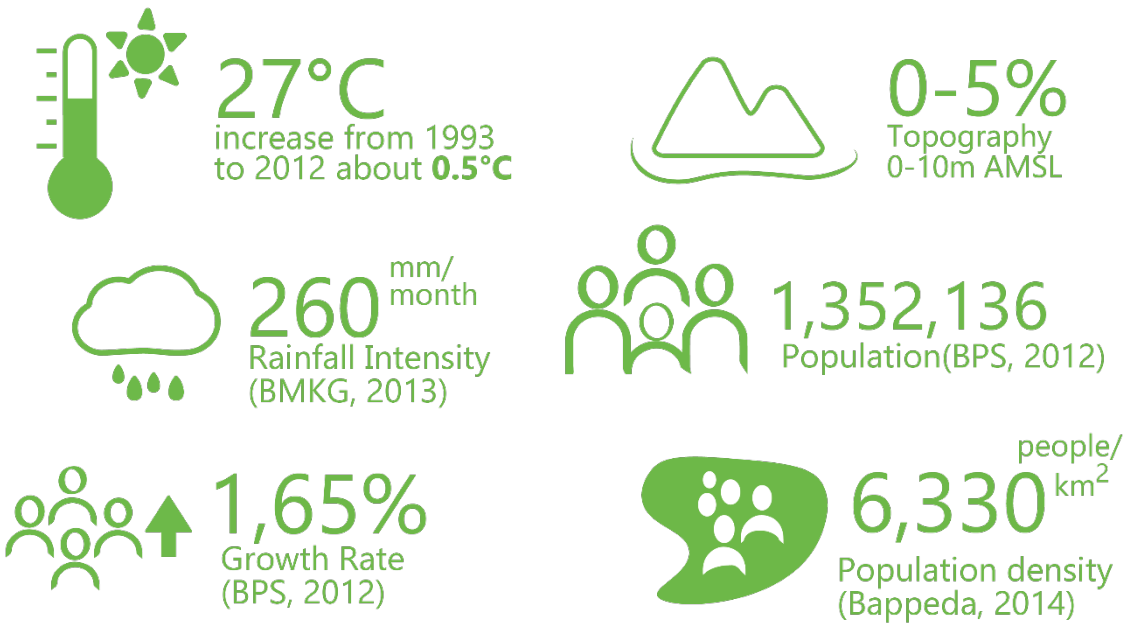
There is no institution at the city level of Makassar that addresses climate change while for natural hazards there is "Badan Pengendalian Bencana Daerah" (Regional Disaster Management Agency).

6.3.2 Needs and development plans

Indonesia is one of the most disaster-prone countries on the planet, given its high exposure to natural hazards coupled with its high socio-economic vulnerability. Indonesia had 429 recorded disasters since 1900 caused by natural hazards, being the most frequent floods and earthquakes. These disasters have affected more than 29 million people and have killed more than 238,000 people. The cost of the damages is estimating in more than 44 million USD (UNISDR 2016).

South Sulawesi and the capital Makassar are exposed to climate change and natural disasters. The Makassar Strait region has had the highest frequency of historical tsunami events for Indonesia (Prasetya et al., 2001). The objective of this document is to provide a brief description on existing situation in Makassar (Figure 41) on climate change and natural hazards. An assessment of the situation has been carried out based on literature review and interviews, which contains key challenges, potential interventions, as well as recommendations for executions of development scenarios.

Figure 40: Makassar Risk Profile [69]



[69] Gunawan et al., 2015

6.4 CLIMATE CHANGE AND NATURAL HAZARDS

6.4.1 Policy framework

The government of Indonesia has developed the following plans and policies to address climate change and natural hazards:

National Action Plan Climate Change Adaptation (RAN API/Rencana Aksi Nasional Adaptasi Perubahan Iklim).

- RAN-API is Indonesia's national action plan on climate change adaptation. It identifies two key areas of climate change and their impacts on livelihoods. These two areas are increases in sea level and changes in weather, climate, and rainfall. Increasing sea level rise impacts fisheries, marine economies, and agriculture. Changes in weather, climate, and rainfall impacts health (vector borne disease and respiratory illness from fire), water availability, and contributes to natural disaster. Bappenas – the ministry of national development planning – implements RAN-API. RAN API has been described in the Spatial Plan and Medium Term Development Plan.

National Action Plan on reducing Emission (RAN GRK/Rencana Aksi Nasional penurunan emisi Gas Rumah Kaca).

- The RAN-GRK proposes mitigation actions in five priority sectors (Agriculture, Forestry and Peatland, Energy and Transport, Industry, Waste Management) as well as other supporting actions that are an integral part to the national development planning which supports the principles of economic growth, poverty alleviation and sustainable development. (RAN-GRK) is a follow up to Indonesia commitment to reduce GHG emission by 26% in 2020 from the BAU level with its own efforts and reaching 41% reduction with international support.
- RAN-GRK was developed to provide a policy framework for the central government, local governments, private sectors, and other key stakeholders in implementing actions related directly and indirectly to GHG emission reduction efforts during the period of 2010-2020 according to the Long-Term Development Plan (RPJP 2005-2025) and the Mid-Term Development Plan (RPJM). According to the regulation, each province must develop the RAD-GRK program. South Sulawesi program was prepared in 2010. Regional reporting is done online to BAPPENAS. Unfortunately, the existing regulation only obliges Provinces to reduce greenhouse gas emissions, while the data required is in districts / cities. The provinces have experienced difficulties in reporting. Currently RAN GRK has been upgraded to Low Carbon Development Planning (PPRK).

At the local level, one of the tasks of the National Board on Disaster Management (Badan Nasional Penanggulangan Bencana, (BNPB)) is to develop a guideline to establish a local disaster management office/BPBD (Badan Penanggulangan Bencana Daerah).

There is no specific regulation on climate change and natural hazard at Makassar city level. The existing regulations follow those stipulated by the central government and the provincial government. City agencies carry out the regulations.

The City Spatial Plan (RTRW) has outlined strategies to strengthen mitigation and adaptation in the coastal areas. These strategies include the following.

1. Revitalization
Well-planned, controlled, and limited reclamation activities, by complying with the regulations related to mitigation and adaptation (i.e. sedimentation and abrasion).

2. Stipulating elevation standards for coastal development

3. Development of drainage systems

4. Adopting the waterfront concept when developing coastal and riverbank areas
Integrating built-up areas with green open spaces and productive mangrove forests.

6.4.2 Institutional arrangements

There are several Makassar city offices that are responsible for various factors or impacts of climate change. The agencies consist of the Department of Marine Affairs, Fisheries, Agriculture, and Animal Husbandry; Department of Spatial and Building Planning; Regional Planning and Development Agency; Regional Disaster Management Agency; Public Works Department; and Environment Agency.

There is no agency that specifically manages climate change at the city level. Climate change management is carried out by the environment and forestry department, and there is a regional office for the Climate Change Center (PPI) located in Makassar city.

The Center for Meteorology, Climatology, and Geophysics has the task of conducting observation, data management, forecasting, research, cooperation, calibration, and meteorological, climatology, air quality, and geophysics services.

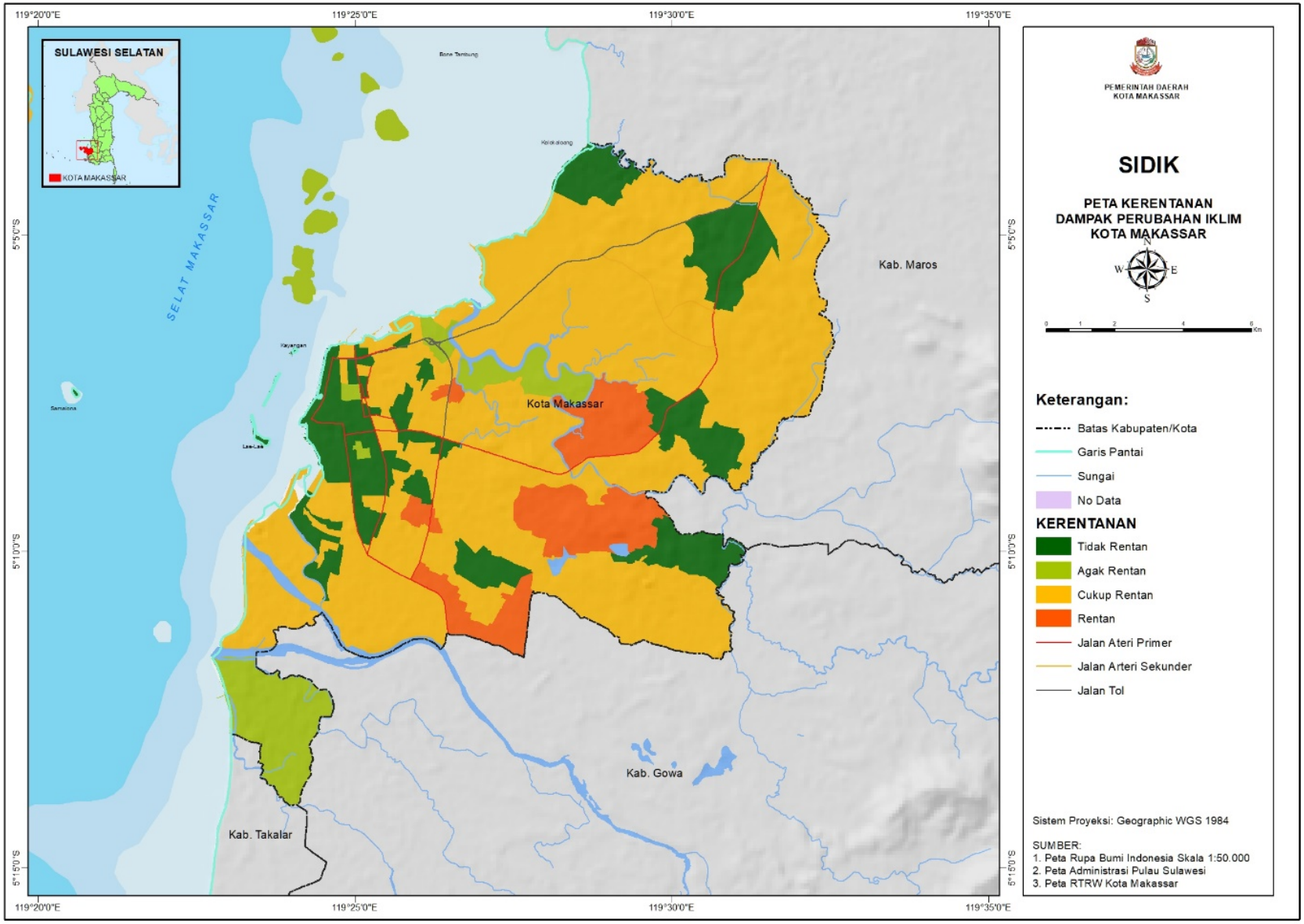
6.4.3 Risks based on current climate variability

To evaluate of vulnerability of villages relative to other villages in responding to disasters (coping range) based on the position of vulnerability index value and capacity of each village. The methodology to support this analysis is provided in *Volume 13: Climate Change and Natural Hazards*. For Makassar city the vulnerability level map can be seen in Figure 42.

Classification of vulnerability

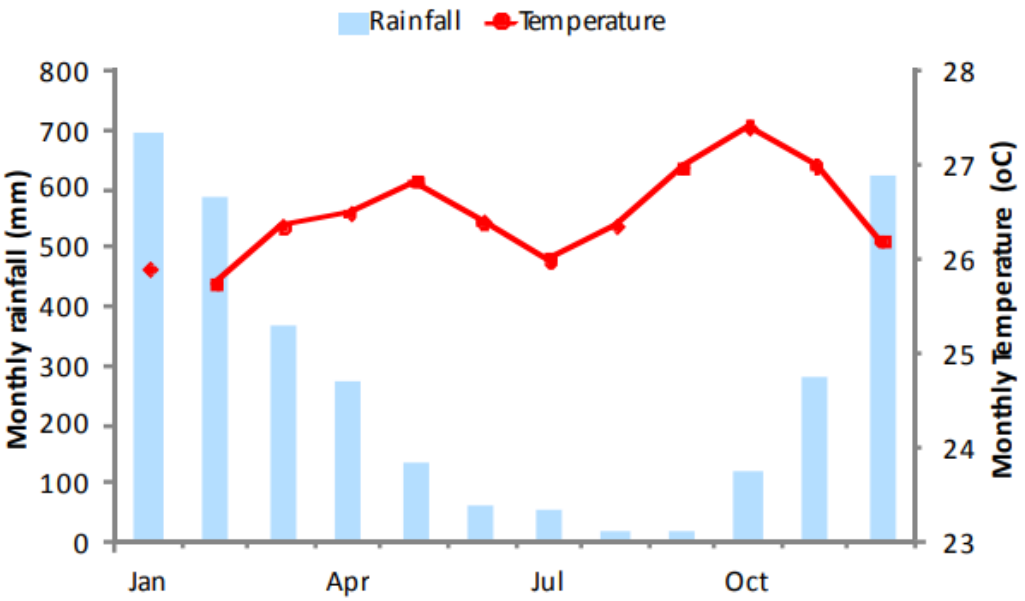
- Tidak rentan – Not vulnerable
- Agak rentan – Somewhat vulnerable
- Cukup rentan – Quite vulnerable
- Rentan – Vulner able
- Sangat rentan – Very vulnerable.

Figure 41: Vulnerability Map of Climate Change Impacts of Makassar City



Makassar has a tropical climate with a distinct wet and dry season (Figure 42). Aligned with the global pattern of warming, there has been steady increase of warming in Makassar since the 1980s. Rainfall was periodic but subsequently more variable in recent years. The majority of models and research suggested concentration of the intensity of rainfall during rainy season. These increase of intensity in rainfall is projected to cause more flooding in the future. Watershed areas are prone to flooding, especially urban areas surrounding Jeneberang River, Tallo River and Maros River. Communities with poor drainage system or ones who are not connected to the water resource are particularly vulnerable.

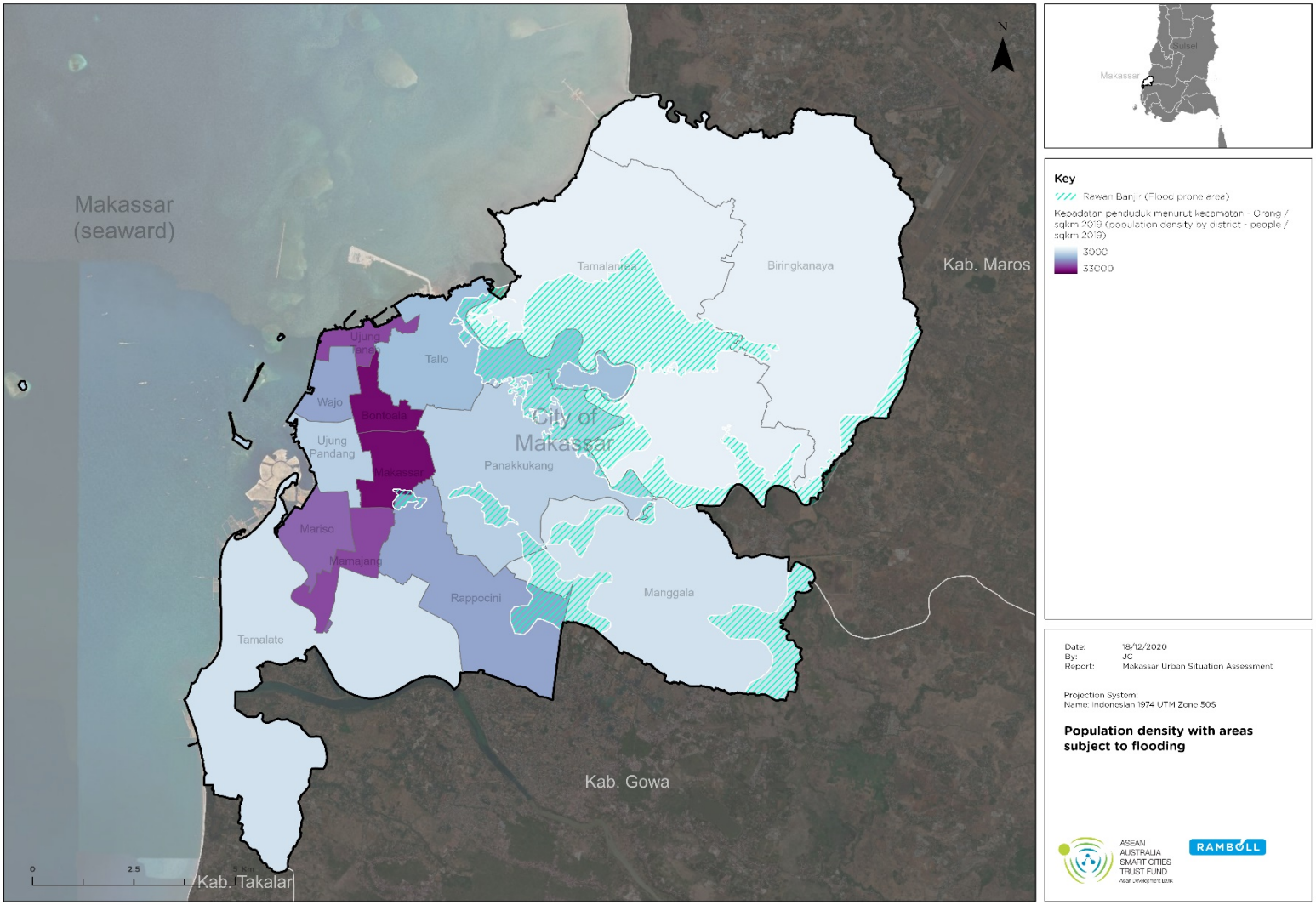
Figure 42: Long-term mean of rainfall and temperature at Makassar [70]



igure 43 maps areas prone to flooding alongside population density. In general, areas of high population density are not located in flood prone areas, with the exception of parts of the Tallo, Rappocini and Makassar Kecamatan.

[70] CSIRO, 2014

Figure 43: Population density with areas subject to flooding

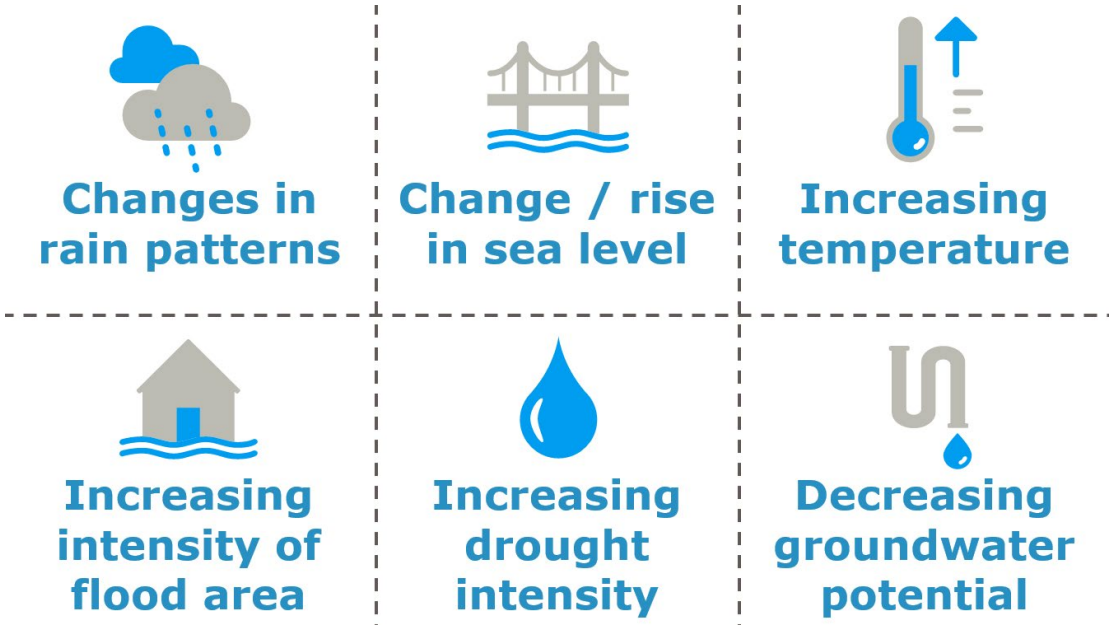


Over the period of 1993 – 2002, sea level rise in Makassar has risen to 7.5 cm and based on simulations it is estimated that by 2025, it will reach 88.16, 1.14 m by 2050 and 1.44 m by 2100 (BPPT, 2008). Reportedly, during 2000 – 2002, sea level rise has damaged 4000 houses resulting in US$11 million (The National Intelligence Council, 2009). Urbanization on the coastal areas have further caused decrease of mangrove ecosystem area, degrading the nature ability to help protect the area from sea level rise. Low-lying areas along the coastline with tourism, hospitality and coastal communities on the Kecamatan of Tallo, Biringkanaya, Mariso, Tamalanrea and Wajo are especially in high risk.

Figure 44: Rising Temperature in Makassar [71]

Makassar key challenges related to climate change and natural hazards are shown in Figure 46.

Figure 45: Key challenges related to climate change



[71] Maritime Meteorology Paotore Station, 2013

Makassar key climate change and natural hazard challenges are described as follows:

1. **Changes in rain patterns:** The influence of the monsoon climate with the dry season and the rainy season domains the city of Makassar. Based on research by CSIRO and Hasanuddin University, the total amount of rainfall is the same, but the rainy season is shorter by several days, while the dry season is longer. This explains the vulnerability of flooding and drought which tends to increase in the future.
2. **Change / rise in sea level:** The sea level in Makassar rose up to 7.5 cm within the period of 1993 – 2002. It is estimated that the sea level increase in Makassar could reach 1.14 m by 2050.
3. **Increasing temperature:** Makassar City has a hot climate. The mean monthly temperature varies from about 27^0 C to more than 29ºC. However, the daily temperature can be higher than the average monthly temperature and can reach 33ºC on certain days. Based on simulations the temperature tends to increase. The increase is because global warming, reduced open green space and increased build-up area.
4. **Increasing the intensity of the flood area:** Flooding or inundation is currently cause by increased rainfall intensity and physical characteristics e.g. destruction of the upstream watershed.
5. **Increased drought intensity:** During the dry season, some residents of the city of Makassar report a lack of water to meet domestic needs. Drought is not only caused by reduced rainfall, but also due to the dysfunction of the ecosystem as a water regulator. Water supply source in Makassar comes mainly from Jeneberang River. During the dry season the discharge decreased while the turbidity increased, so the municipal water company could not process and distribute clean water to meet the needs of the community.
6. **Decreasing groundwater potential:** Changes in land use due to population growth are impacting surface water supply and groundwater reserves. Current water supply in Makassar is not able to cover the water demand. Groundwater is also reduced because there is not enough recharge. In the rainy season, there is an increase in runoff due to the wider built-up area, while in the dry season the river water discharge decreases and cannot fill the groundwater. Excessive groundwater extraction in several places on the coast has experienced sea water intrusion. Therefore, abstraction of ground water has increased scientifically. These abstraction impacts the groundwater level and increases the salinity of the groundwater. Rapid depletion could also impact soil stability among other effects into the future.

Other natural hazard risks present in Makassar include:

- Earthquake: Makassar is in earthquake zone 2, which is a minor risk earthquake zone. (Source: Procedure of Earthquake Resistance Planning for Building, Indonesia National Standard/SNI 03-1726- 2003).
- Tsunami: Due to its coastal location and higher risk of earthquakes in other areas of the region, particularly the tsunami risks associated with the Makassar Strait[72], Makassar is prone to Tsunamis.
- Coral Reef Ecosystems: Indonesia was reported to have experienced a rapid decline of marine resources over the last three decades, with urgent conservation measures needed (Allen, 2008). Coral reefs are threatened by destructive fishing practices (e.g. fishing with explosives), offtake for trade and local uses, pollution, coastal destruction and tourism (UNEP-WCMC, 2015).

[72] Makassar Strait has had the highest frequency of historical tsunami events (Source: *The Makassar Strait Tsunamigenic Region, Indonesia*, G. S. PRASETYA, W. P. DE LANGE and T. R. HEALY, Coastal Marine Group, Department of Earth Science, University of Waikato, Private Bag 3105, Hamilton, New Zealand (Accepted: 31 January 2001)for Indonesia

- Seagrass and Seaweed Ecosystems: Seagrass and seaweed ecosystems has declined in Indonesia due to anthropogenic disturbances (growing population and economic development). The declines of these ecosystems effect the biodiversity, fisheries productivity, coral reef and mangrove forest. Seagrass ecosystems are marginalised in the coastal resource management practices in Indonesia (Nadiarti et.al., 2012).

6.4.4 Needs and development plans

Climate change impacts can be mitigated or reduced by implementing climate adaptation efforts. Reducing the vulnerability of urban villages can be achieved by interventions focus on the exposure and sensitivity and coping/adaptation factors. These mitigations should be part of the spatial planning and flood control by the public works agencies. In addition, social agencies also play a role in reducing poverty levels and population dynamics. Mitigation efforts under the environmental agency should focus on increasing the green open spaces and increasing the vegetation index. Mitigation efforts should also focus on increasing the capacity of other sectors, e.g. the electricity company, social agency, education agency, health agency and public work agency.

It is initially recommended to improve the quality of spatial planning, conduct the latest studies to determine the impact of climate change in more detail, including models of sea level rise, better manage water resources through cooperation with surrounding districts, particularly in watershed rehabilitation. Additionally, further analysis may be required into the effect of potential natural disasters for future planning of Makassar (e.g. risk assessments, response and resilience, coastal development planning, early warning systems and construction techniques).

7. SOCIAL CAPITAL: GOVERNANCE AND COMMUNITY

7.1 GOVERNANCE

7.1.1 Roles and relationships of institutions

Although the planning, policy and legislation is very much top-down, the local government has a pivotal role in terms of implementation. The head of each local government office reports to the ministerial counterpart at the national level and to the Mayor keeping Bappeda (*Badan Perencanaan dan Pembangunan Daerah*/Local Planning and Development Agency) and Sekda (*Sekretaris Daerah*/Local Secretary) engaged with decision making and policy direction.

Most offices are financed by the Local Budget (APBD), but specific national programmes that are implemented in the provinces/cities/municipalities are supported with National Budget (APBN). The local offices could also receive assistance task from the central government (funded with national budget/APBN), but this also in relation to programmes that are nationally implemented. National Budget/APBN cannot be used to fund personnel, only for program implementation.

In Indonesia, urban development is guided by the 5-year National Mid Term Development Plan (RPJMN) and the 20 years National Long Term Development Plan (RPJPN). Both of these documents are developed by BAPPENAS then translated into the Local Mid Term Development Plan (RPJMD) and the Local Long Term Development Plan (RPJPD) at the provincial and local level. Usually, the Bappeda, working together with related local offices, helps the elected Governor or Mayor/Bupati in preparing these documents, including developing the Local Spatial Planning (RTRW/*Rencana Tata Ruang Wilayah* and RDTR/*Rencana Detail Tata Ruang*). These documents are the guidelines for urban development at the local level.

7.1.2 Needs and development plan

Smart governance analysis

A good and smart governance is one that can fulfill basic services in an efficient and effective manners, among others:

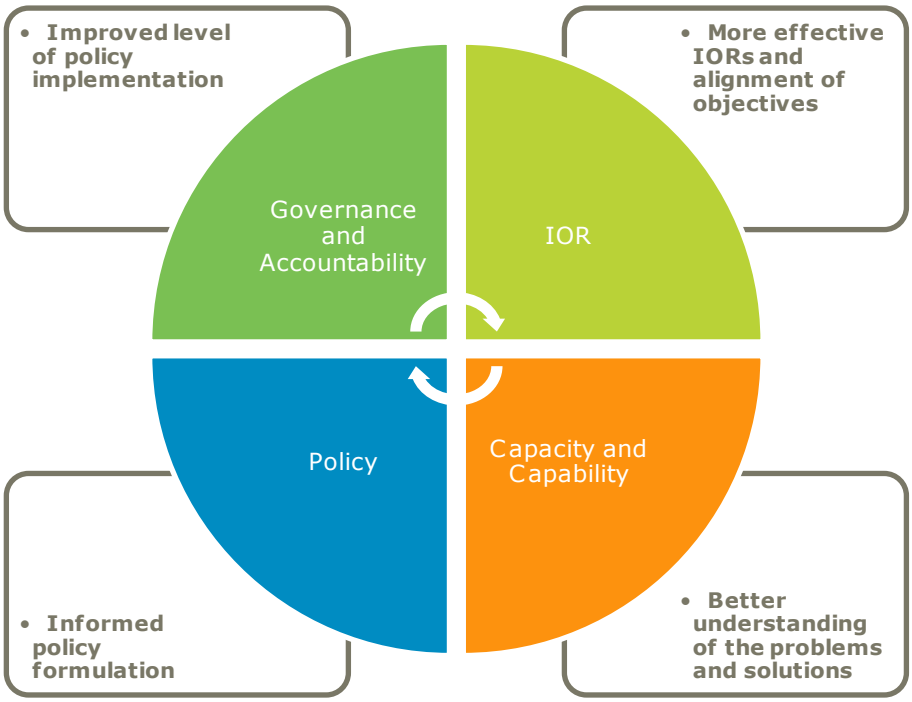
1. Providing ease of doing business
2. Providing an easy to use application that aims to improve services
3. Providing a public complaint mechanism.

There are many benefits of adopting the smart governance, which can be seen in Figure 47.

"For a smart city's visions to be realised, it should include the sustainable elements of an eco-city, and it needs to be designed with the clear objective of elevating public services, improving government efficiency, and minimising negative environmental impacts through the creation of waste and pollution"

Source: Tan and Taeihagh, 2020

Figure 46: Benefits of Smart Governance



Note: IOR – Inter Organizational Relationships

Smart Governance Principles are used to assess the governance of Makassar:

- Effectiveness
  - Law enforcement index/ supporting policies/laws/regulation
  - Equality of services and accessibility
  - Transparency and accountability
- Efficiency
  - Bureaucracy efficiency/innovation in government function
  - Integrated services/collaboration/interoperability/wider participation
  - Economic sustainability
- Infrastructure development and security
  - Open data platform
  - Government web/apps
  - Data protection.

Makassar has shown efforts in applying these principles, as can be seen in Table 2. Relevant policies are in place, although still lacking the enforcement, required infrastructures are established but not quite fully functioning. It can be concluded that Makassar is already on the right path but still need a some more effort to achieve the status of smart governance.

Table 19: Makassar Governance Assessment

SECTOR / SMART GOV PRINCIPLES	URBAN DEVELOPMENT	WATER, SANITATION, SOLID WASTE AND ELECTRICITY	GESI	ENVIRONMENTAL AND LAND MANAGEMENT	FINANCIAL STABILITY AND ECONOMIC DEVELOPMENT	TOURISM	URBAN MOBILITY	SMART INFRA STRUCTURE (ICT)	CLIMATE CHANGE AND NATURAL HAZARDS
Effectiveness									
Law enforcement index/ supporting policies/laws/regulation/licensing	√	√	√	√	√	√	√	√	√
Equality of services and accessibility	●	✕	✕	●	●	●	●	●	●
Affordability & sustainability	●	✕	✕	●	●	●	●	●	×
Efficiency									
Bureaucracy efficiency/innovation in government function	●	●	●	●	●	●	●	●	●
Integrated services/collaboration/interoperability/wider participation	●	✕	✕	✕	✕	✕	✕	●	✕
Transparency and accountability	√	●	✕	●	●	●	✕	●	●
ICT Infrastructure development and security									
Open data platform/ Government web	√	●	●	●	●	●	●	●	√
Government apps	●	●	✕	●	●	✕	✕	●	●
Data protection	✕	✕	✕	✕	✕	✕	✕	✕	✕

√ = yes (functioning) ✕ = no ● = not fully functioning

Potential interventions

In general, a number of areas are evident where governance is weak and further institutional development is required. It is often the case that once the political process has formulated policy (ideally with grass roots input) then the operators and regulators should be left to implement the policy without political interference. In this way they become more responsive and build capacity.

Smart solutions will be investigated to improve governance such that each sector is economically sustainable, achieves equality of service, is transparent and accountable and with wider participation, identifies the optimal policies.

Rapid urbanisation is a challenge in that the planned urban development is unable to keep pace with demand. As a result, informal settlement takes place, resulting is difficulties in building up the required infrastructure and a planned and sequential manner. This is in part due to weak governance and the lack of regulation of the spatial plans. This type of systemic problem needs to be modelled so that it doesn't become worse. At the same time, a socially acceptable method of upgrading slum areas needs to be agreed.

Table 20: Key Challenges and Potential Interventions – Development and economic

DISCIPLINE	KEY CHALLENGES	POTENTIAL INTERVENTIONS
Urban Development	Escalating informal settlements Ineffective Musrenbang (community consultation) process?	Firstly, solutions need to be agreed at all levels so that existing slum areas do not expand. Then systemic issues need to model in consultation with national, provincial and local authorities and policies, laws and regulations put in place with a practical system of governance. In order to strengthen governance a set of smart incentives and sanctions will be required in order to encourage compliance with the urban development plan.
Financial Stability and Economic Development	Need to increase the revenue of the city	The correct registration of households and economic activity through SMART ICT would help reduce that deficit. Economic regulation controlling a balanced mix of public, PPP and private enterprise. Good governance is required to protect basic social services yet promote innovation
Tourism	Need to improve information services for tourists as well as public facilities of tourist attractions	Apps for tourists (e.g. interactive maps)' Sustainable tourism relies on good environmental standards.

Table 21: Key Challenges and Potential Interventions – Infrastructure

DISCIPLINE	KEY CHALLENGES	POTENTIAL INTERVENTIONS
Water, Sanitation, Solid Waste and Electricity	Water • Scarce water resources • Saltwater intrusion into aquifer and rivers • Physical and commercial losses • Masterplan	Water • Regulation and governance of use of well water in order to stop reduction in level of aquifers and prevent saline intrusion • Control of wells through licencing • Improve economic regulation • Stronger governance to reduce non-revenue water
	Sanitation • Weak governance • Under investment • Environmental impact	Sanitation • Regulations for 'Construction Corridors' so that networked services can all be constructed at the same time in order to reduce disruption and costs • Improve governance of septic tanks • Improve economic regulation • Strengthen governance of the sector so that discharge consents are issued and enforced • Improve registration of industrial discharges • Water, sanitation, and electricity are all networked based infrastructures, but the most disruptive to implement is wastewater network • Ideally, no-dig solutions can be used in many cases
	Solid Waste • Scarcity of land • waste disposal sites lack capacity • No one can process solid waste (unable to participate in national programme: W2E plant)	Solid Waste • Regulation of vehicle movements in order to minimise traffic at peak hours
	Electricity • National operator	Electricity • Investigate level of commercial losses – investigate institutional methods to increase accessibility and affordability in informal areas. Possibly introduce Smart metering to minimise commercial losses • Investigate laws, regulations for renewable energy and PSP
Urban Mobility	Traffic congestion Improve public transport, optimize BRT and TOD	• Spatial planning could theoretically reduce the need for urban mobility and reduce congestion • Good governance coupled with good spatial planning could solved some of the challenges • SMART solutions for congestions charges, toll roads, and flexible speed limits (see annex 6)
Smart Infrastructure (ICT)	ICT No data protection	• Open data platform • Government web/apps • Data protection • SMART solutions that also protect data and the individual. Security (see annex 6)

Table 22: Key Challenges and Potential Interventions – Social and environment

DISCIPLINE	KEY CHALLENGES	POTENTIAL INTERVENTIONS
GESI	• Combatting violence against women and children. • Reduce number of violence and sexual molestation and assault on children. • Increase number of women in governance. • Increase the understanding of Makassar city offices (SKPD) on gender responsive planning and budgeting. • Improve coordination on handling and preventing trafficking. • Increase the minimum service standard (MSS) on violence and trafficking. • Improve guidance on women organization. • Improve data availability on gender statistic	The legislation is in place. Monitoring and education is required in order to promote more inclusive norms.
	Health	Institutional Development required to improve accessibility and affordability. For SMART solutions see Annex 6.
Environmental and Land Management	Registration of all sources of pollution	SMART solution might help. The regulation of industrial discharge is crucial. Smart solutions are required for detecting illegal discharges and improve governance.
	Land Management	Improve governance of land management and spatial planning.
Climate Change and Natural Hazards	Lack of coordination with other sectors. Lack of governance allowing informal settlement	SMART monitoring and warning systems. Integration of resilient urban design with all other sectors through mapping and data sharing.

Summary
In all cases, legislation has been developed over a number of years in order to execute policy but there is evidence of weak governance allowed in some cases a degree of *ad hoc* development, preventing the provision of equitable and accessible services to the entire population.

To solve this, better horizontal inter-organisational relationships between sectors are required to improve coordination and cooperation. Regulatory entities also need further development and strengthening to modify behaviour and bring about positive institutional change. The use of ICT and smart solutions to monitor and control activity through licencing and inspection is one way to strengthen regulation (refer to Appendix 3).

At the same time, policies that tackle the root causes of the multi-faceted challenges faced by Makassar are needed. And these policies need strong governance to bring about the positive change required in the development of Makassar.

7.2 TARGETED ECONOMIC DEVELOPMENT STRATEGY

7.2.1 Makassar economic profile

Overview
Indonesia is one of the world's largest emerging market economies. With the help of sound economic policies Indonesia has developed a strong and stable economic growth, sharply reduced poverty, raised living standard for millions of its citizens and enabling the emergence of a vibrant middle class. [73] [74] In Indonesia, 70% of the workforce was estimated be engaged in informal employment, mostly in the agriculture sector. [75]

Makassar is one of the key city economies in Indonesia. Makassar City is the largest city in South Sulawesi, accounting for 20% of the population and over 50% of estimated GDP. The economy is built on trade, construction and manufacture, and is growing rapidly.

Makassar is relatively autonomous from central government, but the public sector still plays a pivotal role in the economy's functioning. Approximately 42% of the population is working but one quarter of the City population are classed as living in poverty or extreme poverty.

Using the UN indicators, 12.6% or 190,000 people in Makassar live in extreme poverty (on less than USD1/day) and 25% or 380,000 live in poverty (on less than USD2/day). These findings are far higher than Indonesia's national averages. [76]

The inflation rate for Makassar calendar year January 2020 is 0.66 percent and the year-on-year inflation rate (January 2020 against January 2019) is 2.25 percent.

Makassar's economy had grown at 6.20 percent in early 2020 and slumped to 2.8 percent in the second quarter of 2020.

[73] Breuer, Luis E., Jaime Guajardo, and Tidiane Kinda, eds. 2018. *Realizing Indonesia's Economic Potential.* Washington, DC: International Monetary Fund.
[74] https://www.researchgate.net/publication/325284245_Urbanization_and_Labor_Productivity_in_Indonesia
[75] https://www.adb.org/sites/default/files/publication/28438/informal-sector-indonesia.pdf
[76] World Bank, 2018. Poverty and equity brief: Indonesia. World Bank, 2pp. https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_IDN.pdf

Owing to the COVID-19 pandemic a contraction in the economy of Makassar City is expected for 2020 and 2021 also saw the following changes in public investments:

1. easing economic activities by implementing strict health protocols
2. ensuring the supply and distribution of goods to maintain price stability
3. the assistance scheme to maintain production continuity
4. the allocation of regional expenditure budgets effectively in the economic activity stimulus program.

Six sectors in the city of Makassar have been prioritised for support:

1. Trade
2. Transportation
3. processing industry
4. construction
5. accommodation, food and drink provision services
6. company services.

Industries

The foundation of the Makassar economy lies in the tertiary and secondary sectors. Table 23 summarises the top 5 sectors which account for 71% of the Makassar economy over 2015-2019. It is dominated by manufacturing, trade and construction with information and communication and finance.

Table 23: Top 5 industrial sectors, by contribution to GDP, 2015-2019

	SECTOR	2015	2016	2017	2018*	2019**	AVERAGE
1	Manufacturing	20.24%	20.62%	19.95%	18.34%	18.31%	19.49%
2	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	18.29%	18.66%	19.11%	19.82%	20.46%	19.27%
3	Construction	17.13%	17.12%	17.26%	17.95%	18.22%	17.54%
4	Information and Communication	8.92%	8.94%	9.02%	9.24%	9.08%	9.04%
5	Financial and insurance Activities	5.98%	6.21%	6.19%	6.06%	5.81%	6.05%

See Figure 48 for a high-level summary of the important economic areas in Makassar, based on land use zoning.

Figure 49 maps existing and future economic land uses across Makassar by land use type, showing where people work across the city.

Figure 47: Important economic areas and roads in Makassar

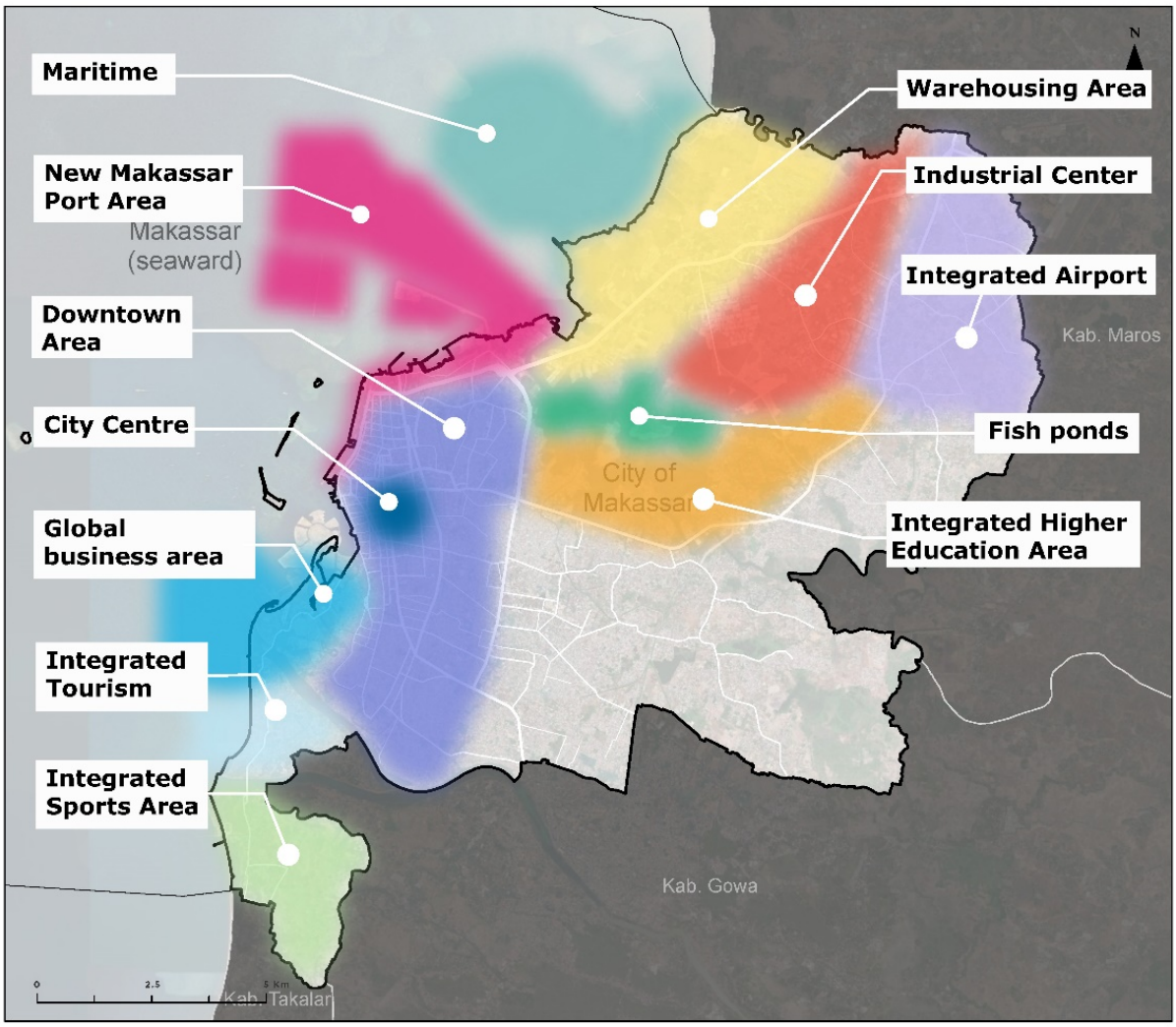
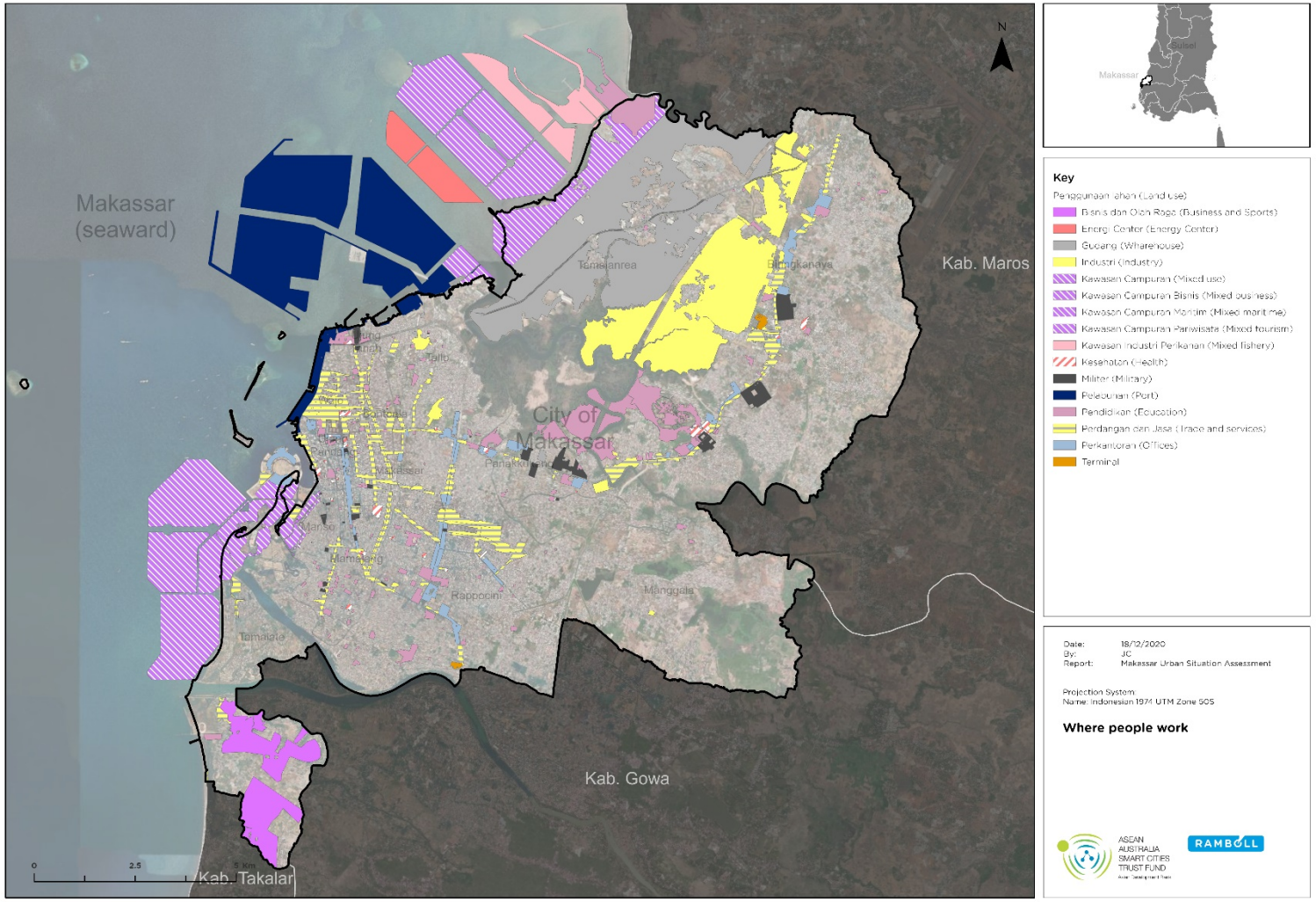


Figure 48: Economic land uses



Economic vision [77]

Beyond COVID19, it is predicted that the economy of Makassar City will begin to enter a recovery phase by maximizing improvements in strategic sectors. The strategies implemented included preparing a special economic stimulus for superior SMEs, assistance schemes to maintain production continuity, preparing affected social safety networks and refocusing and budget reallocation. [78]

The following key urban developments are expected to stimulate the local economy in the coming years:

- Development of the new Makassar Port
- Cargo train Makassar to Parepare
- New Train Station
- International Integrated Business Center (Global Business Area expansion onto reclaimed area)
- New recreation & sport centre
- Growing residential area for middle-high income range
- Maritime centre, include fishery harbour, warehouse, manufacturing, cold storages, education centre for maritime and fishery industry (north east of Makassar)
- Development of an integrated tourism precinct.

7.2.2 Tourism in Makassar

Size of the tourist economy in Makassar

In October 2020, there were no foreign tourists visiting South Sulawesi, due to travel restrictions imposed in response to the spread of COVID-19 around the world. The Room Occupancy Rate (TPK) of star-classified hotels in South Sulawesi in October 2020 fell by 4.11 points compared to the September 2020, from 38.38% in September 2020 to 34.27% in October 2020. When compared to October 2019 (53.35%), the ROR for hotels with star classification in October 2020 decreased by 19% [79].

Aside from the dramatic reduction in tourism in response to the COVID-19 pandemic, the tourist economy of Makassar is limited. As the largest city in eastern Indonesia, a transit city for international flights and shipping in Indonesia and supported by the potential for various tourist objects and events, there is potential for a large number of tourists - both foreign tourists, national tourists and local tourists. However, in reality there are very few foreign visitors who visit Makassar. The number of foreign visitors visiting Makassar, using the entry point of Sultan Hasanuddin International Airport was 17,771 people in 2019 compared to 16,106,954 people foreign visitors who visited Indonesia in the same year.

A tourism survey has been carried out to explore the opinions and expectations of tourists regarding the conditions of tourist destinations and objects in Makassar city. The results showed marine tourism, culinary tourism and religious tourism are of high importance to visitors to Makassar. Heritage tourism and arts and culture tourism were the lowest performing categories.

[77] https://asean.org/storage/2019/02/ASCN-Consolidated-SCAPs.pdf; http://workworkworkwork.work/kotakita/publications-docs/Makassar%20Climate%20Change%20Vulnerability%20Assessment_Nov%202013.pdf

[78] http://bpkad.makassar.go.id/bpkadmakassar/2020/10/15/pemulihan-ekonomi-makassar-fokus-perbaikan-lima-sektor/

[79] BPS, 2019 and 2020 - https://sulsel.bps.go.id/pressrelease/2020/12/01/541/perkembangan-pariwisata-dan-transportasi-sulawesi-selatan--oktober-2020.html

Existing tourism offering

Some tourist destinations that are frequently visited and have the potential to be developed in the city of Makassar are:

- The heritage tourism areas of the old city of Makassar include Fort Rotterdam, the colonial architecture of office buildings, churches and houses which have been partially revitalized into cafes and restaurants, Fort Rotterdam, and China town
- Losari beach pavilion, which is a public space on the beach where you can enjoy the sunset
- Somba Opu Street souvenir shopping centre
- Fort Rotterdam Corridor - Somba Opu souvenir shophouses - Losari Beach pavilion
- Pinisi traditional boat port, Paotere
- Lakkang small island eco-tourism in Tallo river
- Agglomerated culinary tours in the old city of Makassar, and also scattered in several new activity centres
- The small island of Samalona with white sand is attractive for snorkelling and sunbathing activities.

Some of the tourist destinations outside the city of Makassar that are frequently visited by tourists include:

- A miniature park of Sulawesi in the ruins of the Somba Opu fortress, formerly the capital of the kingdom of Gowa, on the border between the city of Makassar and the district of Gowa
- Butterfly habitat and Bantimurung waterfall, in Maros district
- Ancient karst hill caves with ancient paintings in Maros district
- River channel tourism in the Rammang-Rammang karst area.

Figure 49: Paotere Pinisi Traditional Ship Port, Makassar [80]

[80] Australian Consulate-General, Makassar Indonesia, 2020

Recommendations for sustainable tourism development

Sustainable tourism development in Makassar should be based on the following recommendations:

- **Based on sustainable business principles,** developing tourism based on transparent and accountable business plan and good management, which opens the pro-active integrated participation of private entrepreneurs, small and medium-sized businesses, with assisted dan controlled by the Makassar municipal government
- **Based on the principles of social sustainability**, developing tourism is maintained by its uniqueness, identity and local socio-cultural values as one of the main capitals to attract tourists
- **Based on environmental sustainability principles** according to the carrying capacity of the environment, in the sense of preserving the uniqueness and natural characteristics as well as man-made elements which are local characteristics, as one of the main capitals to attract tourists
- **Developing several types of tourism, such as:**
  - Development of tourist destinations with require large costs, for example the development of a world rare flora and fauna park on Lakkang Island which is integrated with a biotechnology research centre
  - New tourism development with moderate costs, such as cruises along the coast and small islands and / or small island tourism development such as Lae-Lae Kecil, revitalization of Kayangan Island tourism, Samalona island tours, Lanjukang island tours and small islands others
  - New tourism developments at relatively small costs such as city tour package one day buses and / or revitalization of walking tours along the legendary tourist corridor of Fort Rotterdam – Somba Opu souvenir shop - Losari promenade.

7.2.3 Digital economy

Indonesia's digital economy in context

The digital economy in Indonesia is growing fast and is the third-largest mobile market in APAC [81]

By going digital, Indonesia hopes to achieve up to USD 150 billion in growth (10% of GDP) by 2025 [82]. At the start of 2020, there were 175.4m Indonesians connected to the internet [83] (65% of the total population) [84]

2020 Go Digital Vision and Indonesia's *e-Commerce Road Map* (2015) supports the growth of the e-Commerce ecosystem for agriculture, fishery and SMEs (Small and Medium Enterprises) to digitize, expand the marketing network and increase employment [85]

- Indonesia's e-commerce market size reached 13 billion USD in 2018 and has grown 50% each year for the last 2 years [86]
- 57 million MSMEs (Micro, Small and Medium Enterprises) are operating, employing ~97% of the sector workforce [87]
- e-commerce is expected to support and help approx. 56 million micro, MSMEs that contribute about 55% of the GDP [88]
- e-commerce users in Indonesia are predominantly female in all provinces [89]
- In ICT companies, programmers are mainly male with the ratio around 1 female to 9 males [90].

In the next five years, the forecasted number of mobile subscribers will reach 199 million, with 177 million using their mobile services for internet access [91]

Indonesia is expected to account for nearly 40% of all ASEAN growth in start-ups in the coming years [92]

Expected to grow by 18% annually in the next five year, creating unprecedented job opportunities for the country's young population and by 2022 (e-commerce could account for 20% of the country's workforce, up from 3% just five years earlier) [93]

Development of the digital economy in Indonesia is limited to urban areas [94] and several provinces with high technology capabilities [95]

[81] https://www.gsma.com/newsroom/press-release/gsma-indonesia-on-brink-of-becoming-digital-economy-giant/

[82] https://www.mckinsey.com/~/media/McKinsey/Locations/Asia/Indonesia/Our%20Insights/Unlocking%20Indonesias%20digital%20opportunity/Unlocking_Indonesias_digital_opportunity.ashx

[83] https://oxfordbusinessgroup.com/analysis/supportive-framework-government-and-regulators-are-taking-steps-develop-digital-economy-focus-local#:~:text=The%20digital%20economy%20is%20transforming,sharing%20economy%20and%20boosting%20consumption.&text=There%20were%20around%20175.4m,than%20%24100bn%20by%202025

[84] APJII. Laporan Survei: Penetrasi & Profil Perilaku Pengguna Internet Indonesia. Jakarta (Indonesia): Asosiasi Penyelenggara Jasa Internet Indonesia. Report; 2018

[85] https://www.baycurrent.co.jp/en/our-insights/pdf/Digitalization%20in%20Indonesia.pdf

[86] https://jakartaglobe.id/context/indonesias-e-commerce-market-larger-than-estimated-consumer-habits-changing-study

[87] https://apfcanada-msme.ca/sites/default/files/2019-03/Micro%20and%20Small%20Businesses%20in%20Indonesia's%20Digital%20Economy.pdf

[88] https://partners.wsj.com/bkpm/indonesia-new-economy/emerging-digital-economy-giant/

[89] https://ww3.frost.com/files/3115/2878/4354/Digital_Market_Overview_FCO_Indonesia_25May18.pdf

[90] https://blogs.worldbank.org/sites/default/files/preparing_ict_skills_for_digital_economy-revised_7mar2018.pdf

[91] https://oxfordbusinessgroup.com/analysis/government-initiatives-target-wider-broadband-coverage-indonesia

[92] https://atkapital.com/why-the-digital-economy-is-key-to-growth-in-indonesia/

[93] https://partners.wsj.com/bkpm/indonesia-open-for-business/indonesia-set-to-become-a-digital-economic-powerhouse/

[94] https://www.cambridge.org/core/books/digital-indonesia/recent-history-of-the-indonesian-ecommerce-industry-an-insiders-account/221A58592940494A5371D1182F6523AD

[95] https://e27.co/report-indonesias-digital-economy-development-occurs-only-in-urban-areas-as-disparity-continues-20200131/

Key challenges to digital economy growth in Indonesia

	**Lack of infrastructure/challenging geography**: ICT infrastructure is weak and digital usage is uneven among various business sectors.
	**Internet quality**: Mobile data quality can be very low [96]. Indonesia has one of the slowest internet connection speed in the Asia Pacific region [97].
	**Low digitalisation across key sectors** [98]: for example, around 51 thousand schools (23.95%) are not connected to the Internet
	**Lack of skilled workforce**: Skilled workers is the biggest challenge due to a projected shortage of 9 million ICT workers 2015-30 [99]
	**Cultural**: Indonesia's connected citizens are tech-savvy, but overall Internet penetration is low.
	**Affordability**: Many people cannot afford unlimited and stable Internet connection [100].
	**Regulations**: Regulations may hinder growth by enforcing the law unequally between the local and global e-commerce players [101].

The above national figures for digital penetration were included as a proxy measure for Makassar due to lack of city-specific information.

Technology and digital inclusion

Despite the growth in internet use in Indonesia since the mid-2000s, there remains a gender gap in the country's internet users with many Indonesian women still not knowing how to effectively use digital media or the internet, particularly in relation to business / enterprises. [102] Key reasons noted for the gender digital divide in Indonesia include a lack of opportunities (access and skills) for use of technology.

Data (and particularly disaggregated data) on digital inclusion in Makassar is not readily available, however a 2018 study on digital inclusion in Eastern Indonesia (which includes Makassar) provides a good indication of conditions in Makassar. The study focused on exploring the potential of digitalisation for inclusive socio-economic development [103] and found that only 15% of 143 million Indonesian internet users are located in Eastern Indonesia. About half of the

[96] https://www.mckinsey.com/~/media/McKinsey/Locations/Asia/Indonesia/Our%20Insights/Unlocking%20Indonesias%20digital%20opportunity/Unlocking_Indonesias_digital_opportunity.ashx

[97] https://www.aseanbriefing.com/news/indonesias-e-commerce-sector-market-potential-challenges/

[98] https://www.mckinsey.com/~/media/McKinsey/Locations/Asia/Indonesia/Our%20Insights/Unlocking%20Indonesias%20digital%20opportunity/Unlocking_Indonesias_digital_opportunity.ashx

[99] https://blogs.worldbank.org/sites/default/files/preparing_ict_skills_for_digital_economy-revised_7mar2018.pdf

[100] https://theconversation.com/lack-of-internet-access-in-southeast-asia-poses-challenges-for-students-to-study-online-amid-covid-19-pandemic-133787

[101] https://www.intechopen.com/online-first/the-paradox-of-indonesian-digital-economy-development

[102] Suwana, L. F. 2017. Empowering Indonesian Women Through Building Digital Media Literacy. Kasetsart Journal of Social Sciences, Vol. 38.

[103] Centre for Strategic and International Studies. 2018. Exploring the Potential of Digitalization for Inclusive Socio-Economic Development in Eastern Indonesia. https://www.csis.or.

respondents in the study indicated that they are internet users, while the other half are not. Of the internet users, 88% accessed the internet from their smartphones. Furthermore, more than 40% of the respondents find issues with internet stability, speed, price and coverage in Eastern Indonesia. Social networking and news consumption were the two most frequently performed online activities by respondents. Commerce-related activities such as shopping and trading were among the least frequently performed activities.

Key issues identified by the study, and which have particular relevance for consideration of digital inclusion in Makassar include:

- **Lack of public awareness.** Indeed, while the utilization of digital technology for public services delivery in Indonesia has existed in various forms for some time, a central issue is lack of public awareness that public services can be accessed online. Only about 42% of respondents were aware of the online presence of such services.
- **Lack of innovation by local governments**, who lack the digital knowhow to adjust various existing online systems to serve local needs.
- **Necessity for further development of public online system**. Respondents (about 60%) identified the need for a more comprehensive system, as the current state of online systems still inconveniently requires them to physically go to public offices for some other parts of the online application, for example. Furthermore, as many as about 40% of respondents are not even aware of the existence of online platforms to communicate with local government, such as 24/7 Call Center, government website or social media. For the purpose of effective public communication and feedback, both local government websites and social media have massive room for improvement as many of them have not been updated for years.

Some of the key sectoral interventions in Makassar, based on the above assessment, should focus on[104]:

- Capacity building activities, given the poor public awareness of digital technology, should be specifically targeted to three different local stakeholders: (a) government officials, (b) local public service workers and (c) local businesses and MSME. Furthermore, local communities could benefit from workshops or seminars, intended for a large, general audience, that are designed to provide basic general knowledge of the potential benefits of digital technology. Indeed, better access and skills, particularly for women, is a key way in which existing gender inequalities can be challenged – including in communication, education, and employment / income generation. Focus should also be placed on capacity building by women, for women.
- For lower level government officials / civil servants, basic workshops on digital technology should be complemented with technical and hands-on trainings aimed to develop and maintain simple platforms to deliver and support various government programs.
- In addition to capacity-building, assistance programs may also involve projects to develop online platforms, that are designed to specifically cater to local needs. A potential example is the development of social media pages for technical offices of local government.
- Given the lack of comprehensive digital infrastructure, particularly in slum settlements, interventions that can be complemented by the development of digital facilities in public areas are recommended. This includes public Wi-Fi, particularly in areas with tourism potential. This can be done with the collaboration of local government or related service providers and will also foster more inclusive digital penetration and access across the city.

[104] Centre for Strategic and International Studies. 2018. Exploring the Potential of Digitalization for Inclusive Socio-Economic Development in Eastern Indonesia. https://www.csis.or.

Key digital economy opportunities for Indonesia

Figure 50: Benefits to Makassar from a holistic plan [105]

Infrastructure

It is vital to expand international linkages and bandwidth beyond the greater Jakarta area by strengthening connectivity

Indonesia must enhance 4G/ LTE infrastructure outside Java to enable users to take advantage of the falling handset prices and increase 4G penetration beyond the 2015 level of 7.6%.

Mobilising a skilled workforce

McKinsey estimates that, of the >35m non-working female citizens between 15 and 64 years old in Indonesia, 3% of this population can be activated through online platforms, adding 1 million people to Indonesian workforce.

Reducing poverty and improving City wide prosperity

Use of big data, to support operations and sales could contribute to the manufacturing and farming sectors to become connected and more efficient, enabling expansion

[105] https://www.mckinsey.com/~/media/McKinsey/Locations/Asia/Indonesia/Our%20Insights/Unlocking%20Indonesias%20digital%20opportunity/Unlocking_Indonesias_digital_opportunity.ashx

Trends of smart city economic development in Makassar

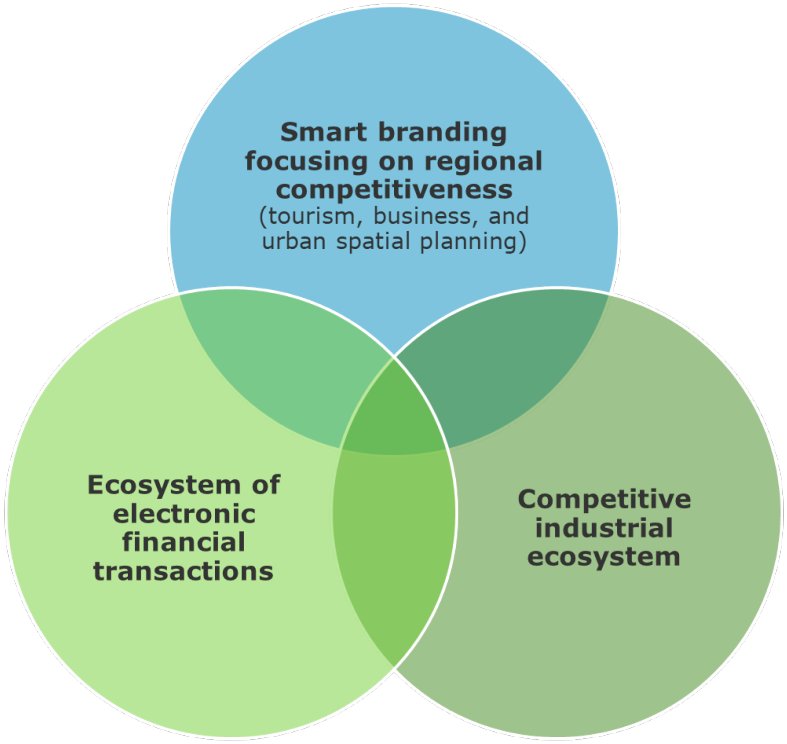
For the purposes of this Situation Assessment, the national trends are indicative of the current digital economy in Makassar. As part of ongoing investigations, the national digital economy characteristics will be compared to the trends present in Makassar.

The Makassar Regional Long Term Development Plan (RPJMD) [106] of Makassar City is in a transition period. It is important that future revisions to the RPJMD consider the implications for the digital economy and expanding accessibility of citizens to the Internet, particularly in key sectors (e.g. education).

The policy direction and development strategy of urban areas during the COVID19 pandemic remains focused on:

1. The application of smart city principles to support economic activity during the COVID-19 pandemic
2. Strengthening disaster management especially in higher-risk urban areas compared to non-urban areas, with large populations, high density and large investments. [107]

Figure 51: Elements of smart economic development



[106] The preparation of the 2020-2021 Regional Development Work Plan (RKPD) is guided by five things. First, the Minister of Home Affairs Regulation Number 2 of 2008 concerning Minimum Service Standards with 6 mandatory basic service affairs. Second, the Circular of the Minister of Home Affairs Number: 050/5038 Bangda dated 3 October 2018 regarding the preparation of the 2020 RKPD for Makassar City. Third, the policy direction and targets of the Makassar City RPJPD for 2005 to 2025, Fourth, the development priorities of the 2018-2023 RPJMD for the South Sulawesi Province, and Fifth, the results of the 2014-2018 SKPD Strategic Plan control and evaluation. Currently at the stage of the initial draft public consultation forum, it is carried out to harmonize proposals between the results of the Kecamatan Musrembang with the Draft Work Plan (Renja) for Regional Apparatus, as well as suggestions and input on improving the RKPD for each SKPD.

[107] Speech President Republic Indonesia On Trial Annual Assembly Permusyawaratan The people and Trial Together Council Representative People and the Council Representative Area, Jakarta, 14 August 2020.

7.2.4 Investment attraction (Friendly to investment)

Investment profile

The Office of Investment and Integrated Services, (DPMPTSP) of South Sulawesi Province records FDI and domestic investment. [108]

FDI realization from 2016 to March 2020 is summarised in Table 24 highlighting United Kingdom amounted to US $ 179,801.40 thousand (36.6%), Malaysia US $ 166,236.20 thousand (33.8 %), Hong Kong (SAR) US $ 65,028.60 thousands (13.2%).

Table 24 FDI Profile in Makassar 2016-Mar 2020 (USD '000) [109]

COUNTRY	TOTAL VALUE US$ (THOUSANDS)	2016	2017	2018	2019
United Kingdom	179,801	1,427	176,655	1,361	346
Malaysia	166,236	3,044	22,092	74,716	66,381
Hong Kong (SAR)	65,028	41,213	16,029	5,927	1,848

Regulation

At the start of President Jokowi's second term, to support the PKE, the Government of Indonesia issued Omnibus Law on Employment Creation and Taxation. There are 76 laws amended under the Omnibus Law, which is aimed at boosting investments and create more jobs in Indonesia. Among others, the Omnibus Law introduces provisions to simplify business licensing procedures and changes to the existing manpower law. Future investors will only need to refer to this law rather than going through 76 or more laws when trying to invest in Indonesia.

The Omnibus Law is aimed at providing increased ease of doing business, for example in the taxation, it says that it will reduce the income tax (PPh/*Pajak Penghasilan*) down to 20% until 2023, where currently PPh for companies is around 25%. Then the Law also said that the tax on dividends will be eliminated, if it is reinvested in Indonesia and foreign nationals are only taxed on income received in Indonesia.

There are 11 clusters within the Omnibus Law:

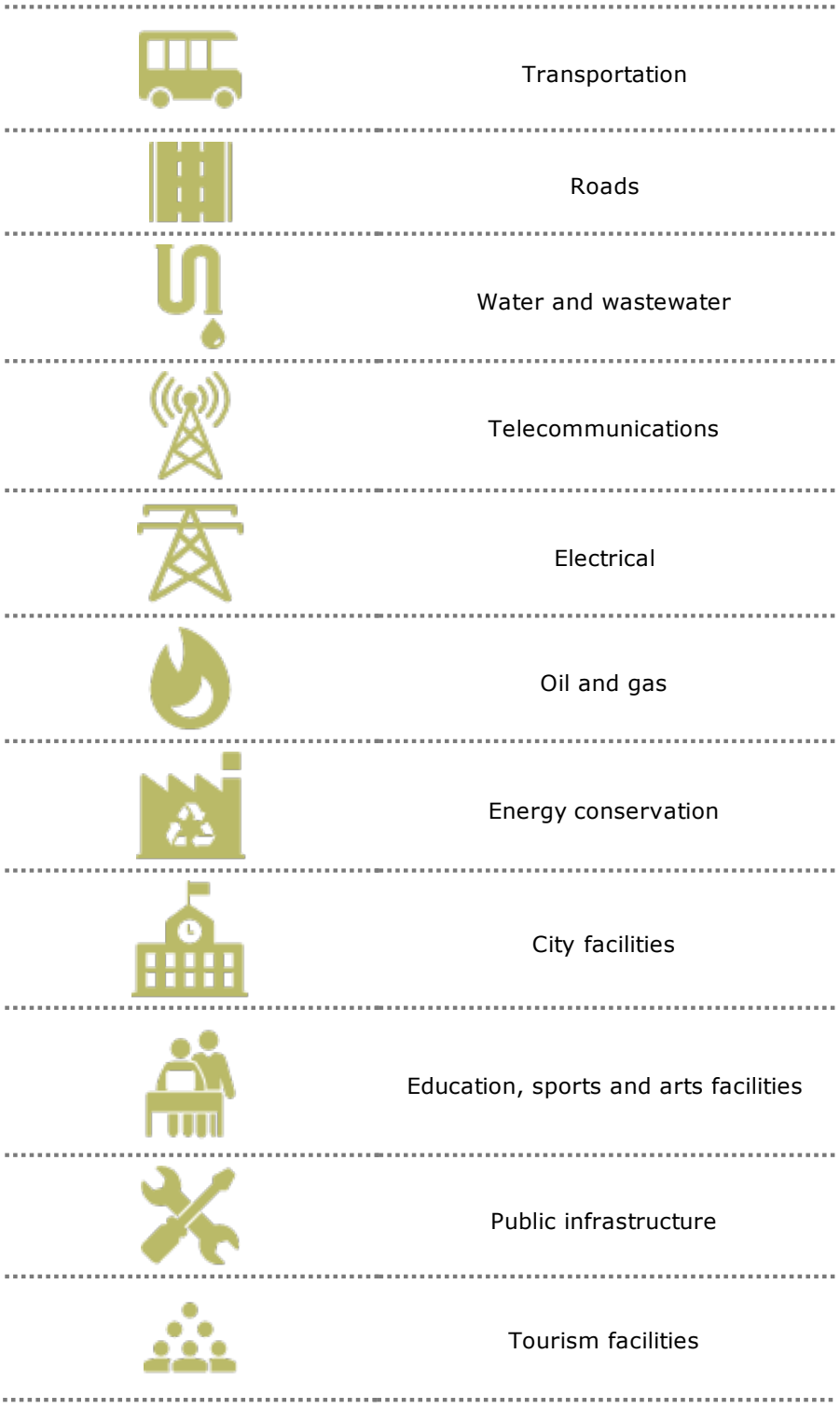
1. Simplification of land licensing
2. Investment requirements
3. Employment
4. Convenience and protection for Small Medium Enterprises
5. Ease of doing business
6. Innovation and Research Support
7. Government administration
8. Imposition of sanction
9. Land controlling
10. Ease of government project
11. Special Economy Zone

[108] https://dpmptsp.sulselprov.go.id/publik-read?id=kepala-dpmptsp-sulsel-merilis-realisasi-investasi-triwulan-ii-tahun-2020-sebesar-3.7-trilyun ; https://inipasti.com/realisasi-investasi-sulsel-2019-tak-capai-target/

[109] DPMPTSP

Another effort taken by the Government of Indonesia in increasing its economy is by endorsing the Public Private Partnerships for infrastructure. The PPP regulations and guidance includes provision for a range of infrastructure projects to be delivered via PPP arrangements.

Figure 52: PPP targets



7.3 INCLUSIVE AND TRANSPARENT FINANCIAL SUSTAINABILITY

7.3.1 National budget

Government Regulation No. 12/2019 on Regional Financial Management provides the legal basis of the regional financial management system of activities that include planning, budgeting, implementation, administration, reporting, coverage, and supervision of regional finance. [110]

The national budget deficit is falling. In 2021 State Budget Bill [111], the budget deficit is projected at 5.5% of GDP or Rp971 trillion. This is lower than the budget deficit in 2020 of 6.34% of GDP or Rp1,039 trillion. [112] The focus of the national budget is summarised in Table 25.

The overall state expenditure policies are expected to support the achievement of the following development targets in 2021:

- Unemployment rate of 7.7-9.1%
- Poverty level of 9.2-9.7 percent
- Inequality of 0.377-0.379,
- Human Development Index (HDI) of 72.78-72.95.

7.3.2 Municipal financing framework

Regulations governing the city financial affairs include:

- Mayor Regulation No. 26 of 2019 on Third Amendment to Mayor Regulation No. 57 of 2014 on Local Government Financial Management Systems and Procedures of Makassar City
- City Government Regulation No. 1 of 2014 on Responsibility for Implementation of the Revenue and Expenditure Budget
- City Government Regulation No. 4 of 2009 on Principles of Makassar City Financial Management

[110] This list is translated directly from the regulation

[111] Law of The Republic of Indonesia Number 9 Regarding The State Budget Fiscal Year 2021

[112] Cabinet Secretariat for the Republic of Indonesia, 2020. Presentation of the Government Statement on the Bill on the State Budget for the 2021 Fiscal Year and Its Financial Note Before the Plenary Session of the House of Representatives of the Republic of Indonesia. By office of Assistant to Deputy Cabinet Secretary for State Documents & Translation, 14 August, https://setkab.go.id/en/address-of-the-president-of-the-republic-of-indonesia-on-the-presentation-of-the-government-statement-on-the-bill-on-the-state-budget-for-the-2021-fiscal-year-and-its-financial-note-before-the-plenar/

Table 25: Summary of national budget investment in key sectors, Indonesia, 2021

SECTOR	BUDGET (RP TRILLION)	PROPORTION NATIONAL EXPENDITURE (%)	KEY ACTIVITIES
Transfer to Local Government and Village Funds	Rp 796 trillion	29%	• Healthcare services • Social safety net • Economic recovery from the impact of COVID-19
Education	Rp 550 trillion	20%	• Improving human resources quality • Capacity to adapt to the ever-changing technology, and productivity through better knowledge in digital economy • Leadership transformation of school principals • Transformation of education and teacher training
Infrastructure Development	Rp 414 trillion	15%	• Economic recovery • Provision of basic services • Improved connectivity
National Economic Recovery	Rp 365 trillion	13%	• Healthcare • Social protection
Health	Rp 169.7 trillion	6.2%	• Procurement and distribution of vaccine • Nutrition for mothers and toddlers • Management of infectious diseases • Effective national health insurance • Disease prevention, detection and response • Integrated health system
Food security	Rp 104 trillion	4%	• Promoting production of food commodities through development of facilities and infrastructure and utilization of technology • Revitalizing the national food system by strengthening farmer and fisherman corporations and food distribution; and developing large-scale food estates to increase food productivity
ICT	Rp 30.5 trillion	1.1%	• Accelerating government digital transformation • Ensuring effective and efficient public services, particularly in the education, health, and government sectors • Consolidating and optimizing shared infrastructure and services • Ensuring public participation in priority development areas and promoting equality with additional internet access in approximately 4,000 villages and Kecamatan in 3T regions
Tourism Development	Rp 14 trillion	0.5%	• Encourage economic recovery in the tourism sector • The policy is carried out through tourism recovery by developing 5 priority tourist destinations: Lake Toba, Borobudur, Mandalika, Labuan Bajo, and Likupang

7.3.3 Analysis of municipal finances

Revenue analysis: taxes, tariffs and transfers

Table 26 provides a summary of the balance sheet for Makassar for 2018 and 2019, disaggregating income, central and regional transfers, income and expenditure. Key issues arising include:

- Expenditure exceeds income each year over 2016-2020, although it appears to be narrowing, meaning income and expenditure are more closely aligned
- Fluctuating amounts of income and expenditure.

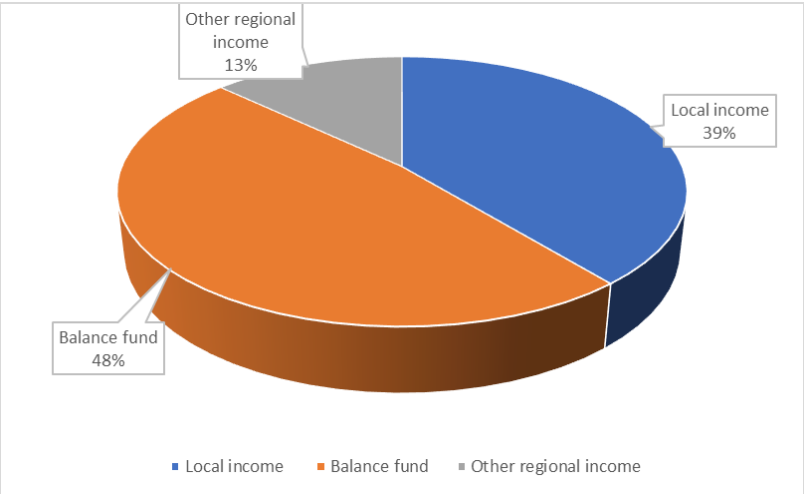
Table 26: Makassar City Budget overview, 2016-2020, ID rupiah, billions

		2016	2017	2018	2019	2020
Budget	Surplus/ deficit	-166	-422	-219	-163	-79
Income		3,659	3,394	3,898	4,100	4,139
	Local income	1,305	1,333	1,484	1,649	1,749
	balance fund	1,617	1,838	1,910	1,911	1,852
	other regional income	737	224	504	539	537
Expenditure		3,825	3,816	4,118	4,263	4,218
	indirect expenditure	1,510	1,439	1,305	1,224	1,650
	Direct expenditure	2,316	2,377	2,813	3,039	2,568

There are 3 elements to income for the city of Makassar:

- Local income
- Central transfers via Balance Fund
- Central transfers via Other Funds

Figure 53: Average income to Makassar City, 2016-2020 [113]



[113] OECD, 2019. RAISING MORE PUBLIC REVENUE IN INDONESIA IN A GROWTH- AND EQUITY-FRIENDLY WAY ECONOMICS DEPARTMENT WORKING PAPERS No. 1534. OECD, 45pp. https://one.oecd.org/document/ECO/WKP(2019)3/en/pdf

Table 27: Income to Makassar City, 2016-2020 (IND Rupiah billions)

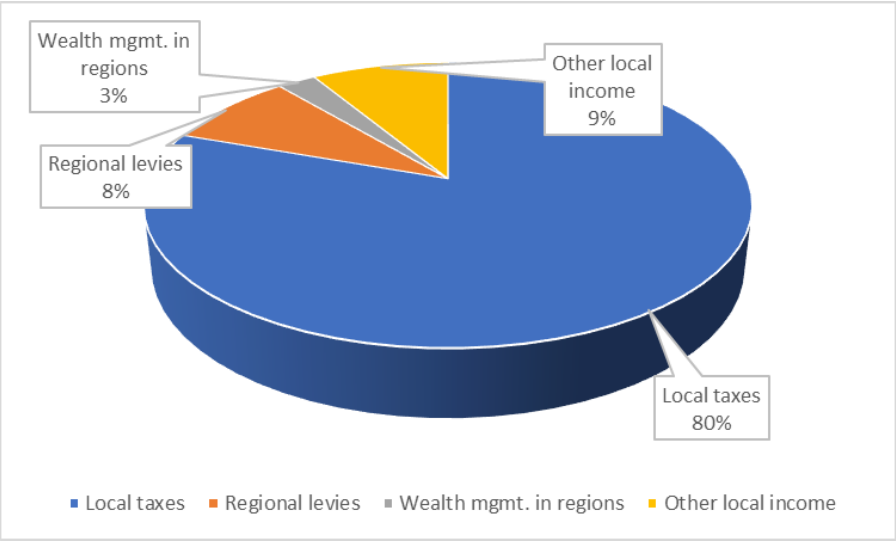
	2016	2017	2018	2019	2020	AVERAGE %
Local income	1,305	1,333	1,484	1,649	1,749	39%
Balance fund	1,617	1,838	1,910	1,911	1,852	48%
Other regional income	737	224	504	539	537	13%

Of the income to Makassar, 39% comes from local taxes and levies – disaggregated further in Table 28; 48% from Balance Funds and 13% from other regional incomes. The importance of local taxes in Makassar is 35%, considerably higher than the average for Indonesia 12%.[114] The majority of local income is in the form of local taxes – see Table 28 – with regional levies being a second source of income.

Table 28: Income from local taxes, levies and wealth management, 2016-2020, IND rupiah billions [115]

	2016	2017	2018	2019	2020	AVERAGE
Local income (TOTAL)	1,305	1,333	1,484	1,649	1,749	
Local taxes	1,063	1,063	1,156	1,315	1,451	80%
Regional levies	146	95	133	133	128	8%
Wealth mgmt. in regions	14	31	45	47	47	2%
Other local income	81	144	149	155	124	9%

Figure 54: Local income, averages, 2016-2020 [116]



[114] OECD, 2019. RAISING MORE PUBLIC REVENUE IN INDONESIA IN A GROWTH- AND EQUITY-FRIENDLY WAY ECONOMICS DEPARTMENT WORKING PAPERS No. 1534. OECD, 45pp. https://one.oecd.org/document/ECO/WKP(2019)3/en/pdf

[115] OECD, 2019. RAISING MORE PUBLIC REVENUE IN INDONESIA IN A GROWTH- AND EQUITY-FRIENDLY WAY ECONOMICS DEPARTMENT WORKING PAPERS No. 1534. OECD, 45pp. https://one.oecd.org/document/ECO/WKP(2019)3/en/pdf

[116] OECD, 2019. RAISING MORE PUBLIC REVENUE IN INDONESIA IN A GROWTH- AND EQUITY-FRIENDLY WAY ECONOMICS DEPARTMENT WORKING PAPERS No. 1534. OECD, 45pp. https://one.oecd.org/document/ECO/WKP(2019)3/en/pdf

There are several mechanisms for central transfers to Makassar city including

- General Allocation Fund and Special Allocation Fund – average allocation between 2016-2020 is shown in Figure 56
- Other mechanisms – average allocation between 2016-2020 is shown in Figure 57.

Figure 55: Central transfers via Balance Fund (average % 2016-2020) [117]

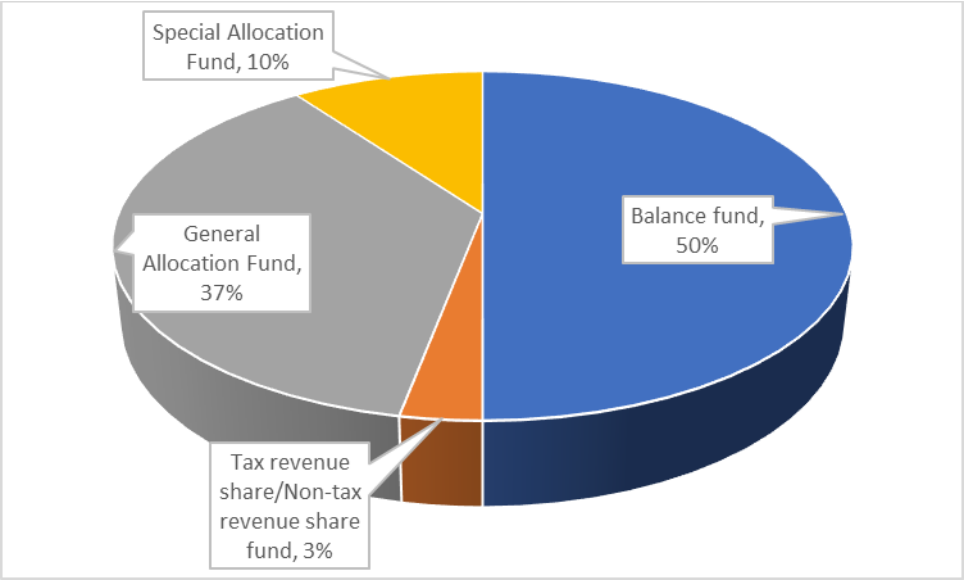
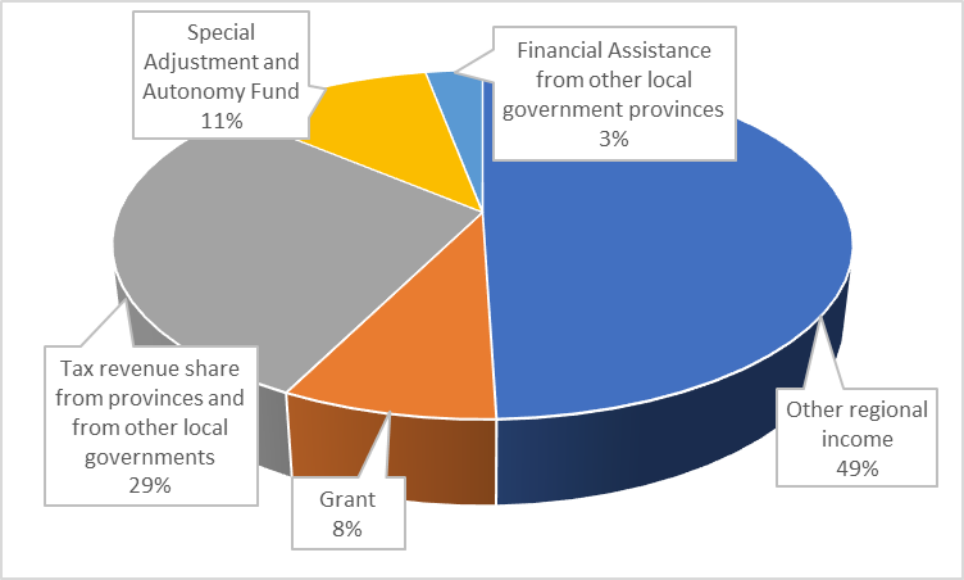


Figure 56: Central transfers via Other Funds (average % 2016-2020) [118]



[117] OECD, 2019. RAISING MORE PUBLIC REVENUE IN INDONESIA IN A GROWTH- AND EQUITY-FRIENDLY WAY ECONOMICS DEPARTMENT WORKING PAPERS No. 1534. OECD, 45pp. https://one.oecd.org/document/ECO/WKP(2019)3/en/pdf

[118] OECD, 2019. RAISING MORE PUBLIC REVENUE IN INDONESIA IN A GROWTH- AND EQUITY-FRIENDLY WAY ECONOMICS DEPARTMENT WORKING PAPERS No. 1534. OECD, 45pp. https://one.oecd.org/document/ECO/WKP(2019)3/en/pdf

Expenditure analysis

The expenditure profile of Makassar City remains in close alignment with its revenue and is summarised in Table 29.

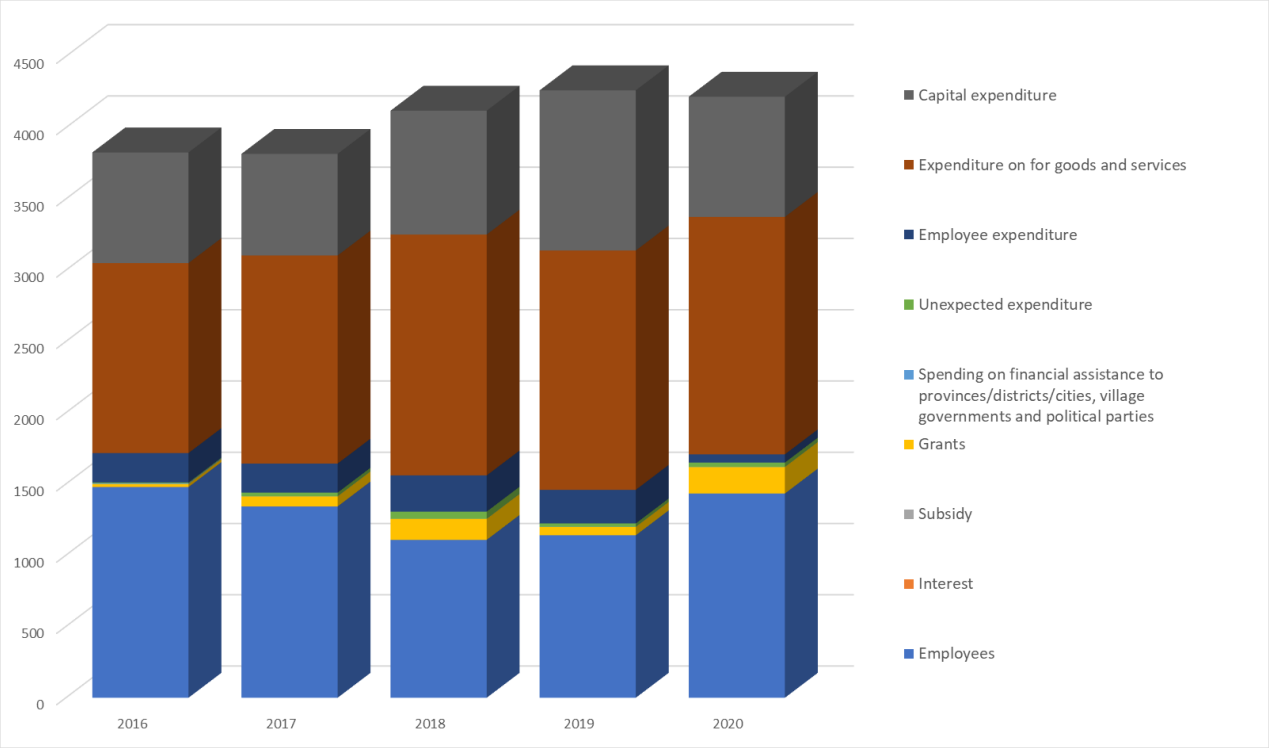
The World Bank's Public Expenditure Review highlights both the critical lack of fiscal space owing to a lack of revenue impacting a concomitant low expenditure, and the need to target the right interventions, with a renewed focus needed on infrastructure and early childhood education. [119]

Table 29: Regional expenditure, Makassar City, IDR billions, 2016-2020E

REGIONAL EXPENDITURE	2016	2017	2018	2019	2020
A. Indirect expenditure	1,510	1,439	1,305	1,224	1,650
Employees	1,478	1,342	1,108	1,140	1,433
Interest	1	1	-	-	-
Subsidy	-	-	-	-	-
Grants	21	70	147	59	186
Spending on financial assistance to provinces/districts/cities, village governments and political parties	5	1	1	1	1
Unexpected expenditure	5	25	50	23	30
B. Direct expenditure	2,316	2,377	2,813	3,039	2,568
Employee expenditure	207	204	254	236	58
Expenditure on for goods and services	1,333	1,460	1,690	1,679	1,666
Capital expenditure	776	713	869	1,124	843
Total regional expenditure	3,825	3,816	4,118	4,263	4,218

[119] World Bank, 2020. Indonesia Public Expenditure Review: Spending for Better Results 2020. World Bank, Washington DC, USA, http://pubdocs.worldbank.org/en/781931592798309485/Indonesia-PER-main-findings.pdf

Figure 57: Regional Expenditure 2016-2020



Summary

Analysis of city finances shows that the City of Makassar experiences the following key pressures.

- Makassar is running a deficit with expenditure exceeding income each year across 2016-2020
- Makassar experiences fluctuating income and expenditure year to year
- Makassar relies on central funds for approximately half of the city's revenue
- Makassar has an average local tax income that is higher than national average (35% of total revenue)

7.3.4 Needs and development plan

The key challenges facing cities across ASEAN from an economic and financial sustainability viewpoint are summarised for Makassar in Table 30.

Table 30: Makassar's key economic and financial challenges, summary

CHALLENGE	SITUATION ASSESSMENT	MORE INFORMATION NEEDED
Basic services provision	See Chapter 6 on Social Issues for full description	Budget allocations for specific poverty investments
Urbanisation	Evidence of increasingly urbanisation is not borne out by the population data.	Data on population trends in the suburbs and satellite towns of Makassar (outside the official city boundary)
Flexibility	Further research is required here to ascertain existing flexibility in Makassar	Decision-making processes Opportunities for leveraging local revenues or hypothecating these How digital data and processes are being integrated into financial management systems
Competitiveness (on smart and digital)	Makassar is considered a leader in Indonesia for smart and digital elements Several projects (including for the ADB) are ongoing to ascertain competitiveness of the city	Evidence of spend and other subsidies and investments by the city in smart and digital and in elevating competitiveness
Finances	Makassar finances appears to be managed well, with a relatively small and narrowing annual overspend, a relatively high level of financial autonomy with local revenue accounting for over one-third of total revenue.	Disaggregation of the composition of local revenues and expenditure

For the AASCTF technical assistance programme, we are assessing financial sustainability using the DRIFT [120] (Data, Revenue management, Inclusivity, Financial models, Transparent decisions) approach to ascertain the foundations of smart and digital in the city and the opportunities/ risks for embedding these. For this Situation Assessment, the DRIFT analysis is provided in Table 31.

Table 31: Makassar DRIFT assessment for financial sustainability

CHALLENGE	SITUATION ASSESSMENT	ACTIONS REQUIRED
Data	Solid data series are available, but improvements should be made to improve decision support from data	• Data disaggregated to socioeconomic groups, industrial sectors and Kecamatan for citizens
Revenue management	Appears strong although our understanding is at a high-level	• Understand from the city how decisions made around revenue (taxes etc), the levels of autonomy of the city, the information needed to improve • The sources of the revenue are key to understand
Inclusivity	See section on GESI	• The economic reality of poverty and under-supplied access to essential services and utilities – health, energy, shelter, water and food – and the potential to re-align the budget and investments of the city to deal with these challenges. • The impact of current policy, investment, etc on the population
Financial models	Limited information available	• Evidence of spend and other subsidies and investments by the city in smart and digital and in elevating competitiveness • The role of the private sector in the functioning of Makassar from an economic and financial viewpoint needs to be better understood.
Transparent decisions	Limited information available	• Decisions are lacking evidence and transparency, including: – Data disaggregated by socioeconomic grouping and region/ province/ district – Population growth areas and attendant socioeconomic groupings – Responsibility, accountability, transparency and the scope of decisions – Views of the population on key issues, priorities – Views of the business community

[120] See AASCTF, 2020. Financial sustainability principles for smart cities. AASCTF Briefing, Draft, 20 December.

7.4 GENDER, YOUTH, AND INCLUSION

STATISTICS OF GENDER, YOUTH AND INCLUSION

DIVERSITY

- The city consists of four main ethnic groups, Makassar, Bugis, Toraja, Mandar, and the Tonghoa, as well as migrants in smaller numbers from Maluku, Java, Manado.
- Among the Makassar population 89.8% are Muslims, 6.2% are Protestant Christians, 2.8 % are Catholic Christians, 1.08% are Buddhists and 0.11% are Hindus.

WOMEN AND CHILDREN

- Makassar has a female (50.5%) to male (49.5%) ratio.
- 27.9% of the total population are between the age group of 0-14 years.

OLDER PERSONS AND PEOPLE WITH DISABILITIES

- 3.56 % of the population are in the age group of 60-70 years and 1.87 % are in the age group of 70+ years.
- There are an estimated 36,000 people in Makassar who have some form of disability.

7.4.1 Cultural Norms and Beliefs

Indonesia is one of the most ethnically diverse countries in Asia, and Makassar is no exception. Makassar has experienced a large population increase over time with a diverse background of characteristics, covering aspects of ethnicity, religion, and region of origin. These diverse backgrounds have given rise to community groups with their own cultural values and beliefs in the city. Ethnically the city is dominated by the Bugis and Makassarese, both having a strong profile within Indonesia. There are also smaller numbers of Toraja and Mandar ethnic groups. There is a sizeable Chinese community, at around 3.5% of the population. Then there are also pockets of temporary and permanent migrants from the eastern islands as far as Papua. Both intra- and inter-ethnic rivalry is common, but there is a comparative low rate of violent communal conflicts.

The majority of Bugis and Makassarese are devout Muslims, and prayer and religious festivals dominate the cultural life of the city. Mosques are on almost every street corner. The Mandar tribe are Muslims; the Torajans are mostly Christian. Many migrants from the eastern islands are Christian. In short, the diversity of people's backgrounds today, both in terms of ethnicity, religion, and cultural traditions, shows a more positive impact on the dynamics of city development, compared to the negative impact.

The province is considered a stronghold of Islam, as noted above. Following political decentralisation and due to the growing Islamization movements in Indonesia, South Sulawesi has the second largest number of sharia-based bylaws after the Islamic Province of Aceh. Most of the regional sharia-based by-laws in South Sulawesi regulate women's clothing, the requirement to read the Qur'an, and the payment of zakat (or almsgiving). Cultural norms and beliefs, particularly around gender roles, are therefore strongly rooted in Islamic traditions which apply

more conservative definitions of women's role in society, with similarly conservative perceptions on the LGBTIQ+ communities.

The ethnic Bugis are noted to have five genders that coexist in harmony. Aside from makkunrai (women) and oroané (men), the Buginese society identifies calalai (transgender females), calabai (transgender males) and bissu. Bissu is the fifth gender, which embodies all genders or none of them: it transcends gender. In general, the gender concept of the West is equality and equal partnership between men and women in all aspects. The Bugis possess a gender system that is formally elaborated but does not comprise a primary organizational principle of their culture. Women and men are absorbed equally in a preoccupation with social location. For both sexes hierarchical distinctions are differentiated in the same social continuum on the basis of what appears to be individual ascription and achievement. Patterns of gender differentiation merely comprise general paths--different for men, women, and calabai (male transvestites)--that individuals follow in their respective quests to know their social locations.[121]

7.4.2 Gender

The Office of Women Empowerment and Child Protection partners with various Non-Governmental Organizations (NGOs) engaged in delivering empowerment activities for women as well as provide protection for displaced children. Major functions of the organization include:[122]

- Improving the quality of women, through various types of training and skills courses.
- Fulfilment of rights and advocacy for the benefit of children.
- Protection of women, especially in the form of domestic violence.

A primary socio-cultural barrier to women's empowerment in Makassar consists of gendered assumptions about the role of men and women, which has implications for everyday practices within government, businesses, households and at the individual level.

These barriers are sustained and reinforced by the failure of regulatory institutions to implement and enforce legal provisions promoting gender equality.

Indonesia ranks 85th in the Global Gender Gap Index[123] out of 153 countries, dropping from 68th position in 2006. Comparatively, Indonesia's performance as measured in the Global Gender Gap sub-indices are close to the overall average scores for education and health, however on political empowerment the country scores well below the average, while on economic participation and opportunity it performed above the average score.

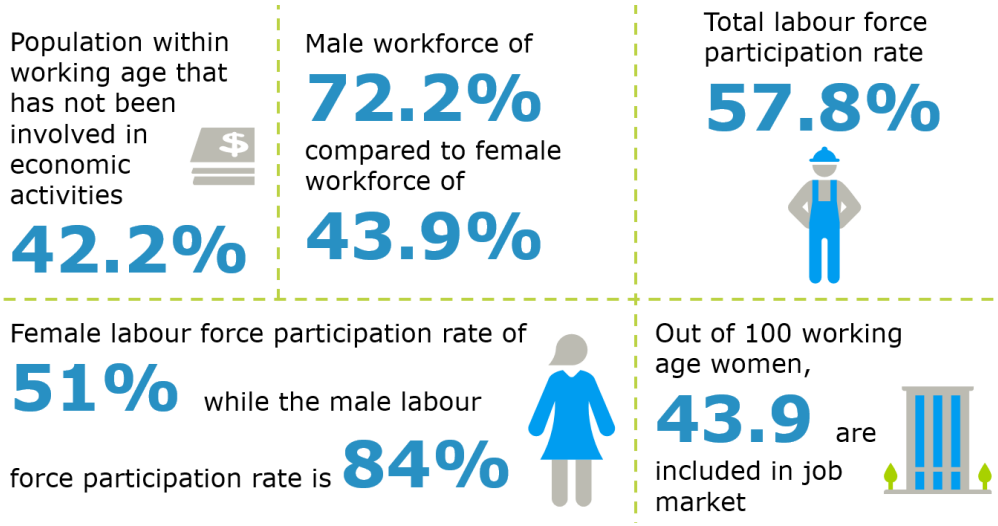
Resistance to the concept of gender equality can still be strong in Indonesia, and as noted by the World Bank the term gender is still misunderstood, and "gender mainstreaming efforts in both the government and non-government sectors remain narrowly focused on increasing female participation, rather than being more broadly focused on issues of human rights, advancement and empowerment, and disparities between women and men's economic opportunities".

Despite Indonesia's dramatic economic change over the past two decades, the participation of women in the paid labour force has seen little change.

At around 51%, the female labour force participation rate in Indonesia is well below that of males (around 84%). The Labour Force Participation Rate in Makassar is low, 57.8%. The percentage of

[121] Millar, S. B. 1983. On Interpreting Gender in Bugis Society. American Ethnologist. Vol. 10 (3).
[122] Dinas P3A, Makassar, 2020
[123] World Economic Forum. 2020. Global Gender Gap Report 2020. http://www3.weforum.org.

the population within the working age that has not been involved in economic activities is 42.2%. The Labour Force Participation Rate also indicates a gap between the male workforce 72.16%, compared to the female workforce 43.9%. Out of 100 working-age women, only 43.9 are included in the job market.



This is one of the factors that contribute to low income for households. Furthermore, while women actively contribute to the national and household economy, they are excluded from many decision-making structures and processes at the family, local and national level. Even when women are engaged in decision-making positions, they are often found on the side-lines, or occupy low-level positions. Women's lack of representation in decision-making positions is also a critical barrier to the development of economic and social policies that consider their specific social, political and economic perspectives and interests. [124]

According to Daraba et al [125] interviews with informants in Makassar indicate that the local culture adopted by the majority of citizens, especially the "older generation" domiciled in Makassar still embrace patriarchal culture. A primary socio-cultural barrier to women's empowerment in Makassar (and more broadly through Indonesia as note above) consists of gendered assumptions about the role of men and women in the public and private sphere, which has implications for everyday practices within the household, but also for the practice of governments, businesses, households and individuals. These barriers are sustained and reinforced by the failure of regulatory institutions to implement and enforce legal provisions promoting gender equality in society, the workplace, and in business.

Poverty is a key intersectional issue that exacerbates existing socio-cultural gender inequalities.

This is particularly the case for female headed households in Makassar. In recent years the number of female headed households has grown in the city. Based on 2019 data from the Office

[124] World Bank. (2013). Gender equality: Policy Brief 1. Gender mainstreaming. https://tinyurl.com/y7otk3cg.
[125] Daraba. D. 2018. Basic Public Service Partnership Model Based on Gender Perspective in Makassar City, Indonesia. Journal of Legal, Ethical and Regulatory Issues.

of Population Control, in Makassar City today there are 42,362 female headed households [126]. Among the 15 Kecamatan in Makassar, the five Kecamatan with the highest number of female family heads were Tallo, Biringkanaya, Tamalate, Panakkukang, and Rappocini. These Kecamatan are also noted to be the largest slum areas in the City. Feedback from KIIs conducted with government representatives to support this Situation Assessment indicate that progressive enlargement of slum settlements in the peripheral areas of the City is a key social issue, with particular impact for poor women, who are less able to access services and economic opportunities, among others.

Women from slum areas in Makassar, and particularly women-headed households, are noted to work predominantly in traditional markets (of which there are more than 10 in Makassar), street-side micro-shops, shopping centres as salesperson, service industries (hotels, restaurants, entertainment centres), public services, and other self-employed jobs. Of women employed in Makassar, 64% of jobs are in the informal sector, of which occupations are at high risk of exploitation. [127] Systematic barriers to women's empowerment (over and above poverty) are also a key factor, including fewer training opportunities for women, household responsibilities, and cultural or religious constraints.

Key informant interviews conducted in Makassar corroborate the above findings, including noting that gender-based mainstreaming is not yet a priority of all city policies and programs. Consideration of gender is therefore uneven and inconsistent. Furthermore, patriarchal culture was noted to remain strong, and that in-general, awareness and commitment to the issues of gender is considered to be low – both among government officials and civil society.
A cross-cutting issue of increasing importance in Makassar City, and more broadly through Indonesia and the region is in relation to gender responsive urban planning and responses for climate change and disasters. On this, key challenges mirror those described above, including exclusion of women as primary stakeholders in climate change-related policy-making processes. In addition, women are not provided with adequate information on climate change and its associated impacts. As a result, women's experience in responding to climate change impacts, as well as in preventing and adapting to them, are very often ignored and excluded in government's policy-making.

The National Commission on Violence Against Women (Komnas Perempuan) reported in 2018 that domestic violence is the most prevalent type of violence against women in Indonesia. Further, there remains widespread impunity for domestic violence perpetrators and a failure of state mechanisms to protect women. Misunderstandings about domestic violence at the community level inevitably impact institutional understandings (for example, of police officers) and affect the implementation of the laws. [128]

Lastly, a primary challenge in understanding gender dynamics and context in Makassar City is the relative paucity of data available that enables a nuanced understanding of the situation for women in Makassar.

[126] Dinas PPKB Makassar, 2020

[127] KII with Government Representatives. 2020. Makassar.

[128] Afrianty, D. 2018. Agents for Change – Local Women's Organizations and Domestic Violence in Institute for Religion, Politics, and Society (RPIS) Vol.17.

Potential interventions: Gender

- Awareness creation of gender equal and inclusive cities among city governments / public servants. Raising awareness of gender stereotypes, and the means by which these are perpetuated is a key method in which social norms and culture may be addressed and in which gender equality may be fostered.
- Focus on extending government services to women in slum settlements and providing mechanisms for meaningful ways in which women may better participate both economically and socially in urban life.
- Proactive monitoring of the implementation of policies and programmes from a gender and social inclusion perspective.
- More and better data. There are gaps in the availability and consistency of data on demographic and socio-economic conditions, including disaggregated data on poverty in Makassar City. Efforts that prioritise collection, analysis and use of disaggregated data is key in informing responsive urban service delivery, understanding trends, and using data to better plan for and meet future demands.
- Gender and inclusion assessment of climate change related risks/impacts and inclusion in urban planning / services that allows women's (and other vulnerable groups) needs, priorities and preferences to be effectively considered.
- Educating the community about domestic violence is important to ensure people understand exactly what constitutes domestic violence. Without proper understanding of the laws, victims are not aware of their rights and they may not be supported by the local community to exercise their rights. In addition, government services that provide support, information, and means to access assistance (including online support) are important on this topic.

7.4.3 Children and youth

Data from the Makassar City Social Service shows that in 2020, there were 8,189 displaced children who could not be accommodated in available orphanages. A 2017 investigative report into urban child poverty and disparity in Indonesia identified that children in urban areas experience poor public facilities, including clean water, public toilets, and playgrounds. Access constraints are primarily around cost barriers to access education and health services. The existence of urban poor children living in illegal settlements is also often not adequately identified by the existing urban development policies, which in consequence has excluded children from attaining sufficient basic services. In Makassar, some of the key issues identified in focus groups with children include a lack of playgrounds or green space in which to play, resulting in children playing in dangerous places such as roads, alleyways, embankments or riversides. Less inclusive education is another challenge, for urban poor children, and particularly those with disabilities.

The population structure of Makassar city is in transition from a young population to a so-called middle population, characterized by a high proportion of youth (10-24) and children groups (0-9) (Table 32). The population of youth is currently just over about 23% of the population of Makassar city, numbering more than 360 thousand people. If children under the age of 10 years are added, then the total reaches 41% of the total population of Makassar City. [129]

[129] BPS South Sulawesi Office, 2015

Table 32: Projected Number of Youth and Children in Makassar, th.2020-2030

AGE GROUP	2020	2025	2030
0 – 9 Year	268,619	253,421	227,112
10 – 24 Years	360,344	377,304	389,935
Total	628,963	630,725	617,047
(% of Total Population)	(41,19%)	(39,12%)	(35,34%)

Data from the Makassar City Social Service shows that in 2020, there were 8,189 displaced children who could not be accommodated in available orphanages.[130] A 2017 investigative report into urban child poverty and disparity in Indonesia[131] identified that children in urban areas experience poor public facilities, including clean water, public toilets, and playgrounds. They also face constraints, such as cost barriers to access education and health services. The existence of urban poor children living in illegal settlements is also often not adequately identified by the existing urban development policies, which in consequence has excluded children from attaining sufficient basic services. Furthermore, economic limitations also force children to work and this exposes them to risky environments. While parents struggle to make ends meet, children are often lacking in supervision and quality care.

In Makassar, the same report, identified some of the key issues identified in focus groups with children to include a lack of playgrounds or green space in which to play, which is a particularly acute problem for the urban poor. Playing in childhood is a critical developmental activity, shaping both cognitive and emotional skills.

The lack of a place to play is a reason that children then play in places that are dangerous, such as roads, alleyways and on embankments or riversides (noted as a particular issue in Makassar).

As eluded to in above sections, less inclusive education is another challenge, for urban poor children, and particularly those with disabilities. A lack of inclusiveness in education experienced by children is attributed local specific policies at the school level, which is heavily influenced by the social norms prevailing in the surrounding communities. For example, in many cases, students becoming pregnant before marriage discontinue their education due to implicit pressure and stigma. Other challenges include quality and relevance of education, the inadequacy of vocational schools, and lack of science teachers.[132] Difficulties in accessing educational and health facilities is also identified as a key issue due to hidden costs, despite the government providing several assistance programs. The examples of hidden costs in education are the costs for transportation, uniforms, books, and the costs for school events.[133]

As noted above, Indonesian youth are increasingly online and connected via mobile devices, with smart phones the primary source of connection. The country has 122 million Facebook users, the fourth-largest audience in the world. It also has one of the largest populations of Instagram users in the region, making Indonesia the largest Instagram story producer in the world. Behind this

[130] Makassar Social Service, 2020.

[131] Bima, L., et al. 2017. Urban Child Poverty and Disparity: The Unheard Voices of Children Living in Poverty in Indonesia. SMERU Research Report. UNICEF.

[132] Goodwin, N., and Martam, I. 2014. Indonesian Youth in the 21st Century. UNFPA. https://indonesia.unfpa.org.

[133] Bima, L., et al. 2017. Urban Child Poverty and Disparity: The Unheard Voices of Children Living in Poverty in Indonesia. SMERU Research Report. UNICEF.

popularity is a young, digitally savvy population. ICT is a crosscutting issue and is rapidly influencing how youth communicate, learn, experience and work. Indonesia needs to harness the educational and economic value of ICT, as well as using youth connectivity to foster enhanced participation and collaboration with government.

Besides broadening the reach of public facilities and infrastructure in urban poor areas, key broadscale interventions should include expanding social protection programs and providing subsidized or free transport (that is more accessible to poor children). Fostering safe public and green spaces, including playgrounds, is another focus area for urban planning related to children and youth. Expanding access to education and particularly vocational (and digitally based) education is an area that is recommended for further intervention. Increasing youth participation and collaboration with government through, for example social media platforms that are already widely used, in order to foster more inclusive and responsive governance that better meets youth needs is another recommended focus area.

Potential interventions: Youth and children

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7.4.4 Older persons

Particularly vulnerable are those older persons in slum settlements in Makassar city, who face the compounding challenges associated with poverty. Mobility and access to facilities and services by older persons is also a current issue that has been exacerbated by COVID-19. The majority of eldercare continues to take the form of informal care provided by the household (mainly women) without support or advice from professional caregivers.

Indonesia is projected to be among the world's top ten countries in terms of the proportion of population aged 80 years and over by 2050. The ADB Social Protection Index indicates that Indonesia spends 2.1% of its aggregate GDP for social protection expenditure. According to the World Social Protection report, only 14.1% of the elderly population receive old age pensions in Indonesia. While 75% who work in the non-formal sector have no old age security at all [134]. Conditional Cash Transfer (CCT) is provided by the government to those aged above 70 years. The government has also implemented a Prosperous Family Card for the older population. Currently there are 150,000 older persons over 70 years who are less able. They receive social assistance amounting to IDR 2,000,000 per year. This program is implemented with the consideration that there is a value-oriented system that should keep parents within their families. [135]

[134] ILO; World Social Protection Report 2017-2019.
[135] 2018; Department of Older Persons, Government of Thailand; Care for Older Persons in ASEAN+3 The Role of Families and Local and National Support Systems.

An increasing number of elderly Indonesians are cared for in institutions, but the majority of eldercare continues to take the form of informal care provided by the household (mainly women) without support or advice from professional caregivers. Different ethnic groups in Indonesia have different expectations about eldercare, but ageing parents are often cared for by a younger daughter in their own home [136]. Elderly people with higher household incomes are less likely to live with their children [137] since they have the resources to pay carers or support poorer relatives who care for them at home. [138]

In Makassar City, the number of older persons within the population is increasing year on year, mainly due to increasing in life expectancy.

The latest population data of Makassar City found the population aged 60 years and above (considered as "elderly population") has reached 9.2% of the total population of Makassar, or approximately 140 thousand people. Key challenges experienced by older persons is the intersection between age and increasing disability. Particularly vulnerable are those older persons in slum settlements in Makassar city, who face the compounding challenges associated with poverty.

A recent study on social interactions and elderly quality of life in Makassar City [139] found the opportunity for older persons to have meaningful social interactions was very limited. Most activities they had been around the neighbourhood and religious activities. Health conditions were found to have a strong relationship with how elderly perceived their quality of life. Their health conditions would affect their mobility, in which would also influence their quality of life. There are a number of programs currently being trialled and implemented targeting older persons in Indonesia, including integrated health services for the elderly (Posyandu Lansia), including health and nutrition counselling and gym services. Makassar is one such city where this program being promoted, involving local government and community to initiate a Posyandu Lansia which is still running today, with positive responses from residents.

Such initiatives are particularly important when recognising the disproportionate impact of COVID-19 on older persons in Indonesia. The proportion of older persons (60 years old and above) accounts for 41% for the COVID-19-related deaths, while their proportion for COVID-19 positive cases is merely 10.9 percent according to the COVID-19 National Task Force data as of 22 September 2020 [140].

[136] Kevane, M & Levine, D. 20003. Changing Status of Daughters in Indonesia. Centre for International and Development Economics Research, Working Paper Series.

[137]

[138] Thomas, D., et al. 2012. Cutting the costs of attrition: Results from the Indonesia Family Life Survey. Journal of Development Economics, Vol. 98 (1), Pages 108 – 123.

[139] Bernard, G. 2018. Social Interactions and Elderly Quality of Life in Makassar, South Sulawesi, Indonesia. IOSR Journal of Humanities and Social Science. Vol. 23 (2).

[140] https://reliefweb.int/report/indonesia/addressing-older-persons-vulnerability-during-covid-19-pandemic

Potential interventions: Older persons

- Planning for an aging population in Makassar City – including expansion of integrated services for older persons that build on existing successful programs. Here too, emphasis should be placed on facilitating access by older persons to services, particularly for those located in slum settlements where age-related vulnerabilities intersect with poverty.
- Incorporating technology in enhancing smart delivery of services to older persons, particularly in providing ongoing and long-term services under COVID-19 conditions. Here, digital / virtual health services, social connection services, and support services for family carers of older persons should be prioritized for future interventions.

7.4.5 Persons with disabilities

A key issue inhibiting access to social protection programs for Persons with Disabilities (PwDs), is data. Data on disability in Indonesia varies in methodology between different institutions and makes it difficult to describe trends or compare datasets across time or different surveys. For the most part, PwDs are invisible within the data. This is most evident in the lack of legal identity for people with disabilities across Indonesia, in particular birth certificates, without which other forms of identification and access to social protection programs and services is severely restricted.

There is limited research undertaken on the issue of PwDs in Makassar Indonesia. However, as the social cultural, economic aspects of disability are similar within Indonesia, a study related to the city of Banjarmasin has been referred to in order provide an indicative overview of common issues. Key issues associated with PwDs include lack of inclusive design in city streets of which has caused vulnerable groups such as children and elderly with disabilities to struggle to access basic facilities such as health facilities, schools, public transportation, and public spaces. Many PwDs in Indonesia hardly leave their homes due to limited mobility. Their situation is exacerbated by the lack of awareness and stigma associated with disability among local communities. For children with disabilities, lack of access to schools, and the increased likelihood of bullying at school are highlighted as key challenges. There is also an acute shortage of qualified teachers and accommodating facilities in inclusive schools. [141]

A Rapid Assessment of the impacts of COVID-19 in Indonesia [142] has found that people with disabilities face barriers in accessing educational information on the COVID-19 outbreak and the government's social safety net programs. Most respondents had also experienced an 80-90% income reduction, either due to losing their jobs or losses in their small home-based businesses.

Potential interventions: Persons with disabilities

- More and better data on PwDs in Makassar to allow for better planning and service delivery to be achieved for PwDs.
- Interventions that focus on digital identification / registration for easier access to government services (health, support, education).

[141] 2019, UNESCO and Kota Kiji, Banjarmasin City: A Disability-Inclusive City Profile.

[142] https://www.newmandala.org/indonesian-disability-activism-amidst-the-covid-19-pandemic/

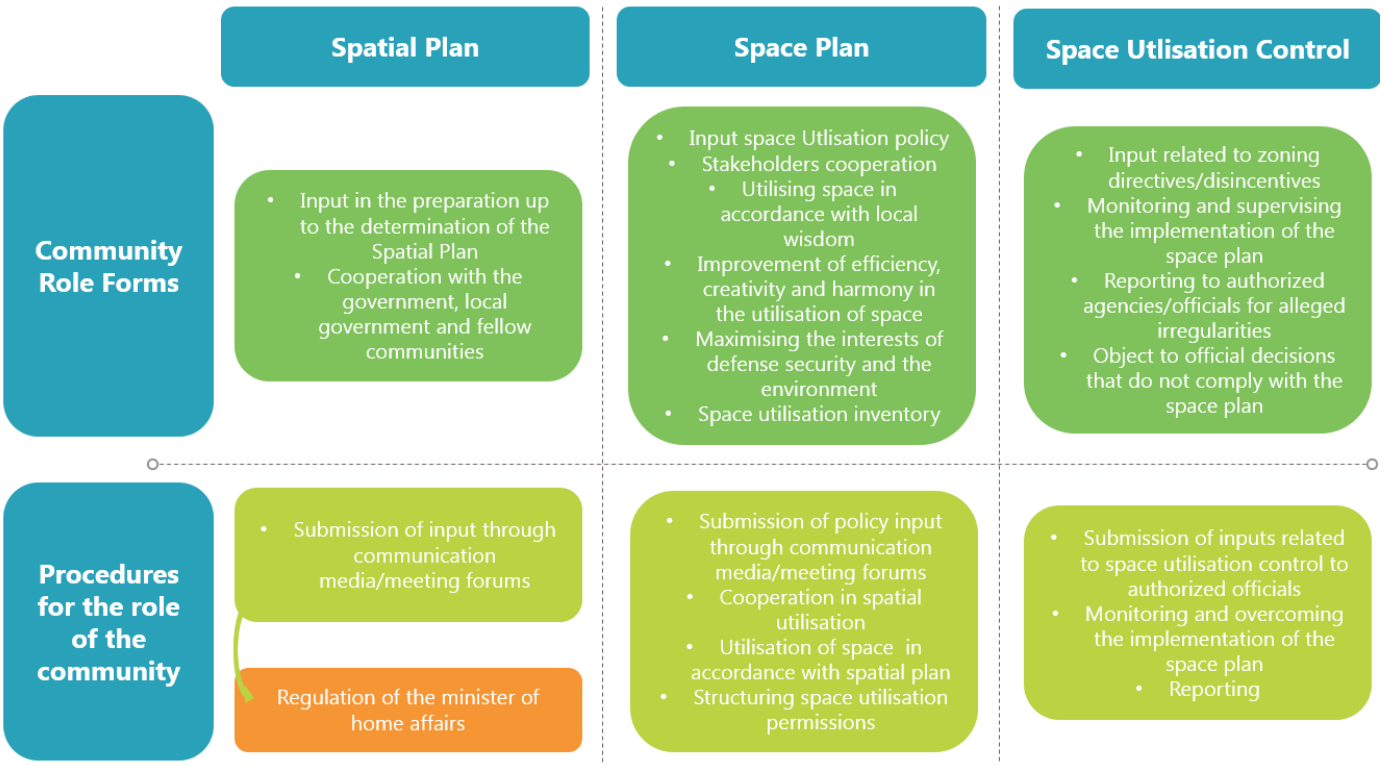
7.5 CITIZEN ENGAGEMENT / COMMUNITY EMPOWERMENT

Law No. 26 of 2007 on spatial planning identifies the importance of community participation in spatial planning. The Law was drafted in a reform period with the spirit of Good Governance - noting that the implementation of spatial planning is carried out by the government by involving the community.

The participation of the community is proposed to be achieved through:

- Participation in the preparation of spatial plan
- Participation in space utilization (land uses)
- Participation in space utilization control.

Figure 58: Community Participation in Spatial Planning



8. CONCLUSIONS AND NEXT STEPS

8.1 KEY FINDINGS

In formulating the Makassar Livable City Plan, key issues raised in the Situation Assessment will be addressed. Some of the key issues include:

Key elements of the approach to developing the Makassar Livable City Plan include

- Integration with the provincial spatial plan
- Integrating Big Data [Note: Presidential Decree 39 of 2019: One Data for Indonesia (Big Data) and Makassar Regulation of Mayor No 22 of 2020]

Figure 59 shows a summary of considerations for the Makassar Livable City Plan identified in this report and identifies some of the broad benefits for the City of Makassar.

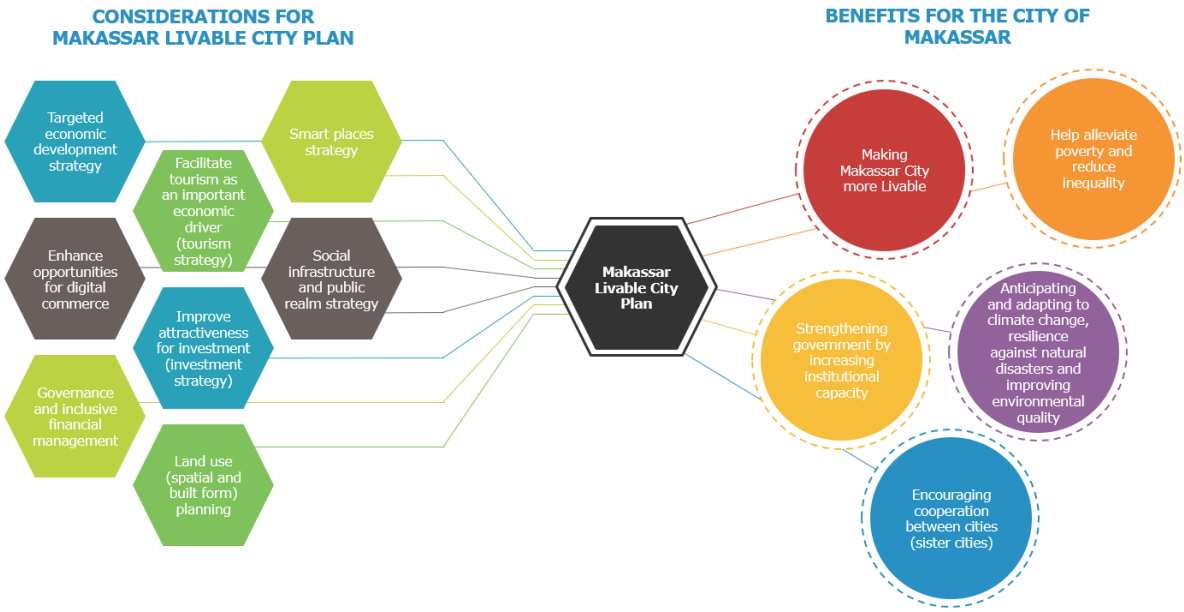


Figure 59 Benefits of the Makassar Livable City Plan

8.2 NEXT STEPS

In order to obtain the desired results, we propose a collaborative approach with institutions at the city level, engaging national and international specialist teams together with smart data analysis and engagement instruments. Our aim is to cooperate with the city government and formulate both the analysis and output required by Makassar. Our intention is to integrate plans for a smart and livable Makassar under a single umbrella strategy. Through this approach, we can strengthen the existing database and create a set of instruments for Makassar city in the future.

SUPPORTING VOLUMES

Volume 1. Urban development
Volume 2. Water and sanitation
Volume 3. Social and GESI
Volume 4. Environment, land management and energy
Volume 5. Urban governance
Volume 6. Financial sustainability and economic development
Volume 7. Tourism
Volume 8. Urban mobility
Volume 9. Smart infrastructure
Volume 10. Climate change and natural hazards

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The ASEAN Australia Smart Cities Trust Fund (AASCTF) assists ASEAN cities in enhancing their planning systems, service delivery, and financial management by developing and testing appropriate digital urban solutions and systems. By working with cities, AASCTF facilitates their transformation to become more livable, resilient, and inclusive, while in the process identifying scalable best and next practices to be replicated across cities in Asia and the Pacific.

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