Kuala Lumpur, Malaysia
1. Overview

Kuala Lumpur is the capital and largest city in Malaysia. It has a GDP of approximately $50bn, contributing 16% of national production. Kuala Lumpur’s main economic outputs include: tourism, finance, electronics manufacturing and construction. The city economy regularly grows 6-7% per year, outpacing the national average of 5% (2011-2018). Kuala Lumpur is home to 1.84m people1, with 7.8m living in the greater urban conurbation.

Kuala Lumpur is located in the Klang Valley Basin in Peninsular Malaysia. The Klang and Gombak Rivers converge in the city centre before flowing through Selangor State and discharging downstream into the Straits of Malacca. Managing flood risk and water pollution are major transboundary challenges for Kuala Lumpur.

The Kuala Lumpur City Hall is responsible for city governance and development. Urban policy priorities include further investment in human capital, the development of public infrastructure (particularly transport and waste infrastructure) and encouraging sustainable economic growth.

Closing the Loop will be working with district and state-level government alongside private and NGO actors to manage plastic pollution and leakage in the Klang River. Present data on plastic pollution is limited so there is considerable scope to further understanding of plastic waste in Kuala Lumpur.

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Figure 1. Kuala Lumpur City, satellite overview.
2. Environment

Location: Central West Coast, Peninsular Malaysia

Area: 243km²

Climate System: Tropical rainforest.

Average Yearly Precipitation: 2486mm (129mm to 286mm).

Natural Resources

Water

Kuala Lumpur is situated in the Klang Valley Basin. The Klang drains 1,342km² and extends 120km through the most urbanised region of Malaysia. Originating in the mountainous Selangor state districts of Gombak and Hulu Langat, the Klang is fed by 10 major tributaries and influences by two large upstream supply dams: Batu Dam and Klang Gates Dam.

Ongoing management challenges include: soil erosion and sedimentation, flooding (averaging 3 major floods per year) and solid waste pollution. Recurring regional water shortages are also a major concern. These result from dry upstream conditions coupled with a high local reliance on river reservoirs for potable water. This led to water rationing in Kuala Lumpur and Selangor in 2014 and 2015.

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Initiatives such as the: River of Life, Selangor Maritime Gateway, One State-One River and the ADB Basin Environmental Improvement and Flood Mitigation Project, focus on addressing these challenges. So far, the Integrated Flood Forecasting and River Monitoring Project in the Klang Valley has greatly increased monitoring capacity and established 88 hydrological stations.

**Forests**

Long term urbanisation trends and palm oil expansion have resulted in widespread deforestation across Peninsular Malaysia. Between 2001 and 2019 Malaysia had one of the world’s highest rates of forest loss for its size, losing 28% of national tree cover. However, in recent years Kuala Lumpur has worked to preserve green space and nature in the city. At present, green cover accounts for 30% of total land area and has several protected nature reserves including the KL Forest Eco Park, Bukit Sungai Besi Reserve and Bukit Sungai Putih Reserve.

**Minerals**

While Kuala Lumpur was first founded in support of the local tin industry, today primary sector production make only a small contribution to the city economy. In the surrounding Selangor Province aggregate, coal and tin mining is more prevalent.

**Climate Change**

Key climate risks to Kuala Lumpur include: increasing urban flood frequency and intensity, and increasing extreme weather events. Additionally rising temperatures will create greater energy demand to cool urban infrastructure. Malaysia’s guiding framework, actions and objectives on climate change are laid out in the 2009 National Policy on Climate change.

3. **Services**

**Waste Management**

National waste solid waste production has rapidly expanded over the last decade. 2020 generation is estimated at 45,900 tonnes/day. Malaysia is also major importer of plastic waste, taking in 870,000 tonnes in 2018. Informal actors are an established section of the SWM value chain in Malaysia, ranging from independent waste pickers and scrap collectors to larger recycling plants. This means a significant proportion of the recycling sector is unregulated and therefore accurate data is difficult to obtain. Due to growing awareness of the scale of the waste challenge facing Malaysia, national policy

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has significantly shifted in recent years. More stringent import conditions and a crackdown on the illegal waste sector meant that by 2019 imports were reduced to only 143,000 tonnes and over 100 illegal plants were shut down. Recent estimates suggest national recycling rates are around 24.6% and 11.4% for plastics (2017). However, though domestic waste segregation has been legally required since 2015 engagement, public awareness is still low.

Waste collection in Kuala Lumpur is overseen by the Department of National Solid Waste Management and the Solid Waste Management and Public Cleansing Corporation (SWCorp). At a local-level city operations are managed by the private Alam Flora Company which complete twice weekly collections. High urban density and growing consumption have produced per capita waste rates of around 1.62kg per person per day, almost double the national average. This is expected to continue to increase, reaching 2.23kg/capita by 2024.

About 95% of collected waste in Kuala Lumpur is sent to the Taman Beringin Transfer Station. This redistributes waste from Kuala Lumpur to sanitary landfills and disposal sites outside the city. The largest of these is Bukit Tagar in Hulu Selangor. This 700ha landfill is situated about 50km to the north and aims to operate until 2045. Because the central transfer station has only 1700ton/day capacity operations here are already under significant pressure. To mitigate this load a 1,200 ton/day waste-to-energy plant near the site has been proposed.

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Key challenges to plastic management include: limited public awareness, low recycling rates, high costs for alternative products, poor local enforcement, and a lack of integrated waste management approaches.

**Total solid waste generation:** 3739 tons/day\(^{13}\)

**% Plastic Waste:** 24\(^{14}\)

**Total Plastic waste generation:** 897 tons/day (calculated)

![Map of Klang Valley Waste Disposal Sites](image)

**Digital Readiness**

Promoting ICT uptake and high-tech business is an important policy goal in Malaysia. As the centre for the country’s digital economy, Kuala Lumpur has developed strong technology infrastructure and high human resource capacity. Over time the government has provided significant incentives for digital development from the formation of the Multimedia Super Corridor (MSC) in 1996 to the Digital Free Trade Zone established in 2017. Kuala Lumpur City Hall aims to be a fully electronic, paperless governing body in line with the Public Sector ICT Strategic Plan 2016-2022.

**National Index Score\(^{15}\):** 14.31/25

**Global Digital Readiness Rank:** 38

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\(^{15}\) Ibid: Cisco, 2019.
Global Networked Readiness Rank\textsuperscript{16}: 32

Water Provision

Kuala Lumpur has a comprehensive and good quality water supply. Urban coverage is >99% and provided by the state-owned Air Selangor utility company. This is primarily sourced and treated from 6 large supply reservoirs located in Selangor State. Despite strong infrastructure, changing climate conditions and increasing drought likelihoods pose a risk to municipal water security.

4. Society

Malaysia is a highly urbanised country (76\%\textsuperscript{17}) and has a total population of 32.7m\textsuperscript{18}. As the capital city, Kuala Lumpur provides social and economic opportunities for around 1.8m people across 461,600 households\textsuperscript{19}. Following national trends, Kuala Lumpur’s population has begun to plateau, with growth rates slowing from +2.4% in 2015 to -0.2% in 2018\textsuperscript{20}. Despite slowing population growth, long-term urbanisation patterns are expected to continue and reach 90% urban residency by 2050. Additionally, growth is still expected in the wider conurbation which is seeing faster annual changes (4-6\%) than the city proper. This has led to expansive unplanned sprawl through the surrounding Selangor State and generated significant mobility and infrastructure challenges. Urban planning priorities in Kuala Lumpur include developing public transit infrastructure, the provision of affordable housing, and strengthening pollution and waste management.

Kuala Lumpur’s economy is a strong draw for internal and external migrants. As such, the city has developed a diverse multi-lingual and multi-ethnic culture. Malay, Chinese and Indian groups make up the urban majority with additional representation from Kadazans, Iban and other indigenous groups. Despite transformative social and economic change over the last few decades Kuala Lumpur remains a melting pot for the old and new of Malaysia. This creates a unique urban identity allowing the ancient Batu Caves to coexist with towering skyscrapers such as the Petronas Twin Towers.

City Population: 1.824m\textsuperscript{21} (KL Federal Territory); 7.78m (Greater Kuala Lumpur).

Population density: 7506 people/km\textsuperscript{2} (calculated)

Kuala Lumpur Human Development Index: 0.86\textsuperscript{22} (0.804 national)

\textsuperscript{17} Ibid: UN, 2018
\textsuperscript{20} Department of Statistics Malaysia, 2018. Kuala Lumpur @ a Glance https://www.dosm.gov.my
\textsuperscript{21} Ibid: UN Data, 2019
\textsuperscript{22} Global Data Lab, 2020. Subnational Human Development Index: Malaysia https://globaldatalab/shdi
5. Economy

National

Malaysia is the third largest economy in ASEAN and has experienced average annual growth of 5.4% since 2010\textsuperscript{23}. It is classified as an upper middle-income economy and has large a manufacturing sector, particularly for electronics, as well as tourism, finance and oil and gas. It is also the second largest producer of palm oil in ASEAN, producing 98.4m tonnes in 2019. By 2030 Malaysia aims to restructure its low-skill, labour-intensive economy into a knowledge-based economy. Improving human capital, through social policy, improving education and technological capacity, and tackling income inequality are high priorities\textsuperscript{24}.

Due to a heavy dependence on exports Malaysia is particularly vulnerable to the economic shocks of COVID-19. This has been compounded by a global drop in oil prices. In the first quarter of 2020 economic growth had slowed to 0.7% down from 4.5% over the same period in 2019. The relative wealth of Malaysia has allowed for creation of large stimulus packages and therefore economic growth is expected to rebound strongly to 9% in 2021\textsuperscript{25}. Foreign direct investment declined in 2018 driven by reduced quarrying and mining activity, however overall investment remains high, averaging $36.4bn 2010 – 2019. The World Bank ranked Malaysia as 12\textsuperscript{th} in its annual ease of doing business report in 2019.

GDP: $358.582bn\textsuperscript{26}

GDP per capita: $11,373

Economy by Sector\textsuperscript{27}: Agriculture - 7.1%  Industry/Construction – 34.1%  Services – 57.7%

City

Kuala Lumpur is the wealthiest state in Malaysia and accounts for 16% of GDP. Economic growth averages 6-7% per year and per capita GDP is more than double the national average. In 2018 the largest growth rates were found in the construction (6.8%) and service (7.3%) sectors\textsuperscript{28}. The city is a regional financial centre and specialises in Islamic finance. This totalled $224bn in banking assets in 2018, the largest in the world. The wider Klang Valley is heavily reliant on Kuala Lumpur’s economic output. Kuala Lumpur is also a major tourist destination and ranked in the top 10 most visited cities in the world\textsuperscript{29}. Additionally the integration of the Greater Kuala Lumpur region with China’s maritime Belt and Road Initiative suggests sustained investment in infrastructure and connectivity in future.

GDP: $50bn

GDP per capita: $27,845 (2018)\textsuperscript{30}

\textsuperscript{29} Euromonitor International, 2019 Top 100 City Destinations Report https://go.euromonitor.com/white-paper-travel-2019-100-cities.html
\textsuperscript{30} Ibid: Department of Statistics Malaysia, 2018.
6. Governance

National

Malaysia is structured into 11 states and 2 federal territories. The urban centre of Kuala Lumpur is classed as a federal territory and managed under the jurisdiction of the Federal Territories Ministry of Malaysia. Malaysia is governed as a representative democracy with state governments established under their respective state constitutions. Policy is developed and implemented through a three-tier structure of federal, state and local authorities.

City

Kuala Lumpur Federal Territory is directly administered by Kuala Lumpur City Hall. This is composed of 24 departments and plays a central role in decision-making and development planning. Departments are organised along four main themes: planning, management, socio-economic development and project management. Kuala Lumpur City Hall is responsible for implementing physical and socioeconomic development programmes, city planning and management and the provision of basic urban services. This is framed through the Kuala Lumpur Strategic Plan 2020 which outlines finance, industry, tourism and trade objectives. At a local level Kuala Lumpur is managed as 11 districts under the central authority of the City Hall.
Transboundary Considerations

Urban planning interventions will be complicated by the transboundary nature of both the Klang River and the Greater Kuala Lumpur urban conurbation. Upstream water degradation and solid waste leakage pose risks to both Kuala Lumpur city and other downstream settlements including Shah Alam, Klang City and Port Klang. Additionally, the Greater Kuala Lumpur urban area intersects with 3 districts and 11 mukims (municipalities) in the State of Selangor. Coordination with Gombak District will be particularly important.

Due to its length the Klang River is similarly transboundary. It intersects seven local authorities and as such any actions to address solid waste must consider up and downstream stakeholders. Particularly important are the differing development trajectories and objectives observed between Kuala Lumpur and the encircling State of Selangor. Effective communication and coordination of institutional partners will be required to mitigate any disconnect between pollution stakeholders along any plastic leakage pathways. Since 2003 under the designated River Basin Management Units have been required to produce multiyear basin master plans31.

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7. Key Plans, Policy and Regulations

Urban Development

_Eleventh Malaysia Plan 2016-2020._
Defines national targets up to 2020. Aims to improve productivity, innovation and quality of life in Malaysia. Its successor the 2021-2025 plan is currently undergoing review in wake of Covid-19.

_Kuala Lumpur Structure Plan 2020._
Approved in 2004, this presents Kuala Lumpur’s urban development objectives by 2020. This aimed to: enhance international commerce and finance, develop an efficient and equitable urban structure, improve the living environment, establish a unique urban identify, and implement effective city governance.

_Kuala Lumpur City Plan 2040._
An updated plan for the 2020-2040 period currently in the draft stage. This plan presents development targets across six themes: economic sustainability, inclusive community, city greening beautification, low carbon city, efficient mobility, and integrated land management.

_Kuala Lumpur Drainage Masterplan._
Addresses river engineering, flood risk and pollution management for Kuala Lumpur’s waterways. Includes provision of 1,000 gross pollutant traps, 74km of new drainage, 11 pumping stations, 71 storage ponds and a 3.9km flood wall.

_Strategic Plan for Solid Waste Management (NSP) 2005._
Adopted in 2005 and provides the foundation for further solid waste legislation. Aims for 22% waste reduction and recovery, and 100% urban waste segregation by 2020.

_Master Plan on National Waste Minimization 2006._
Provides policy suggestions, federal and local action plans and establishes guidelines for waste minimisation.

_National Solid Waste Management Policy 2006._
Developed to facilitate the development of an integrated solid waste management (ISWM) system in Malaysia.

Mandates solid waste regulations and management practices. Adopted alongside the *Solid Waste and Public Cleansing Management Corporation Act* which mandated the establishment of a national Solid Waste Corporation (SWCorp).

**Solid Waste Corporation Strategic Plan. 2014-2020.**

Outlines SWCorp’s policies and action plans adopted in accordance to their legal obligations. Has provisions for environmental, financial and management targets and expansion.

**Environment**

*Environmental Quality Act 1974.*

This act makes provision for the prevention, abatement and control of pollution for the enhancement of the environment in Malaysia.


Presents national objectives, principles and ‘green strategies’ to guide environmental and natural resource management. Created the framework for environmental policy development and priorities to 2020.

*Malaysia Roadmap Towards Zero Single Use Plastics 2018-2030*

A three-phased national plan to eliminate single-use plastics. Currently in Phase 1 aiming to develop a legal and governance framework, implement a pollution charge, establish communication, education and public awareness programs and improve stakeholder capacity. A supporting Circular Economy Roadmap (CER) is set to be introduced by the Ministry of Water and Environment in 2020.

*Malaysia National Cleanliness Policy 2019*

Beginning in 2020 this plan defines 14 strategies and 91 action plans to address national cleanliness and waste to 2030. Actions are defined across 5 policy clusters: awareness of cleanliness, environmental sustainability, circular economy, governance and enforcement, human capital development.

**Sustainable Development Goals**

Though Malaysia lacks a dedicated SDG action plan, the principles and targets of the Eleventh Malaysia Plan and the 2010 New Economic Model. Progress towards the SDGs is assessed under the National SDG Council and the SDG Steering Committee, headed by the Economic Planning Unit. Individual development goals are then allocated between 5 working committees under the themes of:
Inclusivity, Well-being, Human Capital, Environment and Natural Resources, and Economic Growth. These committees are composed of members from the public, private, NGO, CSO and academic sectors.

**SDG 11.6:** Reduce the Adverse environmental impacts on people in urban areas, including by strengthening management of air quality, urban waste and other sources of waste.

Lead agency: Working Committee for Well-being.

**SDG12.5:** By 2030, substantially reduce waste generation and increase the economic value of water resources through prevention, reduction, recycling, reuse, and recover of energies from waste treatment.

Lead agency: Working Committee for Environment and Natural Resources.

**SDG14.1:** By 2030, prevent, significantly reduce and successfully control marine pollution of various forms, particularly pollution from land-based activities, including solid waste, waste water and organic substances pollution.

Lead agency: Working Committee for Environment and Natural Resources.

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**Figure 12.** Agenda 2030 and the 11th Malaysia Plan. Source: EPU, 2019
8. Key Stakeholders

Governing Institutions

Kuala Lumpur City Hall

Department of Health and Environment
Department of Public and Drainage Engineering.
Department of Landscaping and Recreation Development
Department of City Planning
Department of Infrastructure Planning

Ministry of Science, Technology and Innovation
Malaysia Green Technology and Climate Change Centre

Ministry of Environment and Water.
Department of Environment
Department of Irrigation and Drainage

Ministry of Housing and Local Government
National Water Resources Council

International Projects and Donors

WWF - Extended Producer Responsibility Project (regional)

Private Sector

Malaysia Plastics Pact

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