



**SECTORAL UPDATE:  
WATER SECTOR**

ECONOMIC RESEARCH  
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# OVERVIEW

# WATER, SEWERAGE, AND WASTE MANAGEMENT SUBSECTOR SHOWS SIGNS OF IMPROVEMENT IN 2025

- The water sector remains a foundational pillar of Malaysia’s social well-being, economic development, and environmental stewardship. Its strategic importance spans public health, industrial expansion, and the nation’s broader ESG commitments. Any disruption or inefficiency in water services has far-reaching implications, particularly for water-intensive industries, making effective governance and long-term planning a national priority. In this context, the Water Sector Transformation 2040 (WST 2040), launched in 2020, serves as Malaysia’s core blueprint to modernise the sector, strengthen water security, and ensure that resource management keeps pace with economic and environmental demands.
- Within Malaysia’s GDP framework, the water sector is captured under the “water, sewerage, and waste management” subsector of the services industry, which generated more than RM9.0 billion in real output in 2024. After expanding 4.1% in 2023, the subsector contracted by 3.4% in 2024, reflecting weaker operational efficiency and softer demand conditions. Quarterly data highlight a sustained downturn since 2Q2024, with the steepest decline of 5.5% recorded in 4Q2024.
- However, its performance gradually improved and recorded an expansion of 3.5% in 3Q2025. This improvement indicates a recovery driven by rising demand from industrial users, data centers, and broader urban development. Continued efforts to address these issues will be essential to sustaining this momentum and unlocking the sector’s full growth potential. As demand increases, service providers may see higher consumption, and greater utilization of water or waste management infrastructure contributing to growth.

| GDP sector / sub-sectors                        | % Share of GDP (as of 2024) | Sectoral Performance heat map (YoY,%) - Annual |      |      |      |      |      |      |      |
|---|-----------------------------|--|------|------|------|------|------|------|------|
|   |                             | 2017   | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Services – Water, sewerage and waste management | 0.6                         | 6.1  | 6.7  | 7.7  | 7.9  | 5.8  | 2.7  | 4.1  | -3.4 |

| GDP sector / sub-sectors                        | Sectoral Performance heat map (YoY,%) - Quarter |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | 1Q 22   | 2Q 22 | 3Q 22 | 4Q 22 | 1Q 23 | 2Q 23 | 3Q 23 | 4Q 23 | 1Q 24 | 2Q 24 | 3Q 24 | 4Q 24 | 1Q 25 | 2Q 25 | 3Q 25 |
| Services – Water, sewerage and waste management | 0.7   | 0.2   | 5.1   | 4.7   | 4.3   | 7.0   | 2.7   | 2.7   | 0.1   | -4.0  | -3.9  | -5.5  | 0.7   | 1.7   | 3.5   |

Sources: DOSM, Bank Islam

Note: GDP is the monetary value of all finished goods and services produced within a country during a specific period.

# **GOVERNMENT PLAN / TARGET**

# WATER SECTOR TRANSFORMATION PROGRAM (WST 2040), ALIGNS WITH UN SDGs

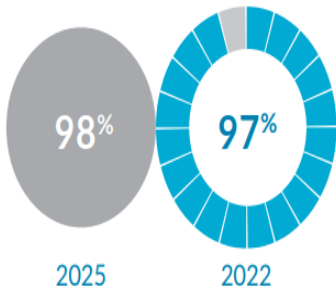
- In 2020, the Malaysian government launched the Water Sector Transformation Program (WST 2040), a long-term national agenda expected to contribute meaningfully to the country's GDP. The framework aims to modernise Malaysia's water services industry by strengthening system resilience, reducing non-revenue water losses, and ensuring long-term water security through sustainable and integrated resource management.
- The initiative is also closely aligned with the global commitments under the United Nations Sustainable Development Goals; SDG 6: *Clean Water and Sanitation*; with several WST 2040 targets mirroring SDG indicators. This national agenda will be carried out progressively through four transformation phases spanning the 12<sup>th</sup> to 15<sup>th</sup> Malaysia Plan.



Sources: WST2040, United Nations, Bank Islam

# TRANSFORMING THE WATER SECTOR UNDER THE NATIONAL PLAN

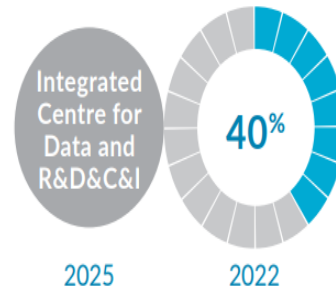
## Target under Mid-term Review of 12MP (2021-2025)



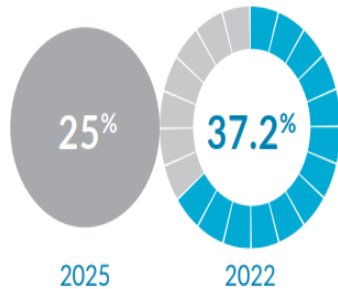
Coverage of Access to Clean and Safe Water in Rural Area



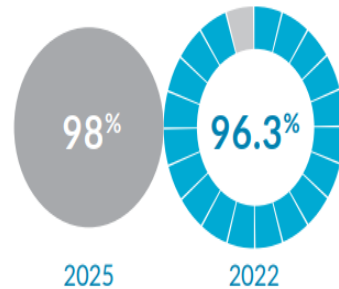
Total Maximum Daily Load Study Conducted for Critical Rivers



Establishment of an Integrated Centre for Water Data and R&D&C&I



Percentage of Non-Revenue Water



Coverage of Safely Managed Sanitation System in Rural Area

## Target under 13MP (2026-2030)

- Strengthen greywater management by improving legislation and expanding awareness programs at the premises of discharge.
- Develop an integrated management system to monitor the full life cycle of chemicals, from import or local production to disposal.
- Continue initiatives to reduce non-revenue water (NRW) and raw water consumption, as well as promote the sustainable use of reclaimed and recycled water to diversify water sources and enhance water security.
- Accelerate innovation in local water technologies, especially in water treatment and recycling systems.
- Enhance smart water management and monitoring systems to improve efficiency and reliability.
- These efforts support the WST 2040, which aims to enhance the sustainability and resilience of Malaysia's national water sector.

Sources: Mid-Term Review of the Twelfth Malaysia Plan (12MP), 13MP, Various Sources, Bank Islam

# WATER SECTOR RELATED PROJECT ANNOUNCED IN BUDGET 2026

| Projects Under Budget 2026  | State           |
|---|-----------------|
| <ul style="list-style-type: none"> <li>Upgrade of the water intake facilities at Titi Kerawang and Teluk Awak</li> <li>Installation of raw water pipes from the intake point to the Teluk Bahang Dam</li> </ul>   | Penang          |
| <ul style="list-style-type: none"> <li>Sungai Karangan Riverbank Water Reservoir, Kulim</li> <li>The Jeniang Water Transfer Project to create a new river for irrigation that supports the Program Penanaman Padi Lima Musim Dua Tahun</li> </ul>                                   | Kedah           |
| <ul style="list-style-type: none"> <li>Regional Sewage Treatment Plant for Mukim Tiong and Mukim Jelutong, including the construction of sewerage pipe networks and rationalisation works in parts of the sub-catchment area of the Bandar Baru Tunjong Zone, Kota Bharu</li> </ul> | Kelantan        |
| <ul style="list-style-type: none"> <li>Rural Water Supply System for Pasir Mas</li> </ul>   | Melaka          |
| <ul style="list-style-type: none"> <li>Construction of a riverbank barrage and water retention structure at Sungai Pedas, Rembau</li> </ul>   | Negeri Sembilan |
| <ul style="list-style-type: none"> <li>River conservation works to reduce flood risk in the Federal Territory of Labuan</li> </ul>  | WP Labuan       |
| <ul style="list-style-type: none"> <li>Water projects including the installation of new pipelines in Tawau</li> <li>Upgrading of old pipes in Kota Kinabalu, Penampang and Putatan</li> </ul>   | Sabah           |

## Projects Coverage of Clean Water Supply Nationwide

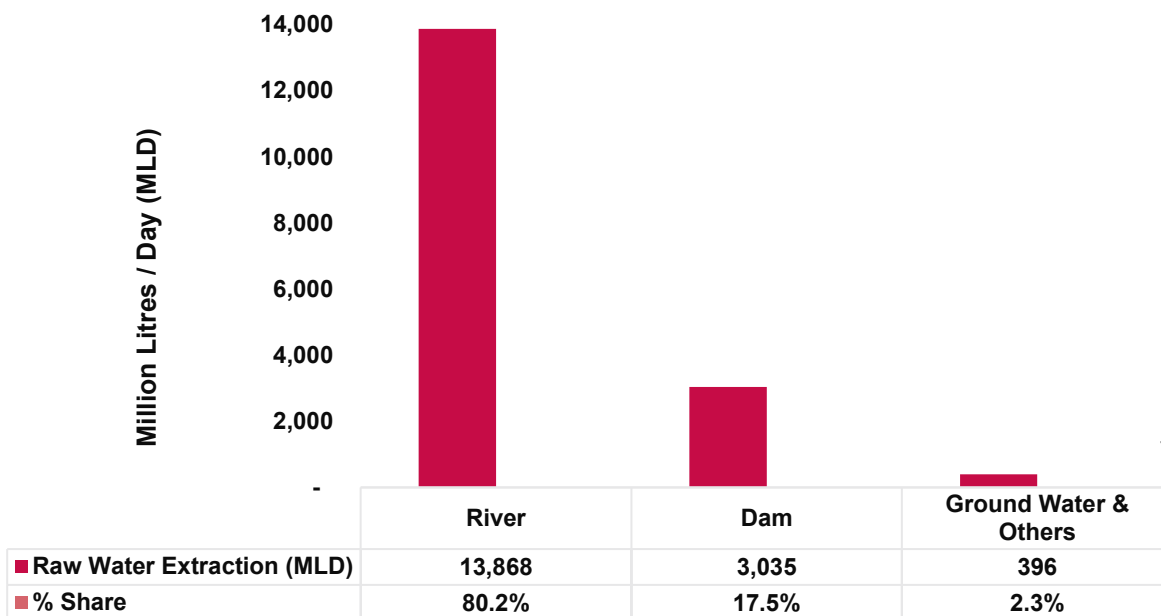
- Pengurusan Aset Air Bhd (PAAB) pledges investments of up to RM13 billion for five years.
- The Langat 2 Water Treatment Plant (WTP) with a capacity to treat up to 760 million liters per day for the benefit of 1.5 million people in Selangor, Kuala Lumpur and Putrajaya.
- Meanwhile, the Machang, Sungai Karangan and Sidam Kiri, Kedah WTP have a combined plant capacity of up to 200 million litres per day.
- The Government will continue the National Non-Revenue Water (NRW) programme with a cost of RM3 billion.
- The focus for 2026 is on replacing over 820km of old pipes in Johor, Melaka, Negeri Sembilan, Kelantan, Pahang and Selangor.
- The Government is also continuing the construction of underground dams, tube wells and retention structures in Padang Matsirat, Langkawi, costing over RM400 million.

# **KEY STATISTICS OF WATER SECTOR**

# TOTAL RAW WATER EXTRACTION IN MALAYSIA

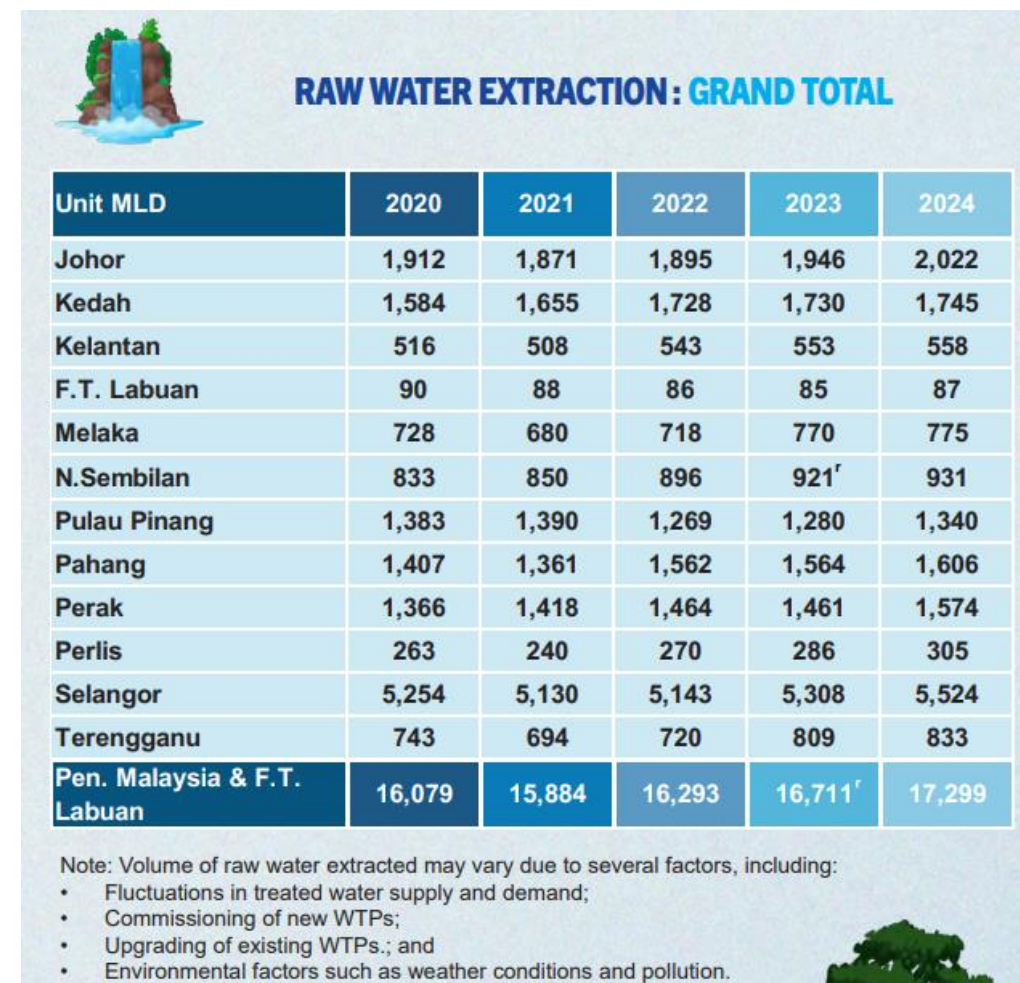
Selangor recorded the highest raw water extraction in Peninsular Malaysia

Source of Raw Water, 2024



Sources: *Water and Sewerage Factbook 2024*

- In 2024, total raw water extraction stood at 17,299 MLD, with rivers supplying over 80% of the volume. The remaining share came from dams (17.5%) and ground water & other sources (2.3%).
- By state, Selangor recorded the highest raw water extraction in Peninsular Malaysia, followed by Johor, Kedah, Pahang and Perak.



Sources: *Water and Sewerage Factbook 2024*

# RAW WATER SOURCES BY STATE

## Raw Water Resources by Type and State in 2024 (MLD and by % Share)

|   | River         | Dam          | Ground Water & Others | Total         |
|---|---------------|--------------|-----------------------|---------------|
| Johor                                       | 1,180         | 842          | -                     | 2,022         |
| Kedah                                       | 1,720         | 25           | -                     | 1,745         |
| Kelantan                                    | 313           | -            | 244.5                 | 557.5         |
| F.T. Labuan                                 | 78            | 9            | -                     | 87            |
| Melaka                                      | 365           | 262          | 148                   | 775           |
| N.Sembilan                                  | 451           | 480          | -                     | 931           |
| Pulau Pinang                                | 1,226         | 114          | -                     | 1,340         |
| Pahang                                      | 1,560         | 44           | 2                     | 1,606         |
| Perak                                       | 1,277         | 297          | -                     | 1,574         |
| Perlis                                      | 198           | 105          | 1.5                   | 304.5         |
| Selangor                                    | 4,924         | 600          | -                     | 5,524         |
| Terengganu                                  | 575           | 258          | -                     | 833           |
| <b>Peninsular Malaysia &amp; F.T Labuan</b> | <b>13,868</b> | <b>3,035</b> | <b>396</b>            | <b>17,299</b> |


|              | River | Dam | Ground Water & Others | Total |
|--------------|-------|-----|-----------------------|-------|
| Johor        | 58%   | 42% | 0%                    | 100%  |
| Kedah        | 99%   | 1%  | 0%                    | 100%  |
| Kelantan     | 56%   | 0%  | 44%                   | 100%  |
| F.T. Labuan  | 90%   | 10% | 0%                    | 100%  |
| Melaka       | 47%   | 34% | 19%                   | 100%  |
| N.Sembilan   | 48%   | 52% | 0%                    | 100%  |
| Pulau Pinang | 91%   | 9%  | 0%                    | 100%  |
| Pahang       | 97%   | 3%  | 0%                    | 100%  |
| Perak        | 81%   | 19% | 0%                    | 100%  |
| Perlis       | 65%   | 34% | 0%                    | 100%  |
| Selangor     | 89%   | 11% | 0%                    | 100%  |
| Terengganu   | 69%   | 31% | 0%                    | 100%  |

Sources: Water and Sewerage Factbook 2024

- In Peninsular Malaysia, Selangor registered the largest raw water extraction from rivers in 2024 at 4,924 MLD, supplemented by 600 MLD from dams, bringing its total extraction to 5,524 MLD.
- While most states rely heavily on rivers as their primary water source, Negeri Sembilan's dam water makes up more than half of supply. Johor also relies significantly on dam water, which contributes 42% of its supply.
- Meanwhile, Kelantan depends predominantly on ground water and other sources, which contributes around 44% of its total water supply.
- Among all states, Melaka is unique in having a balanced and substantial mix of all three water sources, comprising 47% from river, 34% from dams, and 19% from ground water & others. Whereas Kedah relies almost entirely on river water, which makes up 99% of its total supply.


# WATER TREATMENT, CAPACITY, AND PRODUCTION

## Number of Water Treatment Plants (WTP), WTP Design Capacity and Water Production by State



**NO. OF WATER TREATMENT PLANTS (WTP)**

| Unit (Nos)                  | 2020 | 2021 | 2022 | 2023 | 2024 |
|-----------------------------|------|------|------|------|------|
| Johor                       | 46   | 46   | 46   | 47   | 47   |
| Kedah                       | 38   | 35   | 35   | 35   | 35   |
| Kelantan                    | 35   | 39   | 41   | 42   | 43   |
| F.T. Labuan                 | 6    | 6    | 6    | 6    | 6    |
| Melaka                      | 10   | 11   | 12   | 12   | 12   |
| N.Sembilan                  | 21   | 21   | 21   | 22   | 22   |
| Pulau Pinang                | 9    | 9    | 9    | 9    | 9    |
| Pahang                      | 74   | 74   | 74   | 75   | 76   |
| Perak                       | 43   | 44   | 46   | 46   | 46   |
| Perlis                      | 4    | 4    | 4    | 4    | 4    |
| Selangor                    | 34   | 34   | 34   | 34   | 34   |
| Terengganu                  | 12   | 12   | 16   | 16   | 16   |
| Pen. Malaysia & F.T. Labuan | 332  | 335  | 344  | 348  | 350  |



**WTP DESIGN CAPACITY**

| Unit MLD                    | 2020   | 2021   | 2022   | 2023                | 2024   |
|-----------------------------|--------|--------|--------|---------------------|--------|
| Johor                       | 2,098  | 2,133  | 2,133  | 2,313               | 2,352  |
| Kedah                       | 1,494  | 1,457  | 1,459  | 1,459               | 1,459  |
| Kelantan                    | 439    | 488    | 537    | 546 <sup>f</sup>    | 550    |
| F.T. Labuan                 | 101    | 101    | 104    | 104                 | 104    |
| Melaka                      | 651    | 651    | 681    | 736                 | 736    |
| N.Sembilan                  | 994    | 994    | 1,048  | 1,050               | 1,050  |
| Pulau Pinang                | 1,599  | 1,599  | 1,599  | 1,609               | 1,723  |
| Pahang                      | 1,480  | 1,612  | 1,615  | 1,623               | 1,624  |
| Perak                       | 1,886  | 1,891  | 1,951  | 1,977               | 1,977  |
| Perlis                      | 211    | 211    | 251    | 251                 | 279    |
| Selangor                    | 6,036  | 6,035  | 6,035  | 6,035               | 6,035  |
| Terengganu                  | 851    | 873    | 1,045  | 1,039               | 1,035  |
| Pen. Malaysia & F.T. Labuan | 17,840 | 18,047 | 18,460 | 18,744 <sup>f</sup> | 18,925 |



**WATER PRODUCTION**

| Unit MLD                    | 2020   | 2021   | 2022   | 2023   | 2024   |
|-----------------------------|--------|--------|--------|--------|--------|
| Johor                       | 1,831  | 1,848  | 1,837  | 1,867  | 2,001  |
| Kedah                       | 1,487  | 1,538  | 1,597  | 1,602  | 1,600  |
| Kelantan                    | 507    | 504    | 517    | 522    | 526    |
| F.T. Labuan                 | 82     | 84     | 83     | 81     | 82     |
| Melaka                      | 578    | 603    | 649    | 692    | 698    |
| N.Sembilan                  | 795    | 811    | 848    | 874    | 880    |
| Pulau Pinang                | 1,108  | 1,126  | 1,178  | 1,198  | 1,208  |
| Pahang                      | 1,269  | 1,281  | 1,337  | 1,333  | 1,314  |
| Perak                       | 1,392  | 1,386  | 1,418  | 1,416  | 1,470  |
| Perlis                      | 243    | 236    | 243    | 262    | 251    |
| Selangor                    | 4,967  | 4,985  | 5,116  | 5,226  | 5,308  |
| Terengganu                  | 657    | 656    | 720    | 773    | 787    |
| Pen. Malaysia & F.T. Labuan | 14,916 | 15,058 | 15,542 | 15,844 | 16,124 |


Sources: *Water and Sewerage Factbook 2024*

Note: WTP design capacity refers to the maximum amount of water that a WTP is engineered and build to treat per day. It is a critical indicator for the water sector because it determine whether a state can produce enough clean water to meet current and future demand. Theoretically, it is the upper limit of production

- Although Selangor has the largest raw water extraction in Peninsular Malaysia, it operates only about 34 water treatment plants because its facilities and capacities are large, centralized and more efficient.
- The large, and high-capacity water treatment plants such as Langat 2 and the multiple phases of Sungai Selangor allow for treatment of very large volumes of water, which is sufficient to meet the demands of a dense urban population. As a result, these regions rely on a network of major WTPs rather than a proliferation of many small plants. Selangor could treat up to 6,035 MLD in 2024 based on the design capacity of its WTPs, the highest in Peninsular Malaysia.
- In contrast, many other states, especially those with more dispersed or rural populations, rely on a large number of smaller, lower-capacity WTPs to cover wide areas, resulting in a higher count of plants despite their lower overall water extraction. This reflects differences in urbanization, geography, and water demand patterns across the country.
- Meanwhile, water production is the actual amount of treated water produced daily by the WTP. This is the real operating output, which must stay within the design capacity, and the production fluctuates depending on demand, maintenance, and raw water quality.


# WATER DEMAND AND RESERVE MARGIN

## Water Demand and Reserve Margin by State



**WATER DEMAND:  
SYSTEM INPUT VOLUME (SIV)**

| Unit MLD                    | 2020   | 2021   | 2022   | 2023   | 2024   |
|-----------------------------|--------|--------|--------|--------|--------|
| Johor <sup>+</sup>          | 1,900  | 1,848  | 1,909  | 1,942  | 2,001  |
| Kedah                       | 1,487  | 1,538  | 1,597  | 1,602  | 1,600  |
| Kelantan                    | 507    | 504    | 517    | 522    | 526    |
| F.T. Labuan                 | 82     | 84     | 83     | 81     | 82     |
| Melaka                      | 578    | 603    | 649    | 692    | 698    |
| N.Sembilan                  | 795    | 811    | 848    | 874    | 880    |
| Pulau Pinang                | 1,108  | 1,126  | 1,178  | 1,198  | 1,208  |
| Pahang                      | 1,269  | 1,281  | 1,337  | 1,333  | 1,314  |
| Perak                       | 1,392  | 1,386  | 1,418  | 1,416  | 1,470  |
| Perlis <sup>+</sup>         | 256    | 249    | 256    | 275    | 265    |
| Selangor                    | 4,967  | 4,985  | 5,116  | 5,226  | 5,308  |
| Terengganu <sup>+</sup>     | 685    | 685    | 747    | 790    | 817    |
| Pen. Malaysia & F.T. Labuan | 15,026 | 15,100 | 15,653 | 15,950 | 16,167 |



**RESERVE MARGIN**


| Unit (%)                    | 2020  | 2021  | 2022  | 2023               | 2024  |
|-----------------------------|-------|-------|-------|--------------------|-------|
| Johor                       | 9.7%  | 14.3% | 11.5% | 16.8%              | 15.7% |
| Kedah                       | 0.0%  | 0.0%  | 0.0%  | 0.0%               | 0.0%  |
| Kelantan                    | 0.0%  | 0.0%  | 0.0%  | 4.6% <sup>r</sup>  | 4.4%  |
| F.T. Labuan                 | 18.7% | 17.1% | 20.3% | 22.6%              | 21.2% |
| Melaka                      | 11.2% | 7.5%  | 4.7%  | 6.1%               | 5.2%  |
| N.Sembilan                  | 20.0% | 18.4% | 19.1% | 16.8%              | 16.2% |
| Pulau Pinang                | 30.7% | 29.6% | 26.4% | 25.6%              | 29.9% |
| Pahang                      | 14.2% | 20.6% | 17.3% | 17.9%              | 19.1% |
| Perak                       | 26.2% | 26.7% | 27.3% | 28.4%              | 25.7% |
| Perlis                      | 1.9%  | 4.5%  | 8.4%  | 1.3%               | 5.0%  |
| Selangor                    | 0.0%  | 17.4% | 15.2% | 13.4%              | 12.1% |
| Terengganu                  | 23.6% | 25.7% | 31.8% | 27.5%              | 24.8% |
| Pen. Malaysia & F.T. Labuan | 16.3% | 16.9% | 15.7% | 15.4% <sup>r</sup> | 14.9% |

Sources: Water and Sewerage Factbook 2024

- System Input Volume (SIV) represents the total treated water fed into the distribution system to meet consumer demand. It includes domestic consumption, industrial use, commercial usage and losses. In the simple term, SIV is the combination of water demand and system losses like non-revenue water (NRW) which refers to treated water that is lost before reaching consumers. Hence, SIV often higher than actual consumer usage.
- Meanwhile, the reserve margin measures the gap between a state's total water treatment capacity and its actual water demand. It indicates how much extra capacity is available to accommodate rising consumption or unexpected supply interruptions like droughts and infrastructure failure. A smaller reserve margin signals a greater risk of shortages or water cuts, vice versa.
- Pulau Pinang, Perak, and Terengganu exhibit high reserve margins, reflecting substantial excess water treatment capacity relative to their demand. This position them well to absorb future demand increases and respond effectively to unexpected operational disruptions. In contrast, Kedah stands out with a 0% reserve margin, while Kelantan, Perlis and Melaka have very low level of water reserve margins, making them highly vulnerable to supply disruptions, which could be further exacerbated during prolonged drought.
- The National Water Services Commission (SPAN) recommends maintaining a water reserve margin of 10% to 15% to ensure system stability.

# NON-REVENUE WATER (NRW) AND AGE OF METER

## Non-Revenue Water (NRW) and Water Meters' Age by State



**NON - REVENUE WATER (NRW)**

| Unit (%)                    | 2020  | 2021  | 2022  | 2023  | 2024  |
|-----------------------------|-------|-------|-------|-------|-------|
| Johor                       | 26.7% | 25.1% | 26.3% | 25.0% | 24.1% |
| Kedah                       | 48.4% | 49.9% | 51.5% | 50.7% | 51.1% |
| Kelantan                    | 51.7% | 52.6% | 53.7% | 54.5% | 53.7% |
| F.T. Labuan                 | 33.6% | 37.6% | 36.8% | 37.6% | 38.3% |
| Melaka                      | 30.0% | 31.2% | 33.2% | 35.1% | 34.4% |
| N.Sembilan                  | 31.8% | 32.3% | 35.1% | 38.9% | 36.4% |
| Pulau Pinang                | 23.5% | 23.6% | 26.3% | 26.8% | 28.0% |
| Pahang                      | 50.3% | 49.3% | 47.7% | 47.7% | 48.6% |
| Perak                       | 30.1% | 29.6% | 30.3% | 30.2% | 31.9% |
| Perlis                      | 64.9% | 63.3% | 61.5% | 64.5% | 61.5% |
| Selangor                    | 28.5% | 27.5% | 27.8% | 27.8% | 27.0% |
| Terengganu                  | 35.2% | 32.8% | 38.7% | 40.1% | 40.2% |
| Pen. Malaysia & F.T. Labuan | 33.8% | 33.4% | 34.4% | 34.6% | 34.3% |

|              | No. of Water Meters |               | % No. of Water Meters |               |
|--------------|---------------------|---------------|-----------------------|---------------|
|              | Age 0-7 Years       | Age > 7 Years | Age 0-7 Years         | Age > 7 Years |
| Johor        | 1,183,698           | 128,838       | 90.2%                 | 9.8%          |
| Kedah        | 345,313             | 136,309       | 71.7%                 | 28.3%         |
| Kelantan     | 208,958             | 63,636        | 76.7%                 | 23.3%         |
| F.T. Labuan  | 17,297              | 4,502         | 79.3%                 | 20.7%         |
| Melaka       | 323,909             | 28,890        | 91.8%                 | 8.2%          |
| N.Sembilan   | 331,289             | 122,168       | 73.1%                 | 26.9%         |
| Pulau Pinang | 503,742             | 200,379       | 71.5%                 | 28.5%         |
| Pahang       | 345,313             | 136,309       | 71.7%                 | 28.3%         |
| Perak        | 699,537             | 185,953       | 79.0%                 | 21.0%         |
| Perlis       | 49,586              | 32,084        | 60.7%                 | 39.3%         |
| Selangor     | 2,512,678           | 230,401       | 91.6%                 | 8.4%          |
| Terengganu   | 157,355             | 162,201       | 49.2%                 | 50.8%         |
| Total        | 6,678,675           | 1,431,670     | 82.3%                 | 17.7%         |

Sources: Water and Sewerage Factbook 2024

- Kedah, Kelantan, and Perlis record NRW's level above 50%, indicating that more than half of their treated water is lost or unaccounted for due to unbilled consumption. Conversely, Johor and Selangor have maintained NRW levels below 30% and continue to record a gradual downward trend, highlighting the effectiveness of their infrastructure-modernisation strategies, enhanced metering systems, and targeted efforts to curb non-authorized consumption. Notably, both states have less than 10% of water meters older than seven years, reflecting consistent investment in metering upgrades. This systematic modernisation has played a key role in sustaining their comparatively low NRW levels.
- SPAN has set a target to reduce NRW to 31% by 2025, yet the national average for Peninsular Malaysia and Labuan stood at 34.3% in 2024. To address the structural financial gaps in the sector, SPAN introduced the Tariff Structure Mechanism (TSM) in 2018 to support the transition toward full cost recovery and to enable water operators to reinvest in critical infrastructure, including NRW-reduction initiatives. Yet, persistent public resistance to tariff adjustments has slowed the implementation of TSM, resulting in an estimated annual revenue shortfall of RM1.2 billion for water operators. This financial constraint has direct implications for asset renewal, particularly the replacement of ageing pipes, which remains the single most important measure to bring down NRW.

# NEGATIVE EFFECTS OF HIGH LEVELS OF NRW

## Revenue Impact:

When treated water fails to reach end users due to leaks, theft, or metering inaccuracies, water companies lose potential revenue. This undermines their financial capacity to fund essential maintenance, asset rehabilitation, and infrastructure upgrades—ultimately reinforcing a cycle of inefficiency and underinvestment.

## Resource Waste:

Lost water also represents wasted energy, chemicals, manpower, and other operational inputs used in treatment and distribution. Over time, these inefficiencies inflate operating costs and reduce the sector's overall productivity.

## Pressure on Water Supply:

In places where water is scarce, high NRW exacerbates shortages by forcing utilities to treat and produce additional volumes merely to meet baseline demand. This places unnecessary strain on raw water sources and accelerates resource depletion, especially during dry seasons or drought conditions.

## Higher Water Tariffs:

To compensate for revenue shortfalls caused by excessive NRW, utilities may eventually need to adjust tariffs. This shifts the financial burden onto consumers, who end up paying more for the portion of water that is successfully delivered, highlighting how inefficiencies within the system can translate into higher household and commercial costs.

# **RISING IMPORTANCE OF WATER SECTOR**

# WHY IS WATER SECTOR BECOMING INCREASINGLY IMPORTANT?

- The Malaysian water sector is at a critical juncture amid ageing infrastructure, industrial demand, and environmental pressures. This creates opportunities for banks, investors and service providers to focus on financing infrastructure upgrades, innovative solutions and sustainable water management.

## Ageing Infrastructure

- Water systems in Malaysia are **old and poorly maintained**.
- Issues include leaks and pipe bursts, **high non-revenue water (NRW)** and inefficient water treatment and distribution. Over RM2.0 billion is lost annually due to NRW, with several states losing more than 50% of treated water.
- This **wastage increases operational costs** for water utilities.
- Thus, ageing water infrastructure emphasizes the urgent need for system upgrades, modernization, and investment in smart water management technologies.
- This **gap creates opportunities for private sector participation** and the adoption of innovative, technology-driven solutions to improve service reliability and reduce water losses.

## Rapid Growth of Water Intensive Industries

- Malaysia has seen a **boom in data center** due to its strategic location and digital growth.
- These centers need **vast amounts of treated water to cool** server continuously.
- Other industries such as manufacturing, agriculture, electronics, and food processing also demand large water volumes.
- These **creates new market opportunities** for water suppliers and service providers.
- It also drives demand for high-quality, reliable, and sustainable water solutions.

## Climate Change & Environmental Pressures

- **Changes in rainfall patterns** caused by climate change (such as prolonged droughts), may reduce water resources. Malaysia relies heavily on rivers for its freshwater.
- **Extreme weather events** like heavy floods disrupt water supply and treatment operations. Floods can contaminate raw water sources by washing mud, sewage, chemicals and debris into rivers and reservoirs, causing water quality to deteriorate rapidly. This will increase the treatment cost.
- **Water pollution** lead by industrial discharge, untreated sewage, and agricultural runoff, which resulting in higher treatment costs and additional pressure on water management system.
- Due to the above challenges, the **risks on water scarcity is rising** and pushing the governments and companies to invest in water treatment and efficient distribution. This has raised the urgency for resilient water infrastructure.

Overall, there is strong investment potential in the water sector through upgrading ageing infrastructure, building new treatment plants, implementing smart metering, adopting leak-detection and NRW reduction, and developing water reuse and recycling systems.

# KEY CHALLENGES & RISKS IN WATER SECTOR

**Aging Infrastructure:** Much of Malaysia's water network is old, with pipes and plants operating beyond their intended lifespan. This leads to frequent leaks, breakdowns, and service disruptions.

**Rising Demand from Data Centre:** The rapid growth of data centre is pushing water demand higher, particularly in Klang Valley and Johor. These facilities require a continuous supply for cooling, adding pressure on already stretched systems.

**High Non-Revenue Water (NRW):** Leakages, inaccurate meters, and illegal connections cause significant water loss. In some states, more than half of treated water never reaches consumers, reducing supply efficiency and raising operational costs.

**Tariff Constraint:** Water tariffs remain low relative to production cost. With limited revenue, operators struggle to upgrade infrastructure, address NRW, or invest in long-term improvements.

# OPPORTUNITIES IN WATER SECTOR

**Accelerated Infrastructure Upgrading:** The presence of ageing pipes and treatment plants creates a strong pipeline of investment opportunities. More capital expenditure is expected over the next decade to replace old systems and increase capacity.

**Growth from Data Centre Expansion:** On the positive side, rising water demand from data centers can also create opportunities in building dedicated water supply lines for industrial users, developing recycled water or treated wastewater for cooling and investing in high-efficiency cooling technologies.

**Non-Revenue Water (NRW) as a High-Return Investment:** High NRW levels open the door for smart metering and digital monitoring solutions, AI-powered leak detection, and pressure management systems. Utilities save costs and increase revenue simultaneously.

**Expansion of Alternative Water Sources:** To reduce pressure on rivers and reservoirs, opportunities emerge in rainwater harvesting solutions, groundwater development, recycled water for industrial use and stormwater capture systems. Diversified sources increase water security and support industrial growth.

**Climate Adaptation and Flood/Drought Resilience:** As climate risks rise, new opportunities include flood mitigation infrastructure, drought-resilient supply strategies, water storage expansion and climate-resilient design for new WTPs. Overall, government prioritisation of climate resilience drives investment opportunities.

## SUMMARY

- The water sector is a critical pillar supporting Malaysia's economic growth, public health, and environmental sustainability. Its strategic importance is reinforced through key national frameworks, most notably the Water Sector Transformation 2040 (WST 2040), which will be implemented in four phases across the 12th to 15th Malaysia Plans. WST 2040 sets out a comprehensive long-term agenda to modernise water services, strengthen system resilience, reduce losses, and ensure sustainable resource management. The framework also aligns closely with global commitments under SDG 6: Clean Water and Sanitation, underscoring Malaysia's commitment to universal access, efficiency, and sustainable water governance.
- After contracting by 3.4% in 2024 and experiencing sustained quarterly declines, the GDP growth for water, sewerage, and waste management segment under services sector showed recovery with a 3.5% expansion in 3Q2025. This rebound reflects rising demand from industrial users, data centers, and growing urban development, suggesting that ongoing policy and infrastructure improvements are beginning to stabilize the subsector's performance and restore growth momentum.
- Nonetheless, ageing infrastructure and high non-revenue water (NRW) remain major structural weaknesses. Much of the country's water infrastructure is old and inefficient, leading to leaks, pipe burst, and service disruptions. High NRW levels exceeding 50% in states like Kedah, Kelantan, and Perlis, signal severe system inefficiency, financial losses and operational strain. In contrast, Selangor and Johor show progress with NRW below 30%, demonstrating the benefits of modernization, proactive leak detection and improved metering.
- Rapid growth of data centers, and water-intensive industries significantly increases demand for treated water, especially in Klang Valley and Johor. These sectors require continuous, high-quality supply for cooling and operations, placing additional pressure on already strained system. Additionally, the risk of changes in rainfall patterns caused by prolonged droughts may reduce water resources. On the positive note, this trend creates new opportunities for expanding industrial water infrastructure, recycled water applications, and high-efficiency cooling technologies.
- On the broader perspective, the combination of ageing assets, climate risks, industrial expansion, and the push for sustainability presents a strong pipeline of investment opportunities. Key areas include upgrading old pipes and treatment plants, deploying smart metering and AI-enabled leak detection, developing alternative water sources such as recycled water and groundwater, and implementing climate-resilient infrastructure. These opportunities are supported by government prioritization and rising ESG-focused investment flows.

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**Thank You**