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Penang's Progress towards the Sustainable Development Goals by 2030

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EXECUTIVE SUMMARY

- According to the Jeffrey Sachs Center's score measurement, Penang achieved a score of 64.2 for its overall SDG performance in 2021.

- The state has attained goals for SDG 7 (Affordable and Clean Energy) and SDG 9 (Industry, Innovation and Infrastructure), and will be maintaining these achievements till 2030.

- Major challenges remain in achieving SDG 2 (Zero Hunger), SDG 11 (Sustainable Cities and Communities) and SDG 15 (Life on Land).

- In order to accelerate SDGs progress, a multi-stakeholder approach is needed to leverage the inter-linkages between the SDGs, and to improve their effectiveness.

- Crucial SDG data are still lacking at state level, and since high-quality statistics are key for measuring and monitoring SDGs progress, improving and strengthening statistics for SDGs at that level remains an essential undertaking.

- A medium-to-long-term approach is needed to guide sustainable development policies, with special focus on the indicators where the state faces major challenges.

1. Introduction

The Sustainable Development Goals (SDGs) are a set of goals listed under the 2030 Agenda for Sustainable Development (2030 Agenda), which is a global development framework set in 2015 by the United Nation (UN) member states. It consists of 17 SDGs with 169 targets, and there are currently 248 indicators to measure progress towards reaching the targets.

In 2015, Malaysia together with 192 member states of the UN pledged to achieve SDGs by 2030. The Department of Statistics Malaysia (DOSM) was officially appointed to coordinate the SDG data collection. Quality data and clear metrics are important to take stock of where the country stands, develop pathways to attain the SDGs, and track progress. In 2019, DOSM launched the National SDG Progress Monitoring System (SDG Dashboard) for disseminating and sharing SDG data. Currently, about 71% of SDG indicators are available for Malaysia.

In 2022, Jeffrey Sachs Center (Sunway University) launched an interactive dashboard to monitor the performance of the SDGs at national and state level. The official UN SDG Indicator List and Sustainable Development Report SDG Indicator List were applied for the selection of indicators and for the assessment. As many as 76 quantitative indicators were chosen for state SDG assessment; this selection was mainly based on the availability of data and relevance for states.

The aim of this paper is to highlight Penang's progress towards attaining the SDGs and the challenges it faces. It also identifies areas that require special attention. The assessment of indicators presented in this paper is based on the Jeffrey Sachs Center's SDG scores, ratings and trends for Malaysian states (SDG for Malaysian states, 2022), as well as DOSM's SDG-related data.

2. Performance and Challenges

According to the Jeffrey Sachs Center's score measurement, Penang achieved a score of 64.2[1] for its overall SDG performance in 2021–below the national score (66.8). The state is ranked 8th in the country, after Kuala Lumpur, Putrajaya, Labuan, Negri Sembilan, Pahang, Sarawak, and Selangor, for its SDG performance (Figure 1). Of 15 SDGs[2], Penang has achieved goals for SDG 7 (Affordable and Clean Energy) and SDG 9 (Industry, Innovation and Infrastructure), and will be maintaining these achievements by 2030. However, the state faces significant challenges to attain most of the SDGs by 2030 (Figure 2), especially SDG 2 (Zero Hunger), SDG 11 (Sustainable Cities and Communities) and SDG 15 (Life on Land). The following is the detailed assessment of SDGs and their related indicators for Penang.

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[1] Scores are marked out of 100. A score of 100 indicates best performance and a score of 0 shows worst performance.
[2] Scores for Goal 12 and 13 are not available for states due to data limitations.
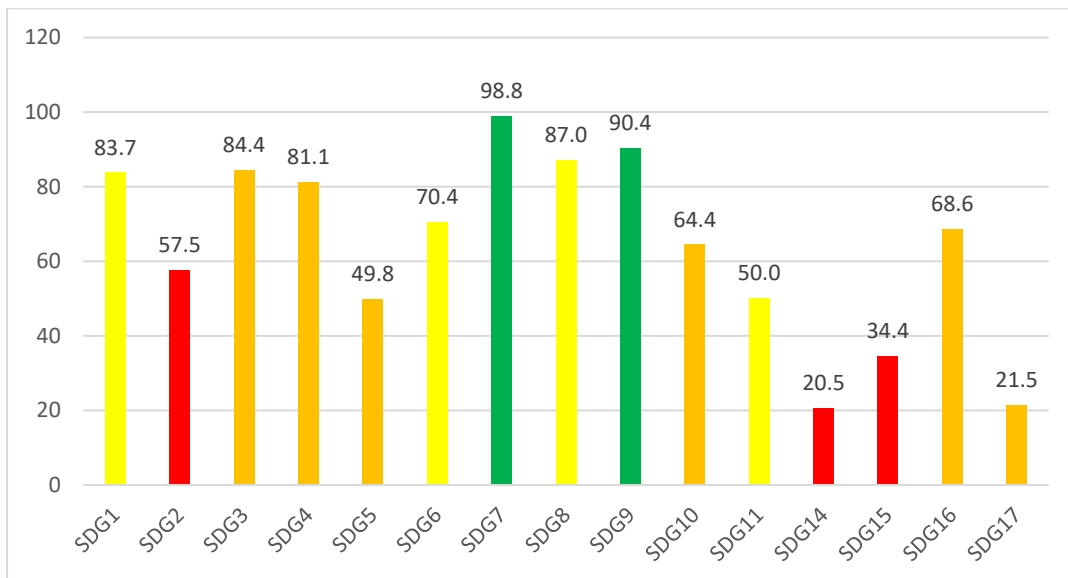
Figure 1: Overall SDG scores by state, 2021
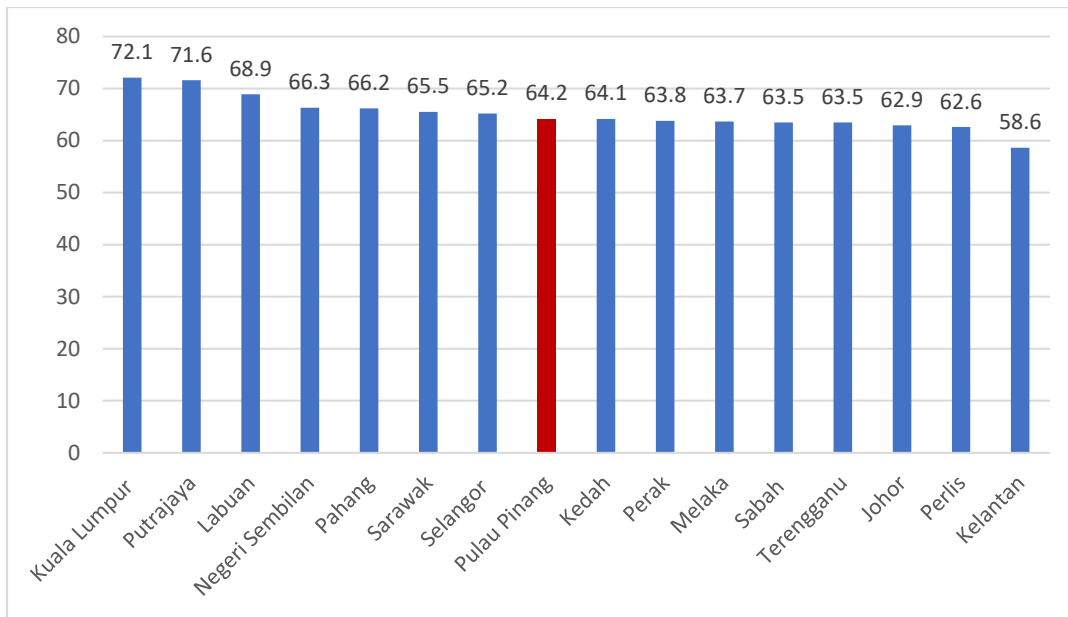
Source: Jeffrey Sachs Center on Sustainable Development, Sunway University
Note: Scores are marked out of 100, where 100 indicates best performance and 0 shows worst performance.

Figure 2: Penang's SDG Index score, 2021

Source: Jeffrey Sachs Center on Sustainable Development, Sunway University
Note: a) Green: SDG Achieved; Yellow: Challenges Remain; Orange: Significant Challenges Remain; Red: Major Challenges Remain.
b) Scores for Goal 12 and 13 are not available due to data limitations.
c) Scores are marked out of 100, where 100 indicates best performance and 0 shows worst performance.

Sustainable Development Goal 1: No Poverty

SDG 1 aims to eradicate extreme poverty by 2030 (UN DESA, n.d.). Based on data availability and relevance of indicators in relation to the state, three indicators were selected, namely the proportion of population below the international poverty line, the proportion of population living below the national poverty line (absolute poverty and relative poverty), and urban and rural relative poverty gap.

The international poverty level is US$ 2.15 per person per day (UNDP, 2023). The latest data by DOSM shows that there is no one living below this level in Penang. It means that the state has achieved the target for this indicator. Yet, at the national level, about 3.3% of Penangites are living below the national poverty line of RM 2,208 per month. Penang has largely reduced absolute poverty, and only 2% of the population lived in absolute poverty in 2022. The state is among the four best performers in the country, after Kuala Lumpur, Labuan and Selangor. However, addressing relative poverty is the state's main challenge for SDG 1. Based on the Household Income and Basic Amenities Survey by DOSM, the incidence of relative poverty in Penang increased from 11.3% in 2016 to 13.2% in 2019 and 15.3% in 2022. This is associated with the increase in inflation and the cost of living. According to the household income survey report 2022, relative poverty refers to "the measurement approach of which the household income is compared with a certain standard of living determined by the society". Its threshold is defined as half of the median income of all households in that specific year, and depends on the current distribution of household income. It means that relatively poor households do have some money, but, not sufficient to afford anything above the basics. Hence, relative poverty shows the percentage of the population that has been relatively left behind. In such cases, more focus on social protection policies and programmes is called for.

In terms of the urban and rural relative poverty gap, Penang is progressing relatively well with a urban-rural poverty gap of 4% in 2019. Investing in rural development such as improving rural infrastructure, developing human capital skills, as well as creating high income and more attractive job opportunities in rural areas, might help reduce that gap.

The overall SDG 1 score for Penang is 84–fifth in the country after Pahang, Kuala Lumpur, Putrajaya and Perlis. Even though the state's performance is moderately improving towards hitting the zero poverty target, challenges remain to achieve this goal by 2030.[3]

Sustainable Development Goal 2: Zero Hunger

Global demand for food is mainly as a result of population growth. Factors that make it challenging to produce enough food and keep up with demand include climate change, urbanisation, low level of investment in food and agriculture, and geopolitical tensions. Malaysia is a net importer which makes the country vulnerable to fluctuations in food supply and prices. In the Global Food Security Index (GFSI) by The Economist Intelligence Unit (EIU) from 2022, Malaysia was ranked 41st out of 113 countries in the world, and second (after Singapore) in Southeast Asia (GFSI, 2022). Malaysia performed moderately in ensuring that its people have access to enough amounts of affordable, safe and quality food.

SDG 2 aims at creating by 2030 a world free of hunger, improving nutrition, achieving food security and promoting sustainable agriculture (UN DESA, n.d.). Malnutrition among children, particularly stunting, is one of the main food security issues in Malaysia. In 2019, 20.7% of children in Malaysia under the age of 5 suffered from stunting and 11.5% from wasting, and 12.7% of children (5-19 years

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[3] To find out more about the scores, trends, ratings and thresholds for each indicator, please refer to "SDG for Malaysian states. (2022). SDGs for Malaysian States. Jeffrey Sachs Center (Sunway University). Available from: https://sdg-for-malaysian-states-sdsn.hub.arcgis.com/"

old) were obese (UNICEF, 2019). Hence, the SDG assessment mainly focuses on Target 2.2 which is "end all forms of malnutrition".

Based on data availability and relevance, two indicators, namely the prevalence of stunting and malnutrition (with a focus on wasting) among children under 5 years of age, are included in the assessment. The overall SDG 2 score for Penang is 57.5–6th in the country after Sabah, Kuala Lumpur, Labuan, Melaka and Selangor. Like the majority of states in Malaysia, Penang is identified as facing major challenges in achieving "Zero Hunger" goal and the progress has been stagnating. Penang's major challenges for this goal lie in its performance for reducing stunting and wasting among children. According to the National Health and Morbidity Survey 2016, stunting and wasting issues in Penang were recorded at 20.3% and 11%, respectively (MHM, 2016).

Malnutrition is one of the barriers to sustainable development; it might result in less productive individuals who are more prone to disease and therefore often unable to enhance their livelihoods. A fundamental shift in trajectory is needed to achieve the 2030 nutrition targets.

Sustainable Development Goal 3: Good Health and Well-Being

Goal 3 seeks to ensure healthy lives and promote well-being for all ages (UN DESA, n.d.). The assessment focuses on 13 indicators. These are the proportion of births attended by skilled health personnel, doctor density per 1,000 population. Hepatitis B notification rate, number of HIV cases, life expectancy, incidence of Malaria, incidence of Tuberculosis, prevalence of tobacco use, mortality rate, maternal mortality ratio, neonatal mortality ratio, road traffic death ratio, and adolescent birth rate.

Overall, ratings show that Penang, with a score of 84.4 faces significant challenges to attain targets for SDG 3. The state achieved the fourth highest score after Putrajaya, Kuala Lumpur and Melaka. Of all indicators, Penang has achieved the targets for having low maternal mortality ratio (29.8 per 100,000 live births), neonatal mortality rates (3.9 deaths per 1,000 live births), mortality rate of children under 5 years old (6.4 per 1,000 live births), adolescent fertility (5 births per 1,000 women), number of HIV cases (0.16 per 1,000 population), and Hepatitis B notification rate (6.6 per 100,000 population), as well as zero cases of malaria.[4] Penang has also attained the desired targets for doctor density (2.1 per 1,000 population) and the proportion of births attended by skilled health personnel (99.9%).[4] It is expected that the state will be retaining these achievements until 2030. In fact, great strides have been made in improving Malaysians' health in recent years. Most Malaysian states have already met or are on track to meet the targets of these indicators.

Penang's major challenge for this Goal is traffic accident death rates. Malaysia has the third-highest number of road deaths (22.5 per 100,000 people) in Southeast Asia (WHO, 2019). The majority of states in Malaysia face major challenges in achieving this indicator's goal. In 2019, the traffic death rate in Penang was recorded at 22.2 deaths per 100,000 population–the second worse performance after Perlis. The traffic death rate increased to 24.6 death per 100,000 population in 2022[4] – an increase of about 11%. Despite the implementation of many road safety initiatives in Malaysia and Penang, the traffic accident and road fatalities remain high. If the target is to be achieved, the effectiveness of the existing strategic plans and road safety programmes need to be re-evaluated.

Sustainable Development Goal 4: Quality Education

Quality education is important for achieving many of the SDGs. For instance, quality education provides opportunities for better jobs, reduces inequality, helps gender equality, and enhances awareness about healthy food and well-being. The main objective of SDG 4 is to ensure inclusive and quality education for all (UN DESA, n.d.). Among the available and relevant indicators are competencies for

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[4] Source: Department of Statistics Malaysia, 2019.

information and communications technology (ICT) skills, literacy skills for young adults, computer access in schools, mathematical proficiency, and supply of qualified teachers.

One of the important indicators to achieve the SDG 4 is proficiency in ICT skills. Today, digital literacy is an essential skill for everyone, particularly in the work place. For example, basic ICT skills such as word processing and using formulas in spreadsheet have become absolutely necessary for many careers and employments. The assessment of competencies for ICT skills has mainly focused on the competency of adults and youths using basic arithmetic formulas in spreadsheet. In 2019, about 48.1% of youth (threshold: 40%) and 36.6% of adults[4] (threshold: 38%) in Penang had basic arithmetic formulas in spreadsheet skills. This indicates that the state has not fully achieved the desirable outcome for this indicator yet. Although Penang has only met the target for youth, it is on track to achieve the target for adults by 2030. A lack of basic computer skills in adults might hinder computerisation of the jobs of older people, and decrease the value of their existing skills. Therefore, training and developing ICT skills (reskilling and/or upskilling) are vital throughout the work life.

Despite achieving the targets for literacy skills for young adults, computer access in schools, and supply of qualified teachers, the state faces major challenges to attain the target for mathematical proficiency for lower secondary school. In 2019, only 58.9%[4] of children and young people at the end of lower secondary had acquired minimum proficiency in mathematics. This is far off the desirable level (85%) for achieving the SDG target.

In spite of significant challenges, the state remains on track to attain the SDG 4 targets by 2030. Overall, Penang obtained the fourth highest score (81.1) in SDG 4, after Putrajaya, Kuala Lumpur and Selangor.

Sustainable Development Goal 5: Gender Equality

The main objective of Goal 5 is to achieve gender equality and empower all women and girls to reach their full potential (UN DESA, n.d.). This would need eliminating all forms of discrimination and violence against them. Women and girls represent almost half of the state's population and therefore half of its potential. Although there has been progress over the past decades, Penang is not on track to achieve gender equality by 2030. Overall, Penang achieved a score of 49.8 for SDG 5–below the national score of 53.7. The state is ranked 8th in the country for its performance in SDG 5, after Kuala Lumpur, Putrajaya, Selangor, Sabah, Perlis, Pahang and Labuan.

With data availability and the relevance of indicators to the state, five indicators have been chosen for the assessment. These are women representation in the State Legislative Assemblies (DUN), proportion of women in managerial positions, mobile phone ownership gap, gender wage gap, and labour force participation rate. Penang's major challenge for SDG 5 is women political representation in DUN. In 2019, women DUN representation in Penang was recorded at 15%–fourth in the country after Perlis, Selangor and Johor. The electoral system (i.e. first past the post (FPTP)), as well as structural challenges and obstacles (e.g. conservative views of political parties) are among the main reasons for the low representation of women in DUN across the country (Chacko, 2021).

In 2019, women were represented in 28.2 % of managerial positions in Penang–the highest in the country. This number dropped to 20.9% in 2022.[5] Since the desired level is 40%, huge challenges remain for Penang to attain this goal by 2030.

Women's empowerment helps women make choices and become active members of a community. Technology, such as mobile devices, computers and the internet, has advanced women participation in the formal economy, production and services sector, scientific field, among others (Niroo and Crompton, 2022). The gender gap in mobile ownership in Penang dropped from 2.9% in 2019 to 1.2%

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[5] See Footnote 4.

in 2022[5] (the desired value is 0.6%). This means that the state is making progress in achieving the indicator target.

In terms of gender wage gap, female employees in Penang received approximately 89% of the male median wage in 2019.[5] The gap is mostly because of non-discriminatory factors such as labour market structure. Additionally, women are more likely than men to work part-time and to take time out from their careers, mainly for family reasons (Vaghefi, 2018). Be that as it may, the state is on track to achieve the indicator target and close the gender wage gap by 2030.

Additionally, Penang faces challenges in achieving optimum value of female to male labour force participation rate. In 2019, the ratio of female to male labour force participation in Penang was 67.2% (threshold: 70%)[5]. Penang is classified as a state with remaining challenges in addressing this target.

Sustainable Development Goal 6: Clean Water and Sanitation

Access to clean water, sanitation and hygiene is one of the most basic human need. SDG 6 aims to ensure availability and accessibility to water and sanitation for all (UN DESA, n.d.). It also addresses issues related to the quality and sustainability of water resources. Improvements in quality of water and sanitation are important for progress in other SDGs, such as no poverty, nutrition, education, good health and life below water.

Three indicators, namely safe drinking water, safe sanitation and ambient water quality, were chosen for the assessment. Penang's overall SDG 6 score is 70.3 – the second lowest in the country after Johor. The state's major challenge in achieving SDG 6 is in its ability to maintain its river basins at good ambience. In 2019, the proportion of river basins in Penang that had good water ambience was recorded at 63% (desired value is 99.2%).[6] Population growth and rapid urbanisation can result in greater levels of water pollution. Rapid development has in fact produced significant amounts of wastes, including domestic, industrial, and commercial, which mostly end up in bodies of water. This has become an important challenge for the government in maintaining clean and good quality water.

About 100% of population in Penang are using safely managed drinking water and sanitation services. This indicates that the state has achieved the targets for safe drinking water and safe sanitation indicators. [6]

Sustainable Development Goal 7: Affordable and Clean Energy

Goal 7 is about ensuring access to affordable, reliable, and sustainable energy for all (UN DESA, n.d.). This is essential to the development of business, education, communications, healthcare, agriculture, infrastructure, and transportation. Based on relevant and available data, SDG 7 focuses on two indicators, namely proportion of population with access to electricity and proportion of population with access to clean cooking fuels and technologies. Penang has achieved the goals for both indicators[7] and is expected to maintain these achievements by 2030. The state obtained an overall score of 98.8 for SDG 7.

Fossil fuels (coal, natural gas, and oil) accounted for nearly 80% of Malaysia electricity generation in 2022 (Statista, 2023). Yet, burning fossil fuels produces a great amount of greenhouse gases which results in climate change, as well as having a harmful effect on human health. In addition, as the population increases and the country develops, the demand for electricity will rise. Hence, a stable and sustainable electricity supply is needed to meet future demand.

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[6] See Footnote 4.
[7] According to DOSM, in 2022, 100% of population in Penang had access to electricity, and 98.3% of household had access to gas/cooking stove.

The energy system is also vulnerable to the impact of climate change such as rising temperature, heat waves, extreme events (e.g. drought and flood) and sea level rise. Therefore, it is important to increase the resiliency of the energy system to climate change by, for example, upgrading and protecting the energy infrastructure from extreme weather, and installing innovative and renewable technologies. These actions not only help address vulnerabilities to the energy system, but also minimise the emissions. To ensure access to energy for all by 2030, there is a need to increase investments in renewable energy, enhance energy efficiency, and develop enabling policies and regulatory frameworks.

Sustainable Development Goal 8: Decent Work and Economic Growth

The main objective of SDG 8 is to promote inclusive and sustainable economic growth, employment and decent work for all (UN DESA, n.d.). The assessment mainly focuses on three indicators, namely annual real GDP per capita growth rate, informal employment, and unemployment rate.

In terms of the indicator pf annual real GDP per capita, in 2022, Penang recorded real GDP per capita[8] of RM 64, 406.9 (at constant 2015 prices). Its annual growth rate has significantly increased from 3.4% in 2019 to 13.1% in 2022.[9] It indicates that the state had already achieved the target for this indicator in 2022 (desired value is 4.6%). Yet, maintaining the optimum level till 2030 is crucial.

Unemployment rate is an indicator that provides valuable insights into the economy's overall development and growth performance. In 2019, the unemployment rate in Penang was recorded at 2% and it slightly increased to 2.7% in 2022.[9] Penang has attained the unemployment rate indicator targets and is expected to maintain them until 2030. Informal employment, which is work that is legal but not declared to the authorities, plays an important role in the country's economy. Undeclared economic activities and negative economic and social effects of informality would result in economic loss. Moreover, workers in informal employment are not protected under labour legislation and social protection. In fact, informal employment is a main challenge for attaining workers' rights and decent working conditions. It also has a negative impact on enterprises, public revenues, as well as competition. Penang has done well in keeping the informal employment rate low for both men (5.9%) and female (5.6%). The state has achieved the indicator target in 2019 and is expected to maintain it by 2030.

Overall, Penang attained a score of 86.95 for SDG 8, ranking it fifth in the country, after Putrajaya, Selangor, Kuala Lumpur and Negri Sembilan.

Sustainable Development Goal 9: Industry, Innovation and Infrastructure

SDG 9 seeks to promote inclusive and sustainable industrialisation, build resilient infrastructure, and foster innovation (UN DESA, n.d.). SDG 9 focuses on five indicators, namely population covered by mobile technology, manufacturing value added as a proportion of GDP, manufacturing employment as a proportion of total employment, mobile-cellular telephone penetration rate, and higher education universities ranking.

Being one of the highly industrialised states and a main hub for manufacturing and industrial activities in the country, Penang has performed well in SDG 9. In 2019, the manufacturing sector contributed 42.8% to the state's total GDP. The share of the manufacturing sector to total GDP increased significantly to 48.3% in 2022.[9]

Manufacturing employment is another important indicator to assess progress towards SDG 9. The share of manufacturing in total employment in Penang increased from 32.9% in 2016 to 36.1% in 2019. However, its percentage share dropped to 34.8% in 2022.[9] The state has attained the desired value for this indicator (threshold: 20.9%), and is expected to maintain it till 2030.

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[8] Real GDP per capita is calculated by dividing the state's GDP at constant prices by its total population.
[9] See Footnote 4.

In terms of access to internet and digital infrastructure, a vast majority (95.2%) of the population in Penang used internet (on any device) in 2019. The state in fact made remarkable strides in overall improvement from 76.9% in 2016. As for mobile-cellular telephone penetration, Penang has shown a significant increase of about 58.7%, from 89 subscribers in 2015 to 141.2 subscribers per 100 inhabitants in 2019.[10]

The Times Higher Education Impact Rankings are the global performance tables that assess universities against the SDGs. In 2021, Penang's universities (top 3 universities) were ranked 33.3 which is above the threshold (30)–an increase of 44.3% compared to 2017.

The state has achieved the targets for all relevant SDG 9 indicators. Among all states, Penang is ranked the best performer in SDG 9 in the country, with a score of 90.4.

Sustainable Development Goal 10: Reduced Inequalities

Rising inequality has emerged as a major public policy concern in recent decades. Inequality not only adversely affects economic development but also damages society and threatens security and peace. SDG 10 is about reducing inequalities within and among countries (UN DESA, n.d.). The assessment focuses on two main indicators–income growth inequality and Gini coefficient.

Gini coefficient is a popular measure of income inequality which indicates the distribution of income across a population. Basically, a higher Gini coefficient shows greater inequality. Penang's Gini coefficient increased slightly from 0.356 in 2016 to 0.359 in 2019 and then climbed to 0.371 in 2022.[10] It indicates a higher income inequality in 2022. Penang has significant challenges in meeting the target for this indicator by 2030.

Income growth gaps between bottom 40% (B40) and the state mean household income is used to identify income growth inequality. This indicator aims to achieve and sustain income growth of the B40 at a rate greater than the state average. Penang recorded a mean income Compounded Annual Growth Rate (CAGR) of 6.1% in 2016. This decreased to 4.6% in 2019 and then dropped further to 2% in 2022. In contrast, the B40 mean income CAGR grew at slower rates of 5.9%, 4.3% and 0.7% during the same intervals.[10] These indicate an increasing trend of income inequality from 2016 to 2022. The state has major challenges in addressing income inequalities in relative poverty. Overall, Penang, with a score of 64.4, faces significant challenges where SDG 10 targets are concerned.

Sustainable Development Goal 11: Sustainable Cities and Communities

The population of Penang has increased dramatically from 1.17 million in 1993 to about 1.77 million in 2023 (an increase of about 51%) and is projected to rise further to 2.1 million in 2040.[10] People are moving to cities in search of employment, better quality of life, or access to better public infrastructure and facilities. The continuing demographic swing from rural to urban areas poses significant infrastructural challenges such as housing, clean water and air, and transportation. High concentrations of people might also make cities more vulnerable to climate change and natural disaster. Hence, building urban resilience is vital for avoiding human, social and economic losses.

SDG 11 aims to make cities and human settlements inclusive, safe, resilient and sustainable (UN DESA, n.d.). Due to data limitation, the assessment covers only two indicators, access to open space and access to water for urban areas.

The state has managed to provide access to water for 100% of its urban population. But major challenges remain to achieve the target for publicly available open space in urban areas. Urban green spaces, parks and waterways are important public spaces which can ease the impact of rapid and unsustainable urbanisation on public health and well-being, as well as the environment (e.g. mitigate climate change).

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[10] See Footnote 4; Department of Statistics 2023

With only 1.3% of its land space open to public users[11], Penang is far off the desired level (17%) to achieve the target by 2030. The state's performance for this indicator is in fact regressing.

Overall, with a score of 50, challenges remain in addressing the targets of SDG 11. In order to achieve sustainable development, the way urban spaces are built and managed in Penang needs to be significantly improved.

Sustainable Development Goal 14: Life below Water

SDG 14 seeks to conserve and sustainably use the oceans, seas, marine and aquatic resources (UN DESA, n.d.). It focuses on three state-related indicators, namely protected areas for marine areas, protected area coverage of important sites for biodiversity and fish caught by trawling or dredging.[12]

Relative to its land size, Penang has huge marine and aquatic resources, which present it with great opportunities. Fishing, shipping and maritime trade have historically dominated pelagic activities in Penang. Fisheries (marine-capture fisheries and aquaculture) are one of the important components of Penang's economy, and contribute to its food security and to employment. Yet, many fish stocks on the west coast of Peninsular Malaysia have been over-exploited, mainly as a result of unsustainable fishing methods. Trawling is still one of the main fishing methods used in Malaysia. This technique extensively catches marine life and damages sensitive ecosystems along the seafloor. According to the Department of Fisheries Malaysia, fish caught by trawling in Penang increased from 30.5% in 2016 to 35.4% in 2019 and then decreased to 28.1% in 2022. Significant challenges remain for Penang to achieve SDG for the indicator (threshold: 7%). More sustainable methods of fishing are required. Responsible fishing practices should be developed through educational programmes as well as through the raising of public awareness. Local communities, fishermen and stakeholders need to be involved in the conservation process at all levels.

Regarding the coverage of protected areas (fully and less protected) indicator, currently less than 0.1% of the coastal and marine areas of Penang are under a protected area (CT Atlas, 2019). With a minimum threshold of 10%, Penang has major challenges in achieving the targets of this indicator by 2030. As for protected area coverage of important sites for biodiversity, the state has recorded no sites for marine key biodiversity areas that are protected. In order to protect Penang's marine biodiversity and to ensure greater congruence with SDGs, the state government is planning to establish a marine sanctuary called the Middle Bank Marine Sanctuary (MBMS). This will be the first of its kind in Malaysia. The area is home to many important species, including species new to science, and covers about 14 square kilometres, of which less than 0.2% island (Yasin, et al., 2023).

With an overall score of 20.5, Penang faces major challenges in achieving SDG 14 targets. The state recorded the third worst performance in the country after Selangor and Perak.

Sustainable Development Goal 15: Life on Land

Poorly managed ecosystems and related biodiversity, and unsustainable use of natural resources adversely affect the livelihoods and well-being of those who depend on these resources, especially rural communities. Sustainable use of natural resources helps preserve the environment and protects both human health and ecosystems. It also provides employment and incomes, and generates economic growth.

SDG 15 is about protecting and restoring terrestrial ecosystems, sustainably managing forests, combating desertification, halting and reversing land degradation, and stopping biodiversity loss (UN

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[11] See Footnote 4.
[12] This indicator mainly refers to freshwater/wetlands acreage.

DESA, n.d.). The assessment covers three indicators, namely forest area, permanent deforestation rates, and protection of important biodiversity sites.

The proportion of land area in Penang covered by forest was recorded at 7.5% in 2018[13]–the second lowest in Malaysia after Melaka. It can be due to the high urbanisation rate and limited land areas in Penang. This indicates that the state faces major challenges in achieving the desired level (50%) of forest area by 2030. Moreover, with 0.1% permanent deforestation rate[13], Penang has significant challenges in attaining the desired target (0.05%) for the deforestation indicator. Deforestation is closely linked to biodiversity conservation. In spite of its rapid urbanisation, Penang's conservation efforts have ensured that its rich biodiversity and natural heritage are protected. One good example is the establishment of Penang Hill Biosphere reserve (PHBR), which consists of Penang Hill, six permanent forest reserves, two dams and several water catchment areas, and covers an area of about 12,481 hectares (The Habitat Foundation, n.d.). In 2021, PHBR was designated as a UNESCO Biosphere Reserve under the Man and the Biosphere (MAB) programme. The PHBR is characterised by a diverse range of terrestrial habitats, and is home to different species of plants, mammals, reptiles, birds, etc. Despite that, the state still faces major challenges in achieving the target of the mean percentage area of terrestrial key biodiversity areas by 2030 (threshold: 85%).

Among all states, Penang recorded the worst performance for SDG 15. With an overall score of 34.4, major challenges remain in achieving SDG 15 targets by 2030.

Sustainable Development Goal 16: Peace, Justice and Strong Institutions

High levels of violence, crime and insecurity have a destructive impact on a country's development. For sustainable development, peace, stability, human rights and effective governance are needed. SDG 16 aims to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (UN DESA, n.d.). The assessment covers four indicators. These are unsentenced detainees, domestic violence, government expenditures as a proportion of original approved budget, and homicide rates.

While Penang has kept homicide rates and unsentenced detainees (% of prison population) low and achieved the desired targets of these indicators, the state still faces some challenges to attain the targets for domestic violence, and government expenditures.

The domestic violence as a proportion of population dropped from 0.013% in 2016 to 0.004% in 2018, and then increased to 0.027% in 2022.[13] Despite the implementation of many strategies and plans in combatting this issue, domestic violence remains one of the most serious social problems in Malaysia. This could be due to weak law enforcement and significant barriers that women face in seeking protection under the law (Rahman, et al., 2019). More effective strategies, including in law enforcement, are needed to combat this issue and achieve the SDG target on domestic violence.

One of the major challenges for Penang to attain SDG 16 is keeping government expenditure within an acceptable variance (5%) from the original budget. According to the Auditor General of Malaysia data, the absolute variance of primary government expenditures as a proportion of original approved budget increased from 15% in 2014 to 21.9% in 2018. This indicator is intended to measure budget reliability. Actual expenditure outputs can deviate from the originally approved budget mainly as a result of inaccurate forecasts or a major macroeconomic shock.

Sustainable Development Goal 17: Partnerships for the Goals

To realise the SDGs and to implement a successful sustainable development agenda, a strong commitment to global cooperation as well as partnership between governments, the private sector and

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[13] Source: Department of Statistics Malaysia 2018.

civil societies are needed. Goal 17 seeks to revitalise the global partnership for sustainable development (UN DESA, n.d.). The assessment focuses on three main indicators, namely internet broadband subscriptions, approved foreign investments, and government revenue excluding grants. Despite being the best performer in the country, significant challenges remain for Penang to attain the SDG 17 targets.

One of the main targets of SDG 17 is knowledge sharing and cooperation for access to science, technology and innovation. This can be facilitated via the application of digital technologies. Communications infrastructures such as fixed broadband and satellite, underpin the use of digital technologies. Penang recorded 12.7 fixed broadband subscriptions per 100 inhabitants in 2019. This number increased to 17.7 in 2022[14]–a significant increase of about 39.4%. However, the state has not achieved the desired level (39.7) yet.

In terms of approved foreign direct investment, Penang has achieved the SDG target with 19.8% approved foreign investments in relation to state GDP in 2019. Given its highly integrated manufacturing supply chains, Penang is an important investment destination for some manufacturers in SDG-related sectors, such as renewable energy, in the Southeast Asia region.

All states in Malaysia face major challenges in ensuring adequate government revenue for the state. A majority of the states, including Penang, are facing regression in their SDG performance. This can be due to the federal government's control over imposing income and sales taxes. State government incomes, on the other hand, are mainly limited to land-related transaction as well as small-scale fee collection such as hawker licenses for independent revenue. In addition, the provision of most public services is done via branches of federal ministries operating at the state level. An effective decentralisation, to the extent of the state government having its own civil service, is required (Woo, 2019).

3. Accelerating SDGs Progress

Penang's major SDG challenges by indicator level and proposed measures to achieve the goals are presented in Table 1. In order to accelerate SDGs progress, a multi-stakeholder approach should be applied to leverage the inter-linkages between the SDGs, and to improve their effectiveness. The SDGs need to be integrated into state policies and public investments. It is important to provide a medium-to-long-term approach to guide sustainable development policies, with a special focus on the indicators where the state has major challenges. In addition, the SDGs progress and performance should be monitored and evaluated regularly. High-quality data are key to measure and monitor progress. Therefore, statistics for SDGs at state level need to be improved and strengthened. More investment in data and statistics will be necessary.

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[14] See Footnote 4.

Table 1: Penang's major SDG challenges by indicator level

SDG	Indicator	Proposed measures to achieve SDG
SDG 2: Zero Hunger	Stunting presence below 5 years	- More holistic and sustainable approaches are required to strengthen the food and nutrition security of children. - Improve food value chains to enhance the accessibility and affordability of sustainable healthy diets for pregnant and breastfeeding women.
	Wasting presence below 5 years	- Design food assistance programmes and improve access to age-appropriate nutritious food via social protection transfers (cash or in kind) that target mainly children below 5 years.
Goal 3: Good Health and Well-Being	Traffic death rates	- Evaluate the effectiveness of the existing strategic plans and road safety programmes. - Identify the nature and characteristic of the issue via analysing the road accident data. - Increase traffic safety awareness through community education.
SDG 4: Quality Education	Mathematics proficiency level at lower secondary	- Develop an effective instructional-support strategy to improve student proficiency in math as well as their problem-solving skills. - Involve students in the learning process through collaborative learning, active participation, and technology integration.
Goal 5: Gender Equality	Proportion of female representation for state level legislature	- Adopt measures to increase women representation, such as the seat-based direct public funding of political parties as recommended in Bersih 2.0 report (Ooi, 2021).
Goal 6: Clean Water and Sanitation	Proportion of river basins that have good water ambience	- Improve water management system and wastewater treatment. - Reduce plastic waste. - Promote green agriculture.
Goal 10: Reduced Inequalities	Difference in income growth between bottom 40% and state level income average	- A better income tax system is required to close the income gap between the richest and the poorest. - Although the "minimum wage" policy might help reduce poverty, it is inadequate to truly support households. As the cost of living goes up and the standard of living changes, there is a need for a better policy to ensure that households earn enough to reach a minimum acceptable living standard. Hence, "minimum wage" might need to be replaced by a "living wage" that factors in cost of living, which may vary by location.
Goal 11: Sustainable Cites and Communities	Average share of the built-up area of cities that is open space for public use for all	- Manage urban growth and protect open space through appropriate mix of policy, land use planning and regulatory tools.

		- Identify the potential areas to be converted to open spaces. - Develop public-private partnership for financial support and long-term management.
Goal 14: Life below Water	Mean area that is protected in marine sites important to biodiversity	- Map and identify areas of high marine biodiversity and focus on important habitat zones.
	Coverage of protected areas (fully and less protected) in relation to marine areas	
Goal 15: Life on Land	The forest area as a proportion of total land area by state	- Set the state specific land-use regulatory frameworks and targets to increase forest area.
Goal 16: Peace, Justice and Strong Institutions	Absolute variance of primary government expenditures as a proportion of original approved budget	- Monitor the budget regularly to ensure that the financial, operational and capital plans developed and approved for implementation as part of the budget processes are being implemented.
Goal 17: Partnerships for the Goals	Government revenue excluding grants	- Assign more revenue-generating and spending powers to the state government through decentralisation, where the state government has its own civil service. - Assign a larger share of tax revenue to the state governments, based on the level of their economic development and tax revenue contribution.

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