

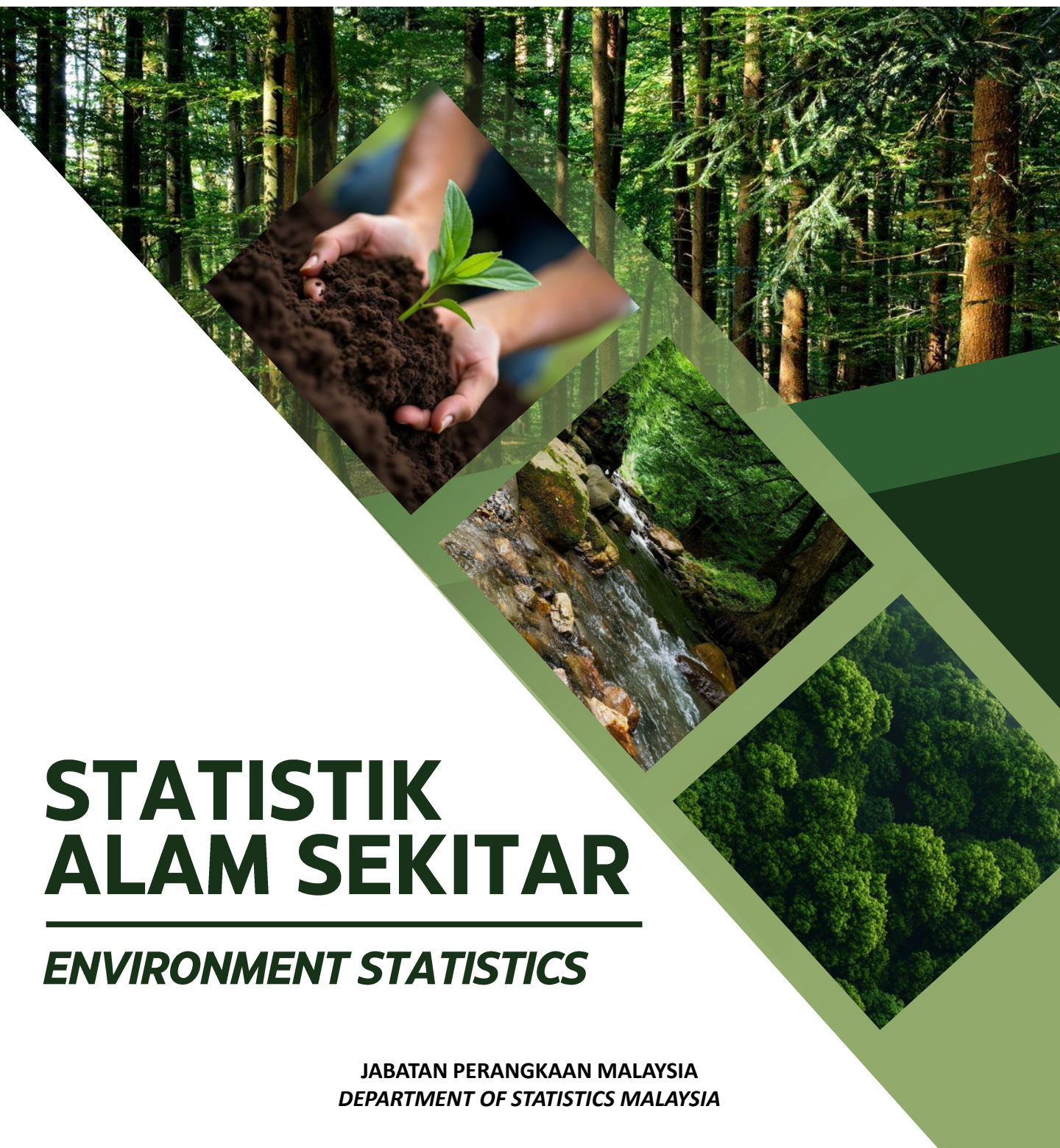


KEMENTERIAN EKONOMI
JABATAN PERANGKAAN MALAYSIA

SARAWAK



2025



STATISTIK ALAM SEKITAR

ENVIRONMENT STATISTICS

JABATAN PERANGKAAN MALAYSIA
DEPARTMENT OF STATISTICS MALAYSIA



KEMENTERIAN EKONOMI
JABATAN PERANGKAAN MALAYSIA

STATISTIK ALAM SEKITAR ENVIRONMENT STATISTICS SARAWAK 2025

Pemakluman

Malaysia buat julung kalinya telah menduduki tangga pertama (1) di peringkat global dalam laporan dwi-tahunan *Open Data Inventory* (ODIN) 2024/25 yang dikeluarkan oleh *Open Data Watch* (ODW), mengatasi 197 negara lain. Pencapaian ini merupakan lonjakan ketara daripada kedudukan ke-67 dalam penilaian ODIN 2022/23.

OpenDOSM NextGen adalah medium yang menyediakan katalog data dan visualisasi bagi memudahkan pengguna menganalisis pelbagai data dan boleh diakses melalui portal <https://open.dosm.gov.my>.

Announcement

Malaysia, for the first time, ranked as number one (1) globally in the biennial Open Data Inventory (ODIN) 2024/25 report released by Open Data Watch (ODW), surpassing 197 other countries. This achievement marks a significant leap from its 67th position in the ODIN 2022/23 assessment.

OpenDOSM NextGen is a medium that provides data catalogue and visualisations to facilitate users' analysis and can be accessed through <https://open.dosm.gov.my>.

JABATAN PERANGKAAN MALAYSIA
DEPARTMENT OF STATISTICS MALAYSIA

Diterbitkan dan dicetak oleh/ *Published and printed by:*

Jabatan Perangkaan Malaysia

Department of Statistics Malaysia

Blok C6 & C7, Kompleks C,

Pusat Pentadbiran Kerajaan Persekutuan

62514 Putrajaya,

MALAYSIA

Tel.	:	03-8885 7000
Faks	:	03-8888 9248
Portal	:	https://www.dosm.gov.my
Facebook / X / Instagram/ YouTube	:	StatsMalaysia
Emel / <i>E-mail</i>	:	info@dosm.gov.my (pertanyaan umum/ <i>general enquiries</i>) data@dosm.gov.my (pertanyaan & permintaan data/ <i>data request & enquiries</i>)

Harga / *Price* : RM20.00

Diterbitkan pada Disember 2025/ *Published on December 2025*

Hakcipta terpelihara/ *All rights reserved.*

Tiada bahagian daripada terbitan ini boleh diterbitkan semula, disimpan untuk pengeluaran atau ditukar dalam apa-apa bentuk atau alat apa jua pun kecuali setelah mendapat kebenaran daripada Jabatan Perangkaan Malaysia. Pengguna yang mengeluarkan sebarang maklumat dari terbitan ini sama ada yang asal atau diolah semula hendaklah meletakkan kenyataan berikut:

“Sumber : Jabatan Perangkaan Malaysia”

No part of this publication may be reproduced or distributed in any form or by any means or stored in data base without the prior written permission from Department of Statistics Malaysia.

Users reproducing content of this publication with or without adaptation should quote the following:

“Source : *Department of Statistics Malaysia*”

ISSN 2805-492X



KATA PENGANTAR

Statistik Alam Sekitar, 2025 memaparkan statistik alam sekitar negeri Sarawak yang meliputi enam komponen iaitu Keadaan dan Kualiti Alam Sekitar; Sumber Alam Sekitar dan Kegunaannya; Sisa; Kejadian Ekstrem dan Bencana; Penempatan Penduduk dan Kesihatan Persekitaran; dan Penglibatan, Pengurusan dan Perlindungan Alam Sekitar. Penyusunan statistik ini meliputi maklumat dan keadaan alam sekitar, impak aktiviti manusia ke atas alam sekitar dan langkah yang diambil bagi mengurangkan impak tersebut.

Statistik alam sekitar ini boleh digunakan oleh agensi kerajaan negeri, sektor swasta, ahli akademik serta individu sebagai rujukan dalam menjalankan penyelidikan dan penganalisan di peringkat negeri. Rangka kerja yang digunakan dalam penerbitan ini adalah berdasarkan *Framework for the Development of Environment Statistics (FDES), United Nations, 2013*.

Penerbitan ini mengandungi enam bahagian. Bahagian pertama membentangkan infografik statistik alam sekitar, diikuti dengan ringkasan penemuan mengikut komponen di bahagian kedua serta kotak artikel di bahagian ketiga. Bahagian keempat pula memuatkan jadual terperinci mengenai statistik alam sekitar. Lampiran dan glosari disertakan di bahagian kelima dan keenam bagi membantu pengguna memahami statistik dan terma alam sekitar yang digunakan.

Jabatan merakamkan setinggi-tinggi penghargaan atas kerjasama dan sumbangan yang diberikan oleh semua pihak dalam menjayakan penerbitan ini. Setiap maklum balas dan cadangan untuk penambahbaikan penerbitan ini pada masa akan datang amatlah dihargai.

DATO' SRI DR. MOHD UZIR MAHIDIN

Ketua Perangkawan Malaysia

Disember 2025

PREFACE

Environment Statistics, 2025 presents the environment statistics of Sarawak which covers six components namely Environmental Conditions and Quality; Environmental Resources and their Use; Residuals; Extreme Events and Disasters; Human Settlements and Environmental Health; and Environmental Protection, Management and Engagement. The compilation of these statistics includes environment state and information, impacts of human activities on the environment and actions taken to minimise the impact.

These environment statistics can be used by state government agencies, private sectors, academicians and individuals as a reference to conduct research and analysis at the state level. The framework used in this publication is based on the Framework for the Development of Environment Statistics (FDES), United Nations, 2013.

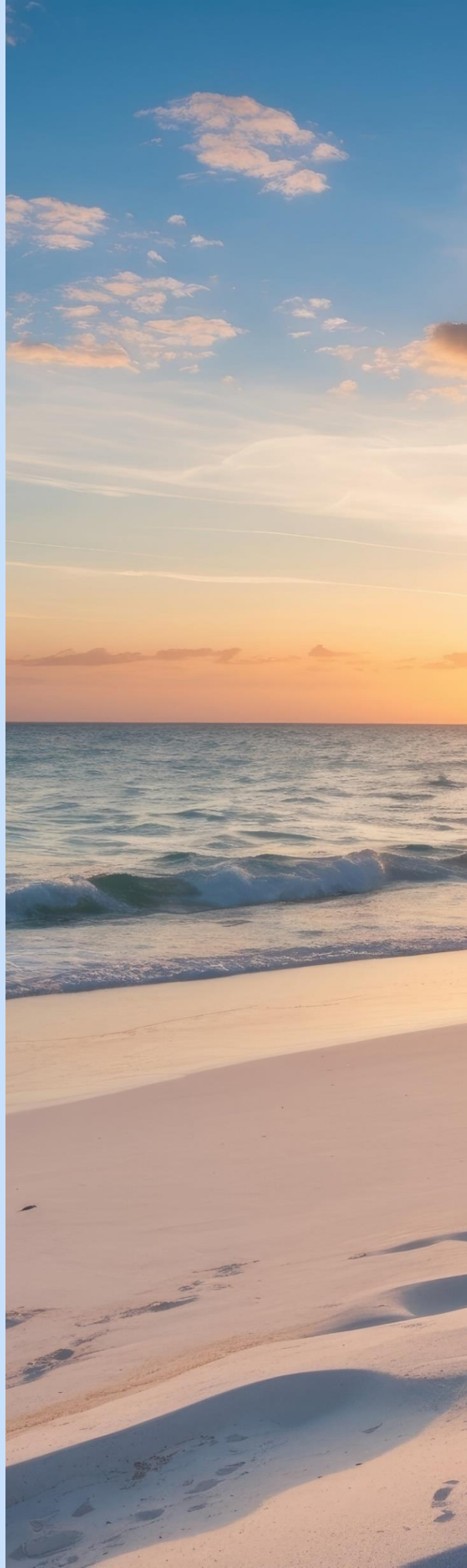
This publication consists of six parts. The first part focused on the infographics of environment statistics, followed by a summary of findings by component in the second part with the article box in the third part. The fourth part contains detailed tables on environment statistics. Appendices and glossary covered in the fifth and sixth parts are to facilitate users in understanding the statistics and environment terms used.

The Department gratefully acknowledges the co-operation and contribution rendered by all parties in making this publication a success. Every feedback and suggestion towards improving future publications is highly appreciated.

DATO' SRI DR. MOHD UZIR MAHIDIN

Chief Statistician Malaysia

December 2025





KANDUNGAN

CONTENT

Kata Pengantar	i
<i>Preface</i>	ii
Senarai Jadual	iv
<i>List of Tables</i>	
Senarai Lampiran	ix
<i>List of Appendices</i>	
Infografik	xiii
<i>Infographics</i>	xiv
Ringkasan Penemuan	3
<i>Summary of Findings</i>	14
Artikel	27
<i>Article</i>	31
Jadual Statistik	37
<i>Statistical Tables</i>	
Lampiran	83
<i>Appendices</i>	
Glosari	101
<i>Glossary</i>	

Jadual
Table

Muka Surat
Page

Komponen 1 Keadaan dan Kualiti Alam Sekitar
Component Environmental Conditions and Quality

1.1	Purata suhu, jumlah hujan dan purata kelembapan relatif, Sarawak, 2020-2024 <i>Mean temperature, total rainfall and mean relative humidity, Sarawak, 2020-2024</i>	37	1.10	Empangan dan kolam takungan di Sarawak <i>Dams and reservoirs in Sarawak</i>	42
1.2	Purata tekanan aras laut, kelajuan angin permukaan, sinaran global, penyejatan dan bilangan hari kilat, Sarawak, 2020-2024 <i>Mean sea level pressure, surface wind speed, global radiation, evaporation and number of days with lightning, Sarawak, 2020-2024</i>	38	1.11	Keluasan tanah mengikut daerah, Sarawak, 2025 <i>Land area by districts, Sarawak, 2025</i>	42
1.3	Purata bulanan tekanan aras laut, Sarawak, 2024 <i>Monthly mean sea level pressure, Sarawak, 2024</i>	39	1.12	Kawasan perlindungan sepenuhnya, Sarawak <i>Totally protected area, Sarawak</i>	44
1.4	Purata bulanan kelajuan angin permukaan, Sarawak, 2024 <i>Monthly mean surface wind speed, Sarawak, 2024</i>	39	1.13	Kawasan berhutan dan tidak berhutan, Sarawak, 2019-2022 <i>Forested and non-forested areas, Sarawak, 2019-2022</i>	48
1.5	Purata bulanan sinaran global, Sarawak, 2024 <i>Monthly mean global radiation, Sarawak, 2024</i>	39	1.14	Keluasan hutan simpanan kekal, Sarawak, 2019-2022 <i>Area of permanent reserved forest, Sarawak, 2019-2022</i>	48
1.6	Purata bulanan penyejatan, Sarawak, 2024 <i>Monthly mean evaporation, Sarawak, 2024</i>	39	1.15	Keluasan hutan paya gambut, Sarawak, 2019-2022 <i>Area of peat swamp forest, Sarawak, 2019-2022</i>	48
1.7	Bacaan maksimum harian Indeks Ultra Ungu (UV), Sib, 2024 <i>Daily maximum reading of the Ultra Violet (UV) Index, Sib, 2024</i>	40	1.16	Keluasan hutan paya laut, Sarawak, 2019-2022 <i>Area of mangrove forest, Sarawak, 2019-2022</i>	49
1.8	Senarai lembangan sungai utama di Sarawak <i>List of major river basins in Sarawak</i>	41	1.17	Status kualiti udara mengikut stesen, Sarawak, 2020-2024 <i>Air quality status by station, Sarawak, 2020-2024</i>	49
1.9	Panjang pesisiran pantai, Sarawak <i>Coastal length, Sarawak</i>	42	1.18	Bacaan minimum dan maksimum bulanan Indeks Pencemaran Udara (IPU), Sarawak, 2024 <i>Monthly minimum and maximum Air Pollutant Index (API), Sarawak, 2024</i>	51
			1.19	Purata tahunan kepekatan berdasarkan jenis bahan pencemar di udara, Sarawak, 2020-2024 <i>Annually average concentration based on the type of air pollutants in the air, Sarawak, 2020-2024</i>	52

Jadual Table		Muka Surat Page
1.20	Purata bulanan kepekatan Habuk Halus (PM_{2.5}) di udara, Sarawak, 2020-2024 <i>Monthly average concentration of Particulate Matter (PM_{2.5}) in the air, Sarawak, 2020-2024</i>	54
1.21	Purata bulanan kepekatan Habuk Halus (PM₁₀) di udara, Sarawak, 2020-2024 <i>Monthly average concentration of Particulate Matter (PM₁₀) in the air, Sarawak, 2020-2024</i>	55
1.22	Purata bulanan kepekatan Ozon Permukaan Bumi (O₃) di udara, Sarawak, 2020-2024 <i>Monthly average concentration of Ground Level Ozone (O₃) in the air, Sarawak, 2020-2024</i>	57
1.23	Purata bulanan kepekatan Karbon Monoksida (CO) di udara, Sarawak, 2020-2024 <i>Monthly average concentration of Carbon Monoxide (CO) in the air, Sarawak, 2020-2024</i>	58
1.24	Purata bulanan kepekatan Sulfur Dioksida (SO₂) di udara, Sarawak, 2020-2024 <i>Monthly average concentration of Sulphur Dioxide (SO₂) in the air, Sarawak, 2020-2024</i>	59
1.25	Purata bulanan kepekatan Nitrogen Dioksida (NO₂) di udara, Sarawak, 2020-2024 <i>Monthly average concentration of Nitrogen Dioxide (NO₂) in the air, Sarawak, 2020-2024</i>	60
1.26	Status kualiti air marin di kawasan pantai, muara sungai dan pulau berdasarkan Indeks Kualiti Air Marin, Sarawak, 2020-2024 <i>Status of marine water quality in coastal, estuary and island areas based on Marine Water Quality Index, Sarawak, 2020-2024</i>	61

Komponen 2 Sumber Alam Sekitar dan Kegunaannya

Component Environmental Resources and Their Use

2.1	Rizab minyak mentah dan kondensat, Sarawak, 2019-2023 <i>Reserves of crude oil and condensates, Sarawak, 2019-2023</i>	62	2.5	Pendaratan ikan laut, Sarawak, 2020-2024 <i>Landings of marine fish, Sarawak, 2020-2024</i>	63
2.2	Rizab gas asli, Sarawak, 2019-2023 <i>Reserves of natural gas, Sarawak, 2019-2023</i>	62	2.6	Bilangan ternakan, Sarawak, 2020-2024 <i>Number of livestock, Sarawak, 2020-2024</i>	63
2.3	Keluasan hutan yang dilesenkan pengusahaan, Sarawak, 2019-2023 <i>Forest area licensed for harvesting, Sarawak, 2019-2023</i>	62	2.7	Sembelihan ternakan yang direkod, Sarawak, 2019-2023 <i>Recorded slaughter of livestock, Sarawak, 2019-2023</i>	64
2.4	Pengeluaran produk kayu-kayan utama, Sarawak, 2019-2023 <i>Production of major timber products, Sarawak, 2019-2023</i>	63	2.8	Rekabentuk kapasiti loji rawatan air, Sarawak, 2020-2024 <i>Water treatment plants design capacity, Sarawak, 2020-2024</i>	64
			2.9	Pengeluaran air yang dibekalkan, Sarawak, 2020-2024 <i>Production of supplied water, Sarawak, 2020-2024</i>	64

Jadual Table		Muka Surat Page
2.10 Bekalan air mentah yang diabstrak dari sungai, empangan dan air bawah tanah, Sarawak, 2020-2024 <i>Supply of abstracted water from river, dams and groundwater, Sarawak, 2020-2024</i>	65	2.11 Penggunaan air mengikut sektor, Sarawak, 2020-2024 <i>Metered water consumption by sector, Sarawak, 2020-2024</i>

Komponen 3 Sisa Component Residuals

3.1 Senarai dan kapasiti kemudahan rawatan dan pelupusan sisa perbandaran, Sarawak, 2024 <i>List and capacity of municipal waste treatment and disposal facilities, Sarawak, 2024</i>	66	3.4 Kuantiti buangan klinikal, Sarawak, 2020-2024 <i>Quantity of clinical waste, Sarawak, 2020-2024</i>	68
3.2 Bilangan kemudahan rawatan dan pelupusan sisa perbandaran, Sarawak, 2024 <i>Number of municipal waste treatment and disposal facilities, Sarawak, 2024</i>	67	3.5 Bilangan tapak pelupusan sisa pepejal yang beroperasi, Sarawak, 2020-2024 <i>Number of operating solid waste landfills, Sarawak, 2020-2024</i>	68
3.3 Buangan terjadual, Sarawak, 2020-2024 <i>Scheduled waste, Sarawak, 2020-2024</i>	67		

Komponen 4 Kejadian Ekstrem dan Bencana Component Extreme Events and Disasters

4.1 Kejadian bencana Sarawak, 2020-2024 <i>Disaster events Sarawak, 2020-2024</i>	69	4.4 Bilangan kejadian kebakaran, Sarawak, 2020-2024 <i>Number of fire incidents, Sarawak, 2020-2024</i>	70
4.2 Bilangan kejadian banjir yang dilaporkan, Sarawak, 2020-2024 <i>Number of flood incidents reported, Sarawak, 2020-2024</i>	69	4.5 Bilangan kematian, kecederaan dan anggaran kerugian akibat kebakaran yang dilaporkan, Sarawak, 2020-2024 <i>Number of deaths, injuries and estimated losses caused by fire reported, Sarawak, 2020-2024</i>	70
4.3 Bilangan kemalangan jalan raya dan kecederaan yang dilaporkan, Sarawak, 2020-2024 <i>Number of road accidents and reported casualties reported, Sarawak, 2020-2024</i>	69	4.6 Statistik nilai kerugian banjir, Sarawak, 2022 dan 2023 <i>Statistics on value of flood losses, Sarawak, 2022 and 2023</i>	70

Jadual
Table

Muka Surat
Page

4.7	Taburan kawasan hakisan pantai, Sarawak, 2024	71
	<i>Distribution of coastal erosion areas, Sarawak, 2024</i>	

Komponen 5 Penempatan Penduduk dan Kesihatan Persekitaran

Component 5 Human Settlements and Environmental Health

5.1	Anggaran penduduk pertengahan tahun, Sarawak, 2021-2025	72	5.8	Penjanaan tenaga elektrik mengikut kawasan dan stesen, Sarawak, 2020-2024	76
	<i>Mid-year population estimates, Sarawak, 2021-2025</i>			<i>Electricity generated by region and station, Sarawak, 2020-2024</i>	
5.2	Kepadatan penduduk, Sarawak, 2021-2025	72	5.9	Bilangan ketibaan dan pelepasan kapal laut yang terlibat dalam perdagangan antarabangsa, Sarawak, 2019-2023	77
	<i>Population density, Sarawak, 2021-2025</i>			<i>Number of arrivals and departures of ocean-going vessel engaged in foreign trade, Sarawak, 2019-2023</i>	
5.3	Penduduk dengan air paip yang dirawat mengikut strata, Sarawak, 2021-2024	73	5.10	Kargo yang dikendalikan mengikut pelabuhan, Sarawak, 2020-2024	77
	<i>Population with treated piped water by strata, Sarawak, 2021-2024</i>			<i>Cargo throughput by port, Sarawak, 2020-2024</i>	
5.4	Kadar tarif air bgi domestik, Sarawak, 2024	73	5.11	Kadar insiden keracunan makanan, kolera dan tifoid, Sarawak, 2020-2024	78
	<i>Water tariff rates for domestic, Sarawak, 2024</i>			<i>Incidence rate of food poisoning, cholera and typhoid, Sarawak, 2020-2024</i>	
5.5	Kadar tarif air bgi industri, Sarawak, 2024	74	5.12	Bilangan kes demam denggi, demam denggi berdarah dan malaria, Sarawak, 2020-2024	78
	<i>Water tariff rates for industry, Sarawak, 2024</i>			<i>Number of dengue fever, dengue haemorrhagic fever and malaria cases, Sarawak, 2020-2024</i>	
5.6	Peratusan isi rumah dengan kemudahan bekalan elektrik mengikut strata, Sarawak, 2022	74			
	<i>Percentage of households with the accessibility to electricity supply by strata, Sarawak, 2022</i>				
5.7	Tarif elektrik, Sarawak	75			
	<i>Elektrik tariff, Sarawak</i>				

Jadual
Table

Muka Surat
Page

Komponen 6 Penglibatan, Pengurusan dan Perlindungan Alam Sekitar
Component Environmental Protection, Management and Engagement

6.1	Perbelanjaan perlindungan alam sekitar mengikut jenis perbelanjaan, Sarawak, 2018-2022	79	6.3	Pembangunan sumber hutan, Sarawak, 2019-2023	80
	<i>Environmental protection expenditure by type of expenditure, Sarawak, 2018-2022</i>			<i>Forest resource development, Sarawak, 2019-2023</i>	
6.2	Peruntukan dan perbelanjaan pembangunan hutan, Sarawak, 2019-2023	79			
	<i>Forest development allocation and expenditure, Sarawak, 2019-2023</i>				

Lampiran <i>Appendices</i>		Muka Surat <i>Page</i>
1	Framework for the Development of Environment Statistics (FDES) dan hubung kait dengan rangka kerja Daya Penggerak-Tekanan-Keadaan-Impak-Respon (DPSIR) <i>The FDES and its relationship with the Driving Force-Pressure-State-Impact-Response (DPSIR) framework</i>	83
2	Punca dan kesan bahan pencemar udara kepada manusia dan tumbuhan <i>Sources and effects of air pollutants on human and plants</i>	84
3	Perbandingan nilai IPU dengan tahap pencemaran dan kawalan kesihatan <i>Comparison of API values with the level of pollution and health measures</i>	85
4	Klasifikasi kualiti air berdasarkan Indeks Kualiti Air <i>Water quality classification based on Water Quality Index</i>	86
5	Klasifikasi Indeks Kualiti Air dan Kelas air dan kegunaan <i>Water Quality Index classification and Water classes and uses</i>	87
6	Standard dan kriteria kualiti air marin <i>Marine water quality criteria and standards</i>	88
7	Status kualiti air sungai mengikut stesen, Sarawak, 2020-2022 <i>Water quality status by stations, Sarawak, 2020-2022</i>	89
8A	Status kualiti air marin di kawasan pantai, Sarawak, 2020-2022 <i>Marine water quality status for coastal, Sarawak, 2020-2022</i>	93
8B	Status kualiti air marin di kawasan muara sungai, Sarawak, 2020-2022 <i>Marine water quality status for estuary, Sarawak, 2020-2022</i>	94
8C	Status kualiti air marin di kawasan pulau, Sarawak, 2020-2022 <i>Marine water quality status for island, Sarawak, 2020-2022</i>	95
9	Nota dan Simbol <i>Notes and Symbols</i>	96

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank



INFOGRAFIK

INFOGRAPHICS



Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank

STATISTIK ALAM SEKITAR, SARAWAK 2025



Hujan (mm)
2024: 2,953.2 – 5,624.0
2023: 2,522.7 – 5,213.6

Purata suhu minimum & maksimum (°C)
2024: 17.6 – 33.3
2023: 20.2– 32.8

Kejadian banjir
2024: 459
2023: 161

Tan metrik



Buangan terjadual
2024: 421,708
2023: 637,060

Buangan klinikal
2024: 5,002.3
2023: 4,951.4



Penduduk ('000)
2025^P : 2,529.8
2024 : 2,517.5

'000 tan metrik



Pendaratan ikan laut
2024: 96.1
2023: 94.3



Bilangan kes demam denggi
2024: 1,755
2023: 1,091

Bekalan air mentah
diabstrak (JLH)



Sungai
2024: 1,891
2023: 1,776

Empangan
2024: 232
2023: 298

Meter padu

Pengeluaran kayu balak
2023: 2,312,765
2022: 2,265,971

Pengeluaran kayu gergaji
2023: 255,533
2022: 266,057

Pengeluaran papan lapis
2023: 749,809
2022: 900,257



Hektar

Keluasan hutan yang dilesenkan untuk pengusahaan
2023: 58,518
2022: 44,823

Keluasan berhutan
2022: 7,638,499
2021: 7,645,454

Kejadian kebakaran (kes)
2024: 2,176
2023: 2,096

Nota:
p:awalan
JLH:Juta liter sehari





MINISTRY OF ECONOMY
DEPARTMENT OF STATISTICS MALAYSIA

ENVIRONMENT STATISTICS, SARAWAK 2025



Rainfall (mm)

2024: 2,953.2 – 5,624.0
2023: 2,522.7 – 5,213.6

Minimum & maximum mean temperature (°C)

2024: 17.6 – 33.3
2023: 20.2 – 32.8

Flood incidents

2024: 456
2023: 161

Metric tonnes



Scheduled wastes

2024: 421,708
2023: 637,060

Clinical wastes

2024: 5,002.3
2023: 4,951.4



Population ('000)

2025^p: 2,529.8
2024: 2,517.5

'000 metric tonnes



Landing of marine fish

2024: 96.1
2023: 94.3



Number of dengue fever cases

2024: 1,755
2023: 1,091

Supply of abstracted
raw water (MLD)



Rivers

2024: 1,891
2023: 1,776

Storage dams

2024: 232
2023: 298

Cubic metres

Log production

2023: 2,312,765
2022: 2,265,971

Sawn timber production

2023: 255,533
2022: 266,057

Plywood production

2023: 749,809
2022: 900,257



Hectares

Forest area licensed for harvesting

2023: 58,518
2022: 44,823

Forested area

2022: 7,638,499
2021: 7,645,454

Fire incidents (cases)

2024: 2,176
2023: 2,096

Notes:
MLD: Million litres per day
p: preliminary

xiv

Source: Environment Statistics, Sarawak, 2025
Department of Statistics Malaysia (DOSM)



@StatsMalaysia



20 October

2016 - 2030



RINGKASAN PENEMUAN

SUMMARY OF FINDINGS

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank

PENGENALAN

Kepentingan mewujudkan kestabilan alam sekitar harus menjadi tonggak asas kepada strategi pembangunan sesebuah negara. Ia merupakan agenda penting dan strategik dalam memastikan kesejahteraan berterusan masyarakat, bukan sahaja di dalam negara tetapi juga di peringkat global.

Beberapa kejadian akibat kemusnahan alam sekitar, seperti kejadian tanah runtuh tragis yang melibatkan kehilangan nyawa dan suhu yang melampau, memerlukan sebuah negara melaksanakan tindakan proaktif untuk mengurus persekitarannya dengan berhemah dan konsisten. Di samping pencapaian ekonomi, indikator alam sekitar bertindak sebagai kayu pengukur yang penting terhadap kesejahteraan dan kelestarian.

Sarawak mengalami pertumbuhan ekonomi yang memberangsangkan pada 2024, Keluaran Dalam Negara Kasar (KDNK) pada harga malar merekodkan RM148.2 bilion (2023: RM142.7 bilion), menunjukkan peningkatan 3.9 peratus daripada tahun sebelumnya. KDNK Sarawak menyumbang 9.0 peratus kepada keseluruhan KDNK Malaysia. Selain itu, KDNK per kapita pada harga semasa meningkat kepada RM73,444 berbanding RM72,283 pada 2023.

[Paparan 1.1]

Paparan 1.1: Ringkasan Ekonomi Negeri Sarawak, 2023 dan 2024

	2023 ^a	2024 ^p
KDNK pada harga malar 2015	RM142.7 bilion	RM148.2 bilion
Perubahan peratusan tahunan	1.3%	3.9%
Peratusan sumbangan kepada KDNK Malaysia	9.1%	9.0%
KDNK per kapita pada harga semasa	RM72,283	RM73,444

Nota: ^a anggaran
^p awalan



A. Kualiti alam sekitar

Bahan pencemar udara merupakan bahan kimia di udara yang boleh membahayakan manusia dan alam sekitar. Bahan pencemar boleh berbentuk zarah pepejal, titisan cecair atau gas. Terdapat enam bahan pencemar udara utama iaitu Ozon Permukaan Bumi (O_3), Karbon Monoksida (CO), Sulfur Dioksida (SO_2), Nitrogen Dioksida (NO_2) dan Habuk Halus (PM_{10} & $PM_{2.5}$). Pencemaran udara berlaku apabila bahan pencemar ini hadir di atmosfera. Punca dan kesan bahan pencemar udara ditunjukkan seperti di **Lampiran 2**.

Habuk Halus (PM_{10} & $PM_{2.5}$)

Habuk Halus (PM_{10} & $PM_{2.5}$) adalah istilah yang digunakan bagi zarah terampai berukuran kurang daripada diameter 10 dan 2.5 mikron. Zarah boleh berbentuk pepejal atau cecair dan ia termasuk aerosol, debu, asap dan debunga. Pembebasan PM_{10} dari ekzos kenderaan bermotor, penjanaan kuasa dan haba, proses perindustrian dan aktiviti pembakaran terbuka yang akan membawa kepada pencemaran udara serta mengancam kesihatan manusia dan tumbuhan.

Trend purata tahunan kepekatan $PM_{2.5}$ di Sarawak menunjukkan penurunan di semua stesen pada 2024. Manakala, kepekatan PM_{10} menurun di semua stesen kecuali di stesen Miri pada 2024 berbanding 2023. **[Paparan 1.2]**

Ozon Permukaan Bumi (O_3)

O_3 adalah bahan pencemar yang terjadi akibat daripada reaksi kimia dalam udara di antara sebatian organik (VOCs) dan nitrogen oksida (NO_x). VOCs dan NO_x ini dihasilkan oleh punca kenderaan bermotor dan industri.

Secara amnya, bacaan O_3 pada 2024 adalah kekal tidak berubah di stesen Bintulu dan Miri berbanding 2023 dan menurun di dua stesen iaitu stesen Kuching dan Sibul. **[Paparan 1.2]**



Karbon Monoksida (CO)

CO merupakan gas yang tidak berwarna, tidak berbau dan beracun yang dihasilkan dari punca pembakaran bahan bakar fosil seperti asap kenderaan, proses perindustrian dan aktiviti pembakaran terbuka.

Trend purata tahunan kepekatan CO pada 2024 menunjukkan peningkatan di stesen Bintulu dan Sibul. Manakala, stesen Kuching dan Miri mencatatkan penurunan berbanding 2023. **[Paparan 1.2]**



Sulfur Dioksida (SO₂)

SO₂ adalah sejenis gas reaktif yang mudah larut dalam air, tidak berwarna dan mempunyai bau yang tidak menyenangkan. SO₂ yang dilepaskan ke alam sekitar berasal daripada utiliti elektrik, terutamanya yang membakar arang batu. Beberapa sumber SO₂ lain termasuk kilang penapisan petroleum, pembuatan simen dan kemudahan peleburan dan pemprosesan logam. Pendedahan yang berlebihan

terhadap kepekatan tinggi SO₂ di udara menyebabkan kerosakan sistem pernafasan dan komplikasi kardiovaskular.

Trend purata tahunan kepekatan SO₂ pada 2024 kekal tidak berubah di semua stesen kecuali di stesen Samalaju yang mencatatkan peningkatan berbanding tahun sebelumnya.

[Paparan 1.2]

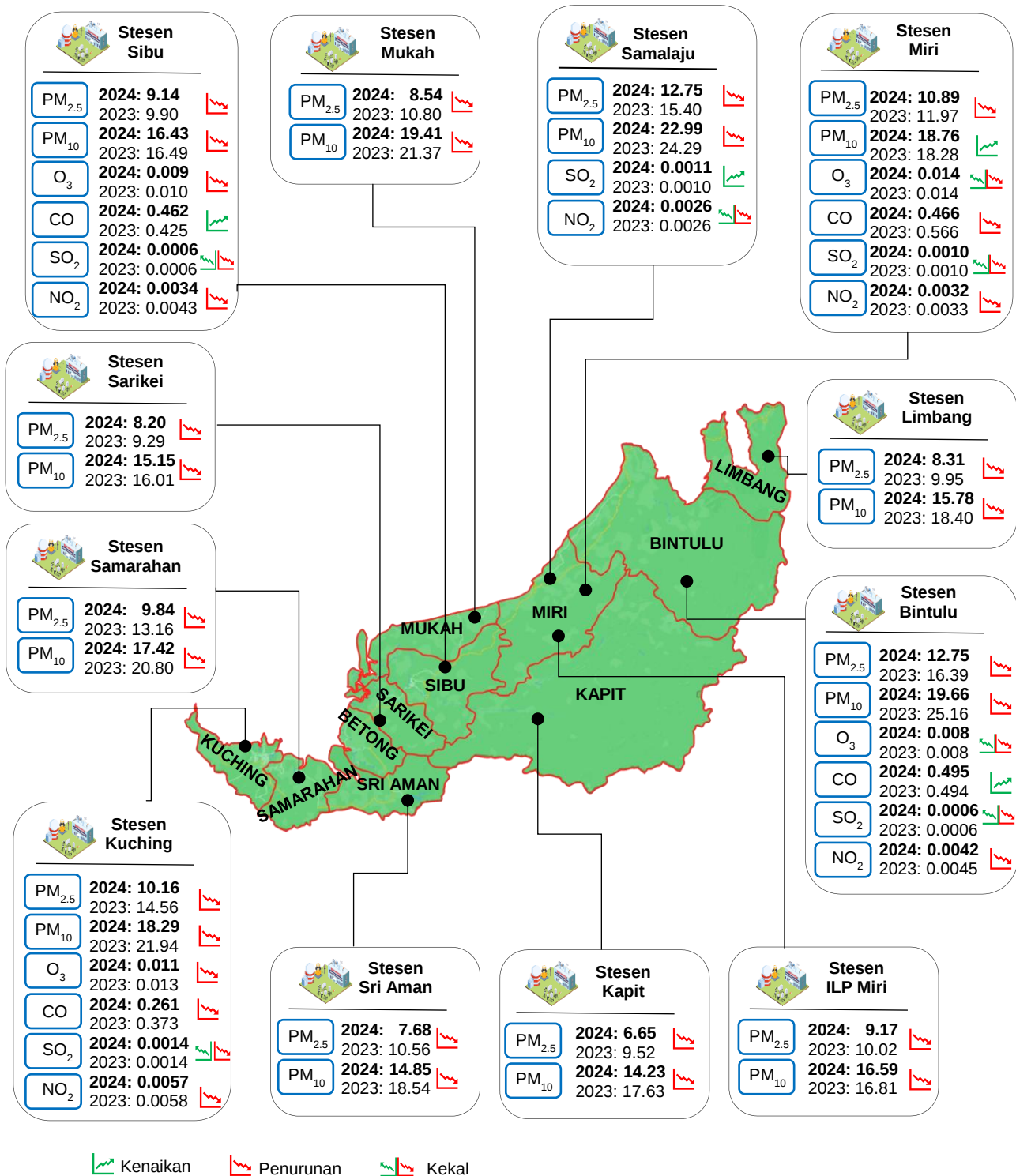
Nitrogen Dioksida (NO₂)

NO₂ terbentuk di persekitaran udara melalui pengoksidaan Nitrogen Monoksida (NO). Gas bertoksik ini berwarna merah keperangan dan mempunyai bau yang kuat dan tajam.

Trend purata tahunan kepekatan NO₂ pada 2024 menunjukkan penurunan di semua stesen kecuali di stesen Samalaju.

[Paparan 1.2]

Paparan 1.2: Ringkasan statistik bahan pencemar udara mengikut stesen, Sarawak, 2023 dan 2024



Sumber: Jabatan Alam Sekitar

B. Purata suhu, hujan dan purata kelembapan relatif

Iklim Malaysia dikategorikan sebagai iklim khatulistiwa yang mempunyai suhu seragam, hujan yang banyak dan lembap sepanjang tahun. Iklim ini dipengaruhi oleh monsun Timur Laut yang bertiup dari bulan November hingga Mac dan monsun Barat Daya dari Mei hingga September. Pantai timur Semenanjung Malaysia dan kawasan pesisiran pantai Sabah dan Sarawak amat dipengaruhi oleh musim monsun Timur Laut. Manakala, pantai barat Semenanjung Malaysia tidak dipengaruhi kerana dilindungi oleh banjaran gunung yang tinggi.

Sarawak mempunyai lapan stesen meteorologi yang digunakan untuk memantau keadaan cuaca secara berterusan dan menyediakan data meteorologi sebagai input untuk ramalan cuaca. Stesen-stesen tersebut adalah Kuching, Sibu, Miri, Bintulu, Limbang, Mulu, Kapit dan Sri Aman.

Purata suhu

Stesen Limbang mencatatkan purata suhu tertinggi iaitu 33.3°C, meningkat 0.5°C daripada 32.8°C pada 2023. Manakala, stesen Mulu merekodkan purata suhu terendah iaitu 17.6°C, berbanding yang direkodkan pada 2023 iaitu 20.2°C.

Taburan hujan

Stesen Kapit merekodkan hujan tahunan tertinggi pada 2024 iaitu 5,624.0 mm berbanding tahun sebelumnya (3,393.1 mm). Namun begitu, stesen Miri pula mencatatkan hujan tahunan terendah iaitu 2,953.2 mm pada 2024 berbanding 2023 (2,522.7 mm).

Purata kelembapan relatif

Purata kelembapan relatif di Sarawak adalah di antara 83.5 peratus (stesen Limbang) dan 86.5 peratus (stesen Sri Aman) pada 2024. Julat purata kelembapan relatif pada 2023 adalah antara 83.4 peratus (stesen Kuching) dan 87.4 peratus (stesen Bintulu).

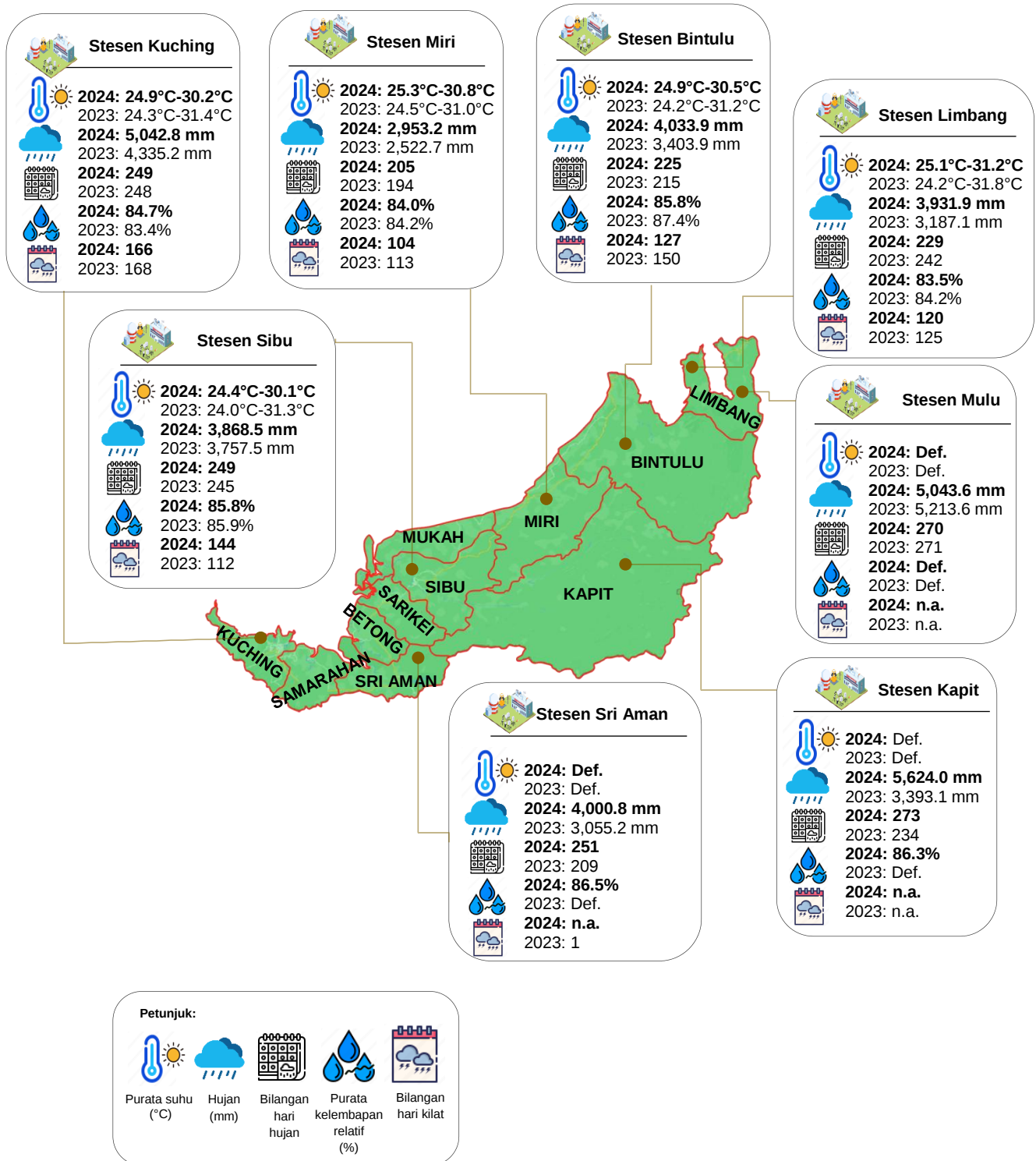
Bilangan hari kilat

Stesen Kuching mencatatkan bilangan hari kilat tertinggi pada 2024 iaitu 166 hari. Manakala, stesen Miri merekodkan bilangan hari kilat terendah iaitu 104 hari.

[Paparan 1.3]



Paparan 1.3: Ringkasan statistik iklim di stesen meteorologi, Sarawak, 2023 dan 2024



Sumber: Jabatan Meteorologi Malaysia

C. Status kualiti udara

Udara merupakan campuran beberapa gas yang membentuk atmosfera bumi. Ia terhasil terutamanya daripada nitrogen (lebih kurang 78.0%), oksigen (lebih kurang 21.0%) dan gas-gas lain (lebih kurang 1.0%). Udara amat penting dalam kehidupan di mana kita menggunakannya untuk bernafas dan juga untuk pembakaran bahan api bagi tujuan pemanasan, pengangkutan, penjanaan kuasa dan lain-lain.

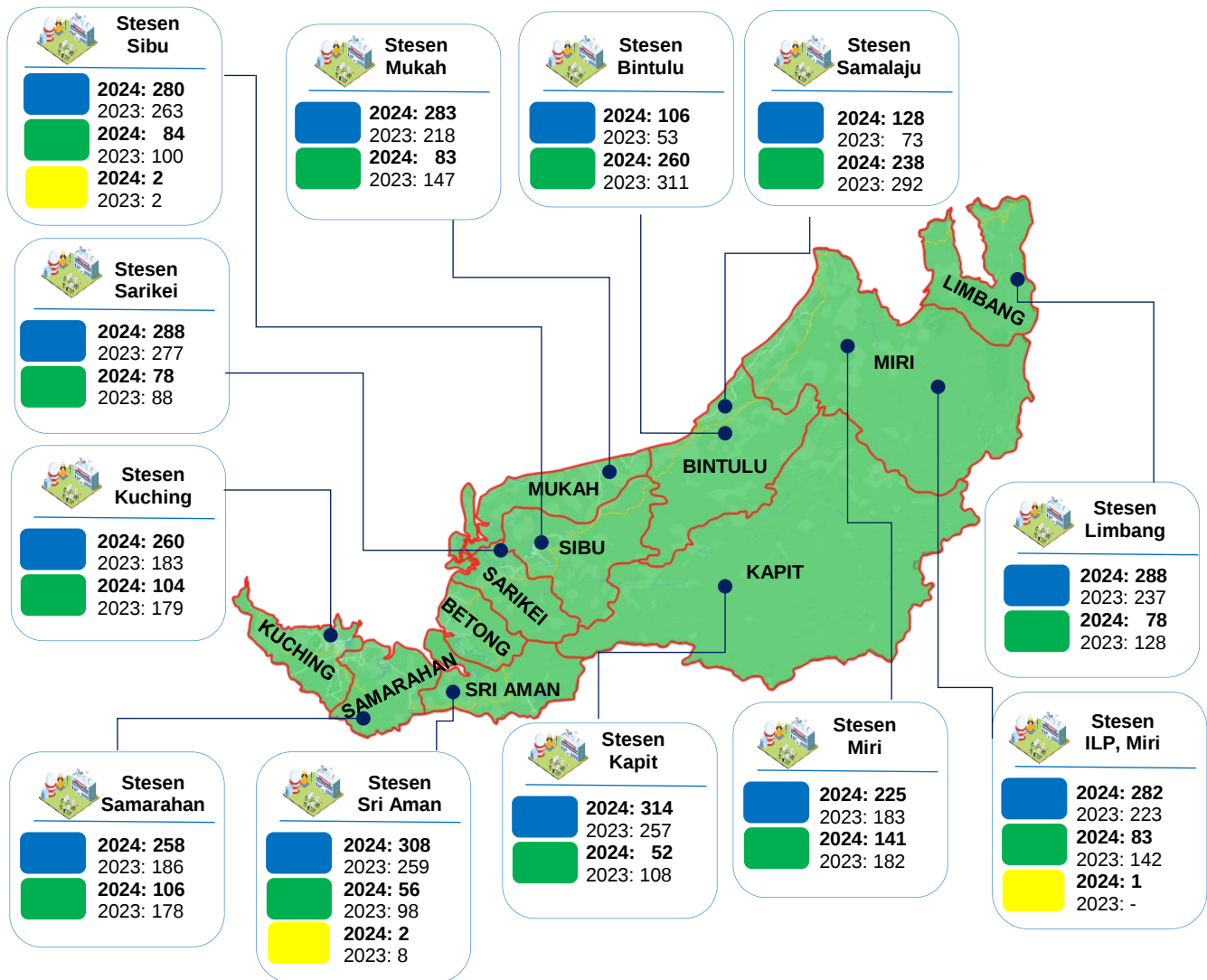
Indeks Pencemaran Udara

Jabatan Alam Sekitar (JAS) memantau kualiti udara negara melalui 65 stesen pengawasan yang ditempatkan di seluruh negara bagi mengawasi dan mengesan sebarang perubahan kualiti udara yang boleh memberi kesan negatif kepada kesihatan manusia dan alam sekitar. Status kualiti udara di Malaysia dilaporkan dalam Indeks Pencemaran Udara (IPU).

Bahan pencemar udara yang digunakan untuk mengira IPU adalah Ozon Permukaan Bumi (O_3), Karbon Monoksida (CO), Nitrogen Dioksida (NO_2), Sulfur Dioksida (SO_2) dan Habuk Halus bersaiz kurang dari 10 mikron (PM_{10}) dan bersaiz kurang dari 2.5 mikron ($PM_{2.5}$).

Semua stesen mencatatkan kualiti udara “baik” melebihi 100 hari pada 2024. Stesen Kapit mencatatkan bilangan hari tertinggi (314 hari) dengan kualiti udara “baik” berbanding 257 hari pada 2023. Bacaan IPU menunjukkan penurunan paras pencemar udara, khususnya di bandar-bandar utama di seluruh negeri disebabkan pelepasan bahan pencemar ke udara yang lebih rendah seperti asap kenderaan bermotor, pelepasan asap cerobong industri dan aktiviti pembakaran terbuka. **[Paparan 1.4]**

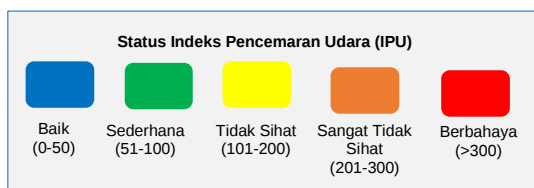
Paparan 1.4: Status kualiti udara mengikut stesen, Sarawak, 2023 and 2024



Nota:

1. Bacaan status kualiti udara berdasarkan bacaan maksimum harian
2. Stesen yang tidak mencukupi 365 hari adalah disebabkan masalah teknikal

Unit pengukuran: bilangan hari



Sumber: Jabatan Alam Sekitar

D. Hutan

Hutan adalah salah satu komponen penting dalam sistem biofizikal Malaysia. Iklim dan keadaan tanah yang sesuai menggalakkan pertumbuhan hutan hujan tropika, terutamanya spesies hutan tanah rendah dan hutan dipterokarpa bukit. Hutan dianggap sebagai penyaman udara yang besar, menapis hujan dan menghalang hakisan tanah yang teruk. Ia juga berperanan sebagai span besar yang menyerap, menyimpan dan menyalurkan kembali air dengan perlahan ke sungai serta laluan air. Hutan turut membekalkan produk balak serta menjadi gedung tanaman ubatan dan kawasan simpanan pelbagai biologi. Pengelasan hutan dikategorikan mengikut perubahan ciri-ciri altitud, komposisi flora, habitat, iklim, tanah dan biotik.

Kawasan berhutan

Kawasan berhutan diklasifikasikan sebagai hutan simpanan kekal, tanah kerajaan, taman hidupan liar dan hutan lain yang terdiri daripada beberapa jenis hutan seperti hutan darat, hutan paya gambut dan hutan paya laut.

Sarawak mempunyai kawasan berhutan dengan keluasan 7,638,499 hektar. Daripada jumlah ini, 3,939,113 hektar (51.6%) telah diwartakan sebagai Hutan Simpanan Kekal (HSK) di bawah Ordinan Hutan 2015 melalui Rang Undang-Undang Hutan (Pindaan) 2022. Kawasan HSK ini diuruskan di bawah prinsip pengurusan hutan secara berkekalan untuk kepentingan ekonomi, sosial dan alam sekitar. [Paparan 1.5]

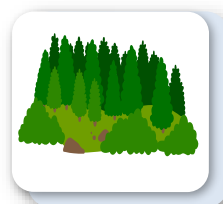
Pengusahasaan hutan

Aktiviti pengusahasaan hutan merujuk kepada pengambilan dan pengeluaran hasil hutan dan seterusnya menyumbang kepada

perkembangan dan pertumbuhan sosio ekonomi. Aktiviti pengusahasaan hutan dikawal melalui perundangan, dasar dan garis panduan pengoperasian. Keluasan hutan yang dilesenkan untuk pengusahasaan bagi negeri Sarawak meningkat kepada 58,518 hektar pada 2023 daripada 44,823 hektar pada 2022. [Paparan 1.6]

Paparan 1.5: Kawasan berhutan dan Hutan Simpanan Kekal, Sarawak, 2021 dan 2022

(Hektar)



Kawasan berhutan

2022: 7,638,499
2021: 7,645,454



Hutan Simpanan Kekal

2022: 3,939,113
2021: 3,939,113

Sumber: Jabatan Hutan Sarawak

Paparan 1.6: Keluasan hutan yang dilesenkan untuk pengusahaan, Sarawak, 2022 dan 2023

(Hektar)



2023: 58,518
2022: 44,823

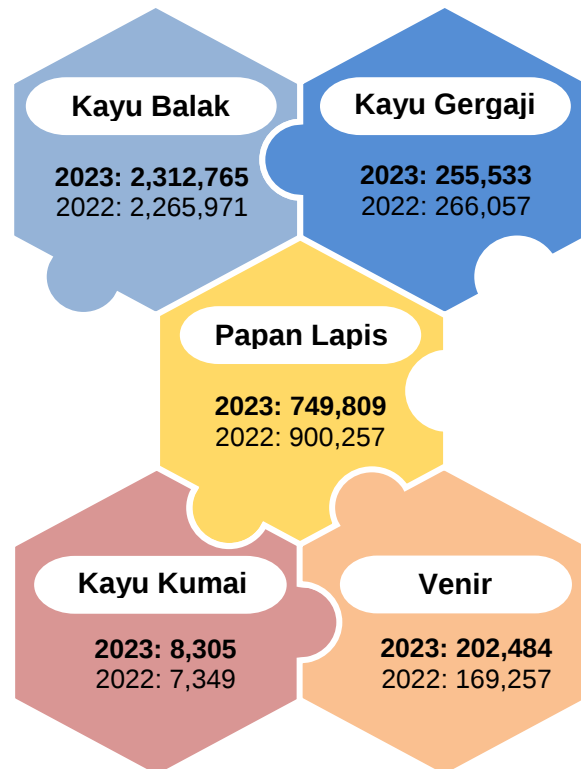
Sumber: Jabatan Hutan Sarawak



Kayu balak merupakan salah satu produk kayu-kayan utama di Sarawak. Pengeluaran kayu balak yang direkodkan pada 2023 meningkat kepada 2,312,765 m³ berbanding 2,265,971 m³ pada 2022. **[Paparan 1.7]**

Paparan 1.7: Pengeluaran produk kayu kayan utama, Sarawak, 2022 dan 2023

(Meter padu)



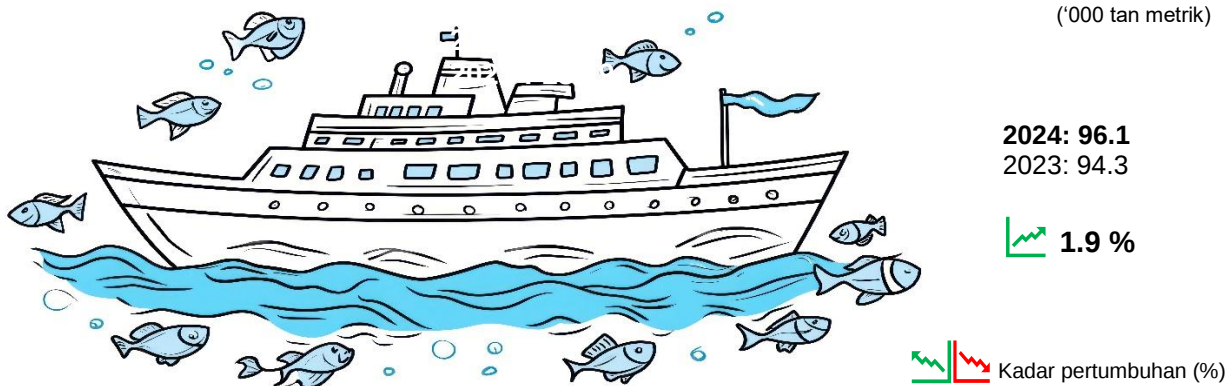
Sumber: Jabatan Hutan Sarawak

E. Sumber biologi

Laut Malaysia adalah antara perairan yang mempunyai kepelbagaian biologi di dunia, dengan pelbagai jenis ekosistem dan sumber semula jadi yang penting kepada kehidupan dan keperluan pemakanan manusia.

Pendaratan ikan laut pada 2024 ialah 96.1 ribu tan metrik meningkat 1.9 peratus berbanding 94.3 ribu tan metrik pada 2023. **[Paparan 1.8]**

Paparan 1.8: Pendaratan ikan laut, Sarawak, 2023 dan 2024



Sumber: Jabatan Perikanan Malaysia

F. Buangan klinikal

Buangan klinikal pula merujuk kepada buangan yang terdiri daripada keseluruhan atau sebahagian tisu manusia, darah atau bendalir badan, bahan kumuh, ubat-ubatan, produk farmaseutikal dan lain-lain. Ia diklasifikasikan sebagai buangan terjadual di

bawah Jadual Pertama Peraturan Kualiti Alam Sekeliling (Buangan Terjadual), 2005.

Sarawak mencatatkan 5,002.3 tan metrik buangan klinikal pada 2024 berbanding 4,951.4 tan metrik yang direkodkan pada 2023. **[Paparan 1.9]**

Paparan 1.9: Kuantiti buangan klinikal, Sarawak, 2023 dan 2024

(Tan metrik)



INTRODUCTION

The importance of establishing environmental stability should be a fundamental pillar of a country's development strategy. It's a crucial and strategic agenda in ensuring continuous well-being of the community, not only within the nation but also globally.

Several events resulting from environmental destruction, such as tragic landslide incidents involving lost of lives and extreme temperatures, necessitate that a country implements proactive action to manage its environment with prudence and consistency. Aside from economic achievement, environment indicator serves as an important measurement towards well-being and sustainability.

*Sarawak experienced favourable economic growth in 2024, Gross Domestic Product (GDP) at constant prices recorded RM148.2 billion (2023: RM142.7 billion), indicating a 3.9 per cent increase from the previous year. Sarawak's GDP contributes 9.0 per cent to Malaysia's overall GDP. Additionally, the GDP per capita at current prices rose to RM73,444 as compared to RM72,283 in 2023. **[Exhibit 1.1]***

Exhibit 1.1: Economic Summary of Sarawak, 2023 and 2024

	2023 ^e	2024 ^p
GDP at constant price 2015	RM142.7 billion	RM148.2 billion
Annual Percentage change	1.3%	3.9%
Percentage contribution to Malaysia's GDP	9.1%	9.0%
GDP per capita at current price	RM72,283	RM73,444

Notes: ^e estimates
^p preliminary



A. Environmental quality

Air pollutants are chemical substances in the air that can be harmful to human beings and the environment. Pollutants can be in the form of solid particles, liquid droplets or gases. There are six primary pollutants namely Ground Level Ozone (O_3), Carbon Monoxide (CO), Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10} & $PM_{2.5}$). Air pollution occurs when these pollutants are present in the atmosphere. The sources and effects of air pollutants are shown in **Appendix 2**.

Particulate Matter (PM_{10} & $PM_{2.5}$)

Particulate Matter (PM_{10} & $PM_{2.5}$) is the term used to describe respirable particles of less than 10 and 2.5 microns in diameter. Particles may be solid or liquid and include aerosol, dust, smoke and pollen. Emission of PM_{10} from motor vehicle exhausts, heat and power generation, industrial processes and open burning activities will lead to air pollution and endanger human health and plants.

The annual average trend concentration of $PM_{2.5}$ in Sarawak showed a decreased at all stations in 2024. Meanwhile, PM_{10} concentration decreased at all stations except at Miri station in 2024 as compared to 2023

[Exhibit 1.2]

Ground Level Ozone (O_3)

O_3 is a pollutant formed by the chemical reaction in the air between volatile organic compounds (VOCs) and nitrogen oxide (NO_x). These VOCs and NO_x are produced by motor vehicles and industrial sources.

In general, O_3 readings in 2024 remained unchanged at Bintulu and Miri stations as compared to 2023 and decrease in two stations namely Kuching and Sibul stations.

[Exhibit 1.2]



Carbon Monoxide (CO)

CO is a colourless, odourless and toxic gas produced from fossil fuel combustion sources such as vehicle exhaust, industrial processes and open burning activities.

The annual average trend concentration of CO in 2024 showed an increase Bintulu and Sibu stations. Meanwhile, Kuching and Miri stations recorded a decrease as compared to 2023. **[Exhibit 1.2]**



Sulphur Dioxide (SO₂)

SO₂ is a colourless, water-soluble reactive gas with an unpleasant odour. SO₂ released into the environment comes from electric utilities, especially those that burn coal. Some other sources of SO₂ include petroleum refineries, cement manufacturing and metal smelting and processing facilities. Excessive exposure to high concentration of SO₂ in the atmosphere causes respiratory illnesses and cardiovascular complications.

The annual average trend concentration of SO₂ in 2024 remain unchanged at all stations except at Samalaju station that recorded an increase as compared to the previous year.

[Exhibit 1.2]

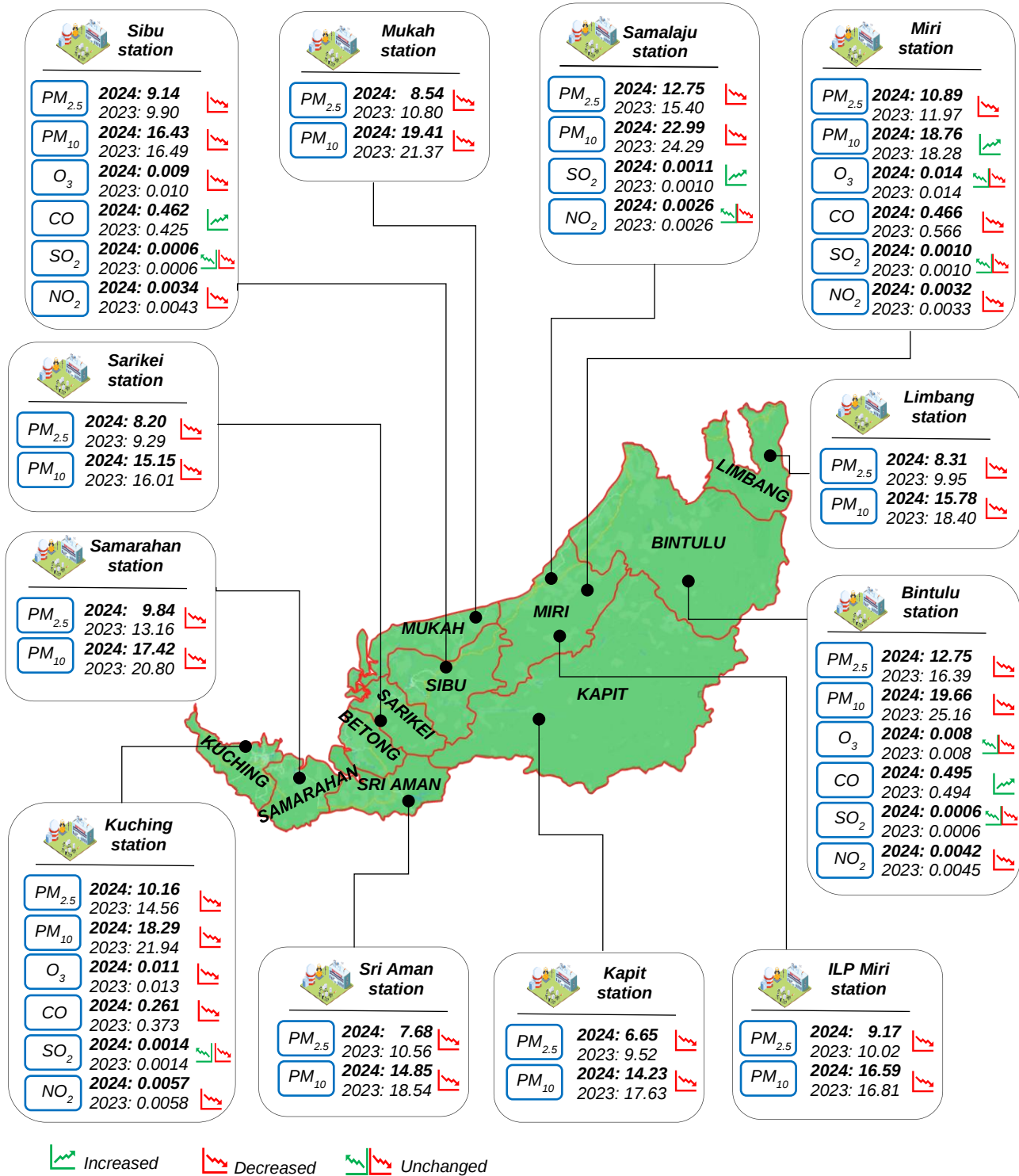
Nitrogen Dioxide (NO₂)

NO₂ is formed in the ambient air through the oxidation of Nitrogen Monoxide (NO). This reddish-brown toxic gas has a sharp and pungent odour.

The annual average trend concentration of NO₂ in 2024 showed a decreased at all stations except at Samalaju station.

[Exhibit 1.2]

Exhibit 1.2: Summary of air pollutants statistics by station, Sarawak, 2023 and 2024



Source: Department of Environment

B. Mean temperature, rainfall and mean relative humidity

Malaysia's climate is categorised as equatorial, has a uniform temperature, copious rainfall and humid throughout the year. This climate is influenced by the Northeast monsoon blows from November to March and the Southwest monsoon from May to September. The east coast of Peninsular Malaysia and the coastal areas of Sabah and Sarawak are strongly influenced by the Northeast monsoon season. However, the west coast of Peninsular Malaysia is not affected because it is protected by the soaring mountain ranges.

Sarawak has eight meteorological stations which used to monitor the weather conditions continuously and provide meteorological data as an input for weather forecasting. The stations are Kuching, Sibul, Miri, Bintulu, Limbang, Mulu, Kapit and Sri Aman.

Mean temperature

Limbang station recorded the highest mean temperature of 33.3°C, an increase of 0.5°C compared to 32.8°C in 2023. Meanwhile, Mulu station recorded the lowest mean temperature of 17.6°C, as compared to that recorded in 2023 which was 20.2°C.

Rainfall distribution

Kapit station recorded the highest annual rainfall in 2024 which was 5,624.0 mm as compared to the previous year (3,393.1 mm). However, Miri station recorded the lowest annual rainfall of 2,953.2 mm in 2024 as compared to 2023 (2,522.7 mm).

Mean relative humidity

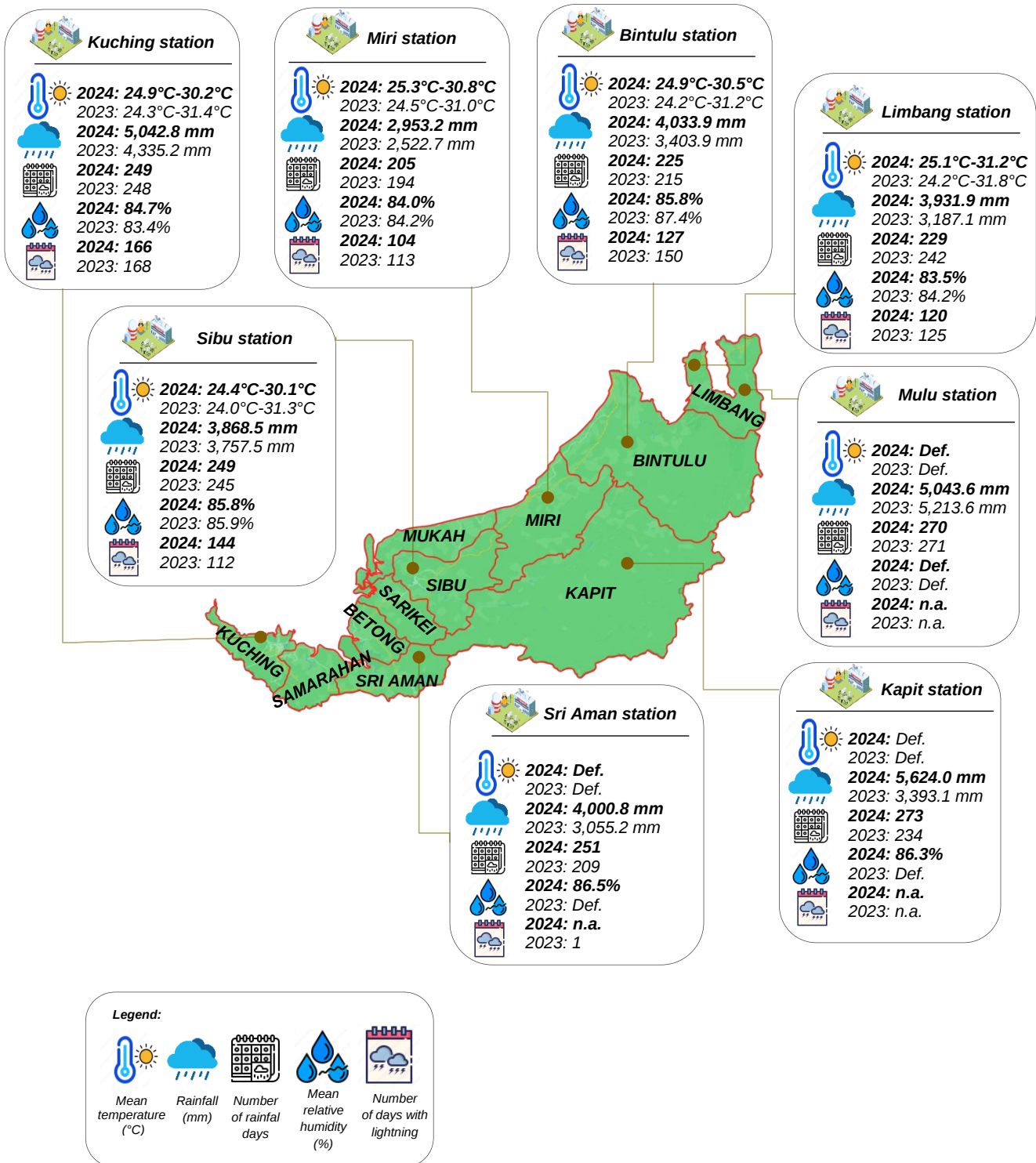
The mean relative humidity in Sarawak was between 83.5 per cent (Limbang station) and 86.5 per cent (Sri Aman station) in 2024. The mean relative humidity range in 2023 was between 83.4 per cent (Kuching station) and 87.4 per cent (Bintulu station).

Number of days with lightning

Kuching station recorded the highest number of days with lightning in 2024 which was 166 days. Meanwhile, Miri station recorded the lowest number of days with lightning which was 104 days. **[Exhibit 1.3]**



Exhibit 1.3: Summary of climate statistics at meteorological stations, Sarawak, 2023 and 2024



Source: Malaysia Meteorological Department

C. Air Quality Status

Air is the mixture of gases which make up the earth's atmosphere. It is mainly composed of nitrogen (about 78.0%), oxygen (about 21.0%) and other gases (about 1.0%). Air is essential for life for breathing as well as to burn fuels for heating, transportation, power generation and others.

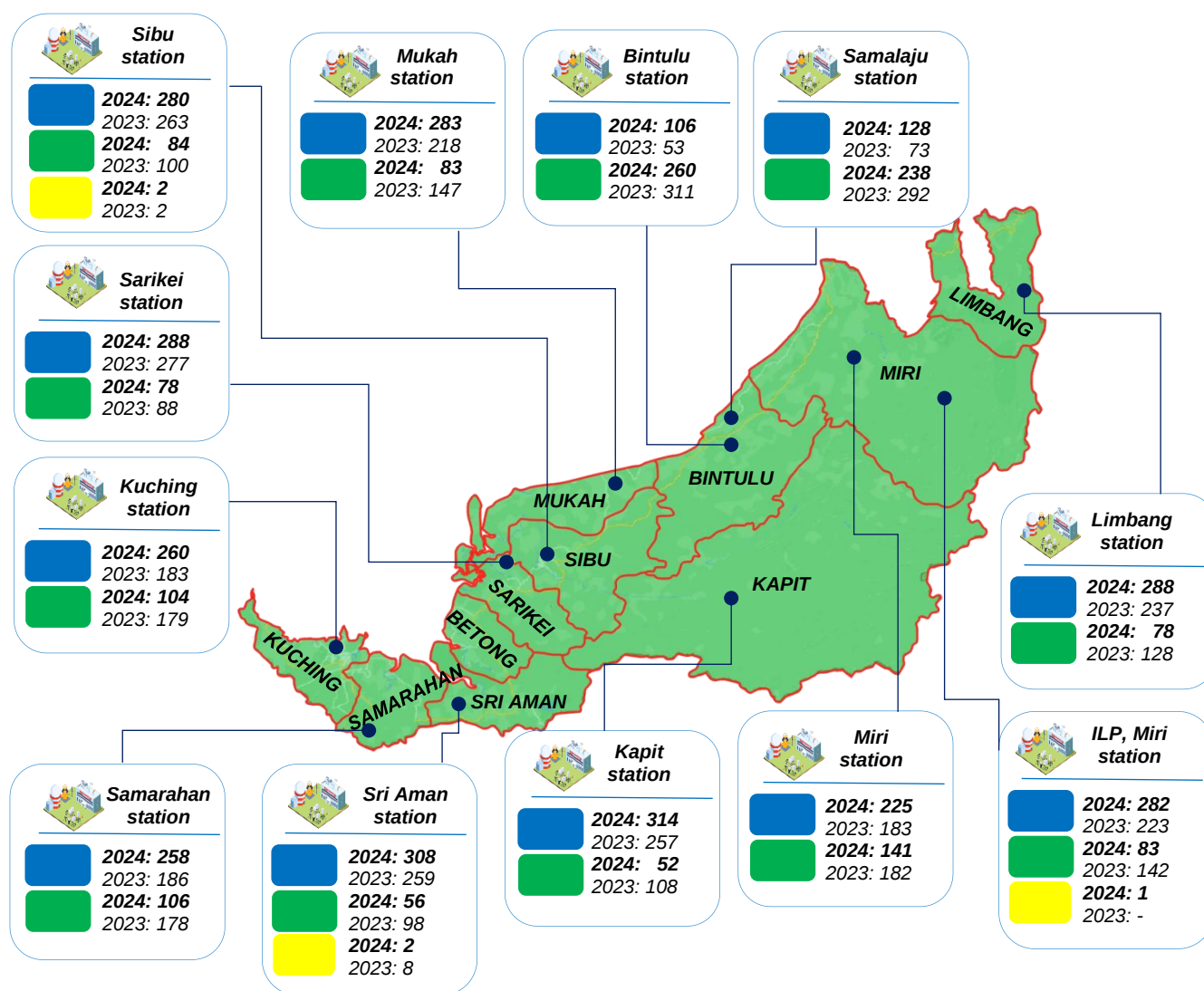
The Department of Environment (DOE) monitors the country's ambient air quality through 65 monitoring stations that are located throughout the country to monitor and detect any significant change in the air quality that can contribute to the negative impact on human health and environment. The status of air quality in Malaysia is reported as the Air Pollutant Index (API).

Air Pollutant Index

The air pollutants used in computing the API are Ground Level Ozone (O₃), Carbon Monoxide (CO), Nitrogen Dioxide (NO₂) Sulphur Dioxide (SO₂), Particulate Matter of less than 10 microns in size (PM₁₀) and Particulate Matter of less than 2.5 microns in size (PM_{2.5}).

*All stations registered more than 100 days of "good" air quality in 2024. Kapit station registered the highest number of days (314 days) with "good" air quality as compared to 257 days in 2023. API reading showed a decrease in air pollutants levels, especially in major cities across the state due to lower air pollutant emissions such as motor vehicles smoke, industrial chimney emissions and open burning activities. **[Exhibit 1.4]***

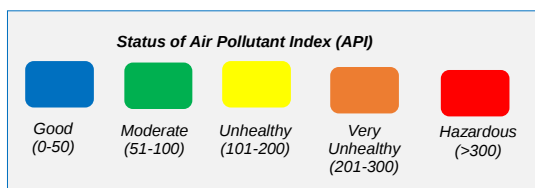
Exhibit 1.4: Status of air quality by station, Sarawak, 2023 and 2024



Notes:

1. Air quality status readings are based on daily maximum readings
2. Stations with inadequate 365 days is due to technical problem

Measurement unit: number of days



Source: Department of Environment

D. Forest

Forests are one of the important components in Malaysia's biophysical system. Suitable climate and soil conditions encourage the growth of tropical rainforests, especially lowland forest species and hill dipterocarp forests. Forests are considered a large air filters, filtering rain and preventing severe soil erosion. It also acts as a large sponge that absorbs, stores and slowly returns water to rivers and waterways. Forests also supply timber products as well as being a storehouse of medicinal plants and storage areas for various biology. Forest classification is categorised according to changes in altitude, flora composition, habitat, climate, soil and biotic characteristics.

Forested area

Forested areas are classified as a permanent reserve forests, government land, wildlife parks and other forests consisting of several types such as terrestrial forests, peat swamp forests and marine swamp forests.

Sarawak has a forested area of 7,638,499 hectares. Of this total, 3,939,113 hectares (51.6%) have been gazetted as Permanent Forest Reserve (PFR) under Forest Ordinance 2015 through the Forest (Amendment) Bill 2022. These PFR areas are managed under the principle of sustainable forest management for economic, social and environmental benefits. **[Exhibit 1.5]**

Forestry production

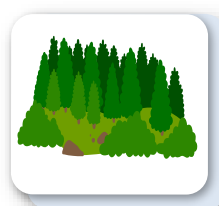
Forest exploitation activities refer to the collection and production of forest products and further contribute to the development and socio-economic growth. Forest exploitation activities are regulated through legislation, policies and operating guidelines. The area of forest licensed for logging for the state of

Sarawak increased to 58,518 hectares in 2023 from 44,823 hectares in 2022.

[Exhibit 1.6]

Exhibit 1.5: Forested and Permanent Reserve Forest, Sarawak, 2021 and 2022

(Hectares)



Forested area

2022: 7,638,499
2021: 7,645,454



Permanent Reserve Forest

2022: 3,939,113
2021: 3,939,113

Exhibit 1.6: Forest area licensed for harvesting, Sarawak, 2022 and 2023

(Hectares)



2023: 58,518
2022: 44,823

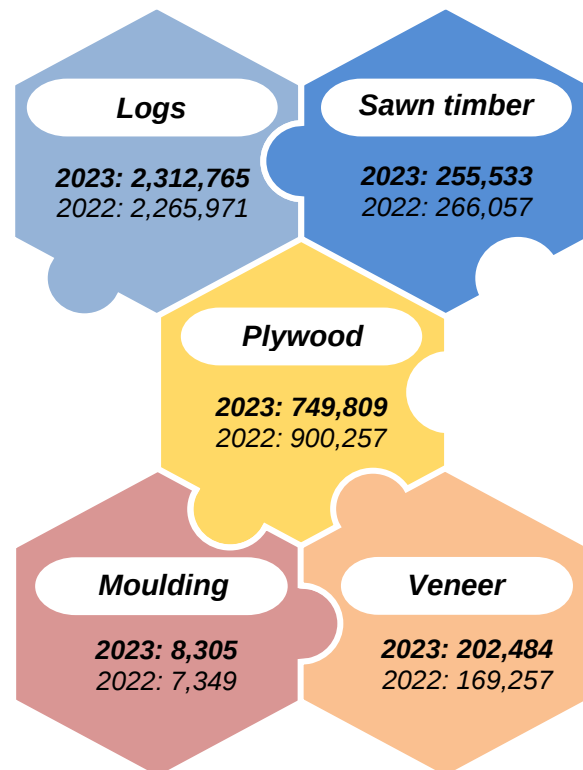
Source: Forest Department Sarawak

Logs is one of the main timber products in Sarawak. Logs production recorded in 2023 increased to 2,312,765 m³ as compared to 2,265,971 m³ in 2022. **[Exhibit 1.7]**



Exhibit 1.7: Production of major timber products, Sarawak, 2022 and 2023

(Cubic metres)



Source: Forest Department Sarawak

E. Biological resources

Malaysia's sea are among the most biologically diversified in the world, with a variety of ecosystems and natural resources which are important to the livelihood and sustenance to human.

The landing of marine fish in 2024 was 96.1 thousand metric tonnes, decreased 1.9 per cent as compared to 94.3 thousand metric tonnes in 2023. **[Exhibit 1.8]**

Exhibit 1.8: Landings of marine fish, Sarawak, 2023 and 2024

('000 metric tonnes)



2024: 96.1
2023: 94.3

1.9 %

Growth rate (%)

Source: Department of Fisheries

F. Clinical wastes

Clinical wastes refers to any wastes which consists wholly or partly of human tissues, blood or body fluids, excretions, drugs or pharmaceutical products and others. It is classified as scheduled wastes under the First Schedule Environmental Quality (Scheduled Wastes) Regulations, 2005.

Sarawak recorded 5,002.3 metric tonnes of clinical wastes in 2024 as compared to 4,951.4 metric tonnes recorded in 2023.

[Exhibit 1.9]

Exhibit 1.9: Quantity of clinical wastes, Sarawak, 2023 and 2024

(Metric tonnes)

Clinical wastes

2024: 5,002.3
2023: 4,951.4

1.0 %

Growth rate (%)



Source: Department of Environment



ARTIKEL

ARTICLE

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank

Implikasi Cuaca kepada Pengeluaran Sayur-sayuran di Sarawak

Siti Nur Syafiqah Mohd Zulkiflee, Syed Ibrahim Mohd Jamaluddin, Latifah Mohamed Shah

Sektor pertanian Malaysia menjadi teras dalam kestabilan bekalan makanan dan antara komponen penting dalam ekonomi negara, sektor ini beroperasi dalam iklim khatulistiwa yang sebelum ini mempunyai pola cuaca yang relatif konsisten dan dapat dijangka. Walaupun keadaan ini secara umumnya sesuai untuk aktiviti pertanian, perubahan cuaca dan corak cuaca yang tidak menentu sejak kebelakangan ini memberi kesan besar terhadap pengeluaran hasil pertanian, terutamanya sayur-sayuran. Malaysia yang jelas mempunyai iklim tropika lembap, dengan hujan sepanjang tahun dan monsun menawarkan potensi yang baik untuk pertanian sayur-sayuran. Secara purata, Malaysia mendapat hujan tahunan sekitar 2,000 – 2,500 milimeter (mm) sehari atau lebih dan suhu yang hampir seragam sepanjang tahun¹. Selain itu, cuaca di Malaysia juga turut dipengaruhi besar oleh dua monsun utama iaitu Monsun Timur Laut (November – Mac) yang membawa hujan lebat di sepanjang pantai timur Semenanjung Malaysia dan Monsun barat Daya (Mei – September) yang lebih kering bagi beberapa kawasan. Secara ringkas, keadaan cuaca yang lembap dan stabil serta wujud musim hujan dan tempoh yang agak kering, semua ini memberi implikasi signifikan kepada sektor pertanian sayur-sayuran di Malaysia.

Hujan lebat dan banjir merupakan antara faktor cuaca utama yang boleh memberi kesan serius terhadap pengeluaran sayur-sayuran di Malaysia. Walaupun air hujan diperlukan untuk pertumbuhan tanaman, jumlah yang berlebihan boleh membawa pelbagai implikasi negatif kepada kesihatan tanah, sistem akar dan hasil tanaman. Malaysia sering mengalami musim hujan yang tidak menentu terutamanya semasa Monsun Timur Laut. Hujan lebat yang berterusan boleh menyebabkan banjir kilat di kawasan rendah dan merosakkan tanaman akibat tanah yang terlalu lembap menyebabkan akar sayur mudah reput, manakala nutrien yang tidak dapat diserap oleh pokok akan larut dan hilang bersama air hujan². Kesan dari situasi ini, harga sayuran akan melonjak naik sehingga 100 peratus susulan pengeluaran hasil sayuran yang terjejas teruk dan mengalami kekurangan bekalan³.

Pada 2023, cuaca panas yang melanda negara sejak Mei berlanjutan sehingga Ogos ekoran perubahan kitaran musim kepada Monsun barat Daya¹. Fenomena El Niño berlaku apabila suhu permukaan laut di kawasan Lautan Pasifik Khatulistiwa meningkat melebihi 0.5 darjah Celsius daripada purata jangka panjang¹. Di Malaysia, kesan El Niño lazimnya membawa

¹ Jabatan Meteorologi Malaysia

² <https://agrimag.my/bm/article-details/kesan-pokok-apabila-hujan-berlebihan>

³ www.bharian.com.my/hujan-lebat-punca-harga-makanan-meningkat

kepada cuaca panas dan kering berpanjangan, pengurangan taburan hujan, serta penurunan kelembapan tanah yang boleh menjejaskan pertumbuhan tanaman seperti padi dan sayur-sayuran. Walaupun tidak semua jenis tanaman sayur-sayuran terjejas akibat cuaca panas, namun apabila suhu meningkat sehingga mencecah 40 darjah Celsius, keadaan tersebut tanpa ragu akan memberikan impak negatif terhadap aktiviti pertanian secara keseluruhan⁴. Cuaca panas yang melampau boleh menjejaskan pertumbuhan optimum tanaman, sekali gus menurunkan kualiti sayur-sayuran yang dihasilkan dan seterusnya mendorong kepada peningkatan harga di pasaran⁵.

Jumlah taburan hujan di Sarawak menurun antara tahun 2022 dan 2023. Pada tahun 2022, jumlah hujan yang direkodkan adalah sebanyak 4,191.0 mm, manakala pada tahun 2023 ia menurun kepada 3,608.5 mm¹. Penurunan sebanyak 13.9 peratus ini menunjukkan keadaan cuaca yang kering di Sarawak. Namun pengeluaran sayur-sayuran di Sarawak kekal positif walaupun menerima hujan yang kurang pada 2023, pengeluaran sayur-sayuran di Sarawak pada 2023 merekodkan sebanyak 63,350 tan metrik berbanding 53,191 tan metrik pada 2022⁶ dengan peningkatan sebanyak 19.1 peratus. Situasi ini selari dengan dapatan Keluaran Dalam Negara Kasar (KDNK) pada harga malar 2015 sayur-sayuran yang mencatatkan sebanyak RM13,148 juta dengan kadar pertumbuhan yang sederhana iaitu 0.2 peratus. Namun, pada tahun 2023, KDNK pada harga malar 2015 sayur-sayuran meningkat kepada RM13,842 juta, disertai pertumbuhan yang lebih kukuh sebanyak 5.3 peratus⁷.

¹ Jabatan Meteorologi Malaysia

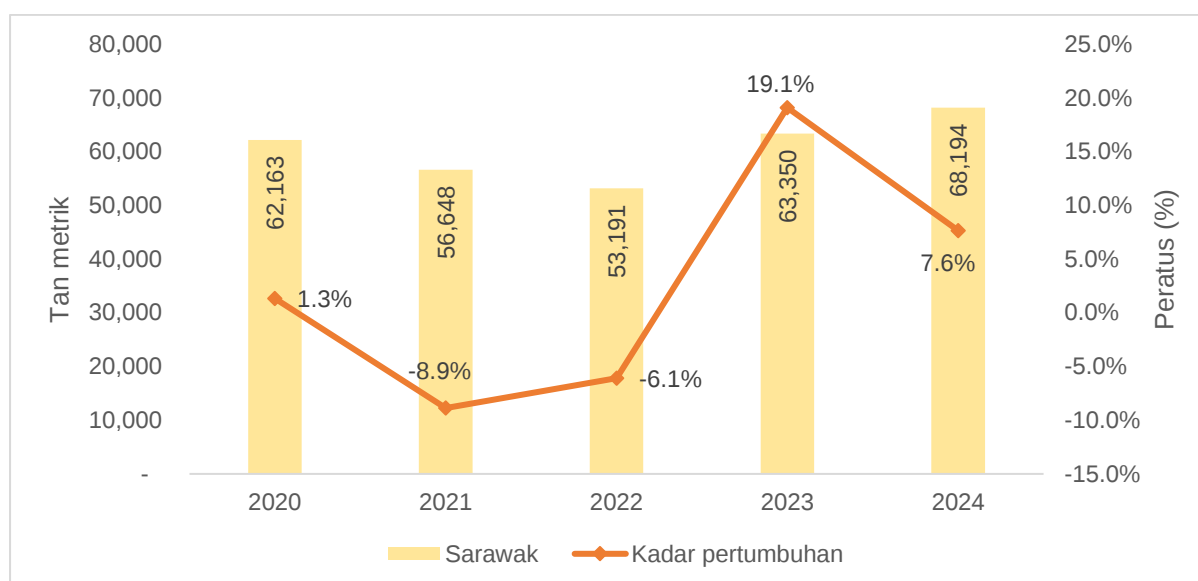
⁴ <https://bda.nres.gov.my/index.php/ms/hidden-news/1012-cuaca-panas-hasil-tanaman-lebih-banyak-berkualiti>

⁵ <https://www.mstar.com.my/lokal/semasa/2016/04/04/musim-panas-jejas-tanaman>

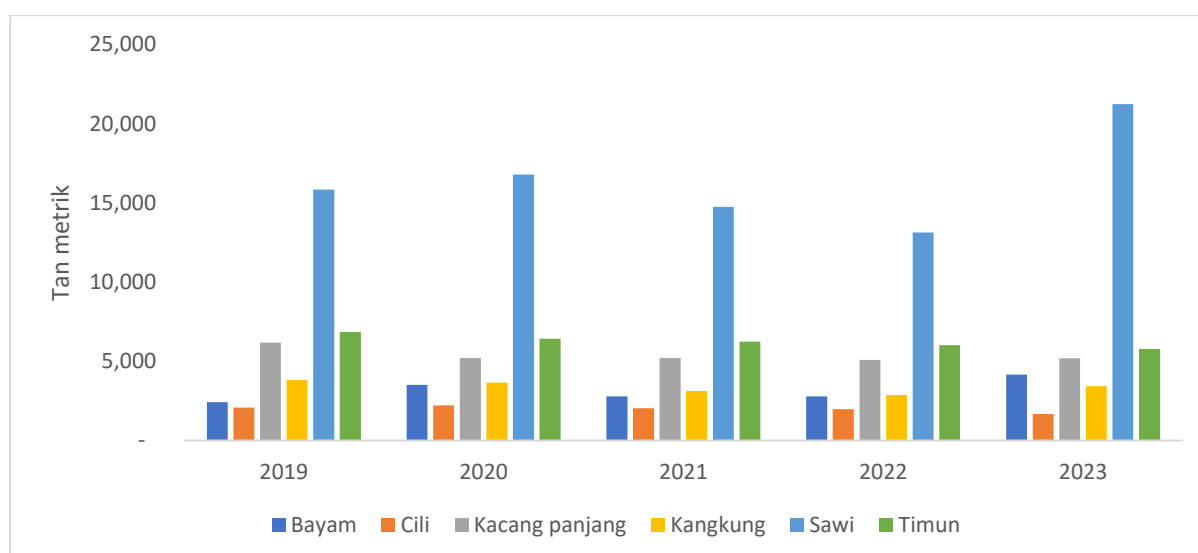
⁶ Jabatan Pertanian Malaysia

⁷ Jabatan Perangkaan Malaysia

Carta 1: Pengeluaran dan kadar pertumbuhan sayur-sayuran di Sarawak, 2020-2024



Carta 2: Pengeluaran tanaman sayur-sayuran utama di Sarawak, 2019-2023



Sumber: Jabatan Pertanian Malaysia

Pengeluaran sayur-sayuran utama di Sarawak pada 2023 secara keseluruhan menunjukkan peningkatan berbanding tahun 2022, sejajar pertumbuhan positif sektor pertanian. Bayam, kacang panjang, kangkung dan sawi mencatat peningkatan ketara, dengan sawi meningkat paling tinggi sebanyak 61.6 peratus, manakala cili dan timun menunjukkan sedikit penurunan. Corak ini menunjukkan bahawa keadaan cuaca yang lebih kering pada 2023 telah memberi kesan positif terhadap kebanyakan tanaman berdaun, namun tanaman seperti timun yang sensitif terhadap kekeringan terjejas sedikit dalam pengeluarannya.

Bagi mengekalkan pengeluaran sayur-sayuran yang stabil dalam keadaan cuaca yang semakin tidak menentu, pelbagai langkah perlu diambil oleh petani dan pihak berwajib. Antara tindakan utama ialah memperluas penggunaan teknologi pertanian moden seperti sistem fertigasi, rumah lindungan hujan dan irigasi titisan, yang dapat membantu mengawal kelembapan tanah dan mengurangkan risiko penyakit tanaman akibat hujan berlebihan. Selain itu, pelaksanaan amalan pertanian lestari (*Good Agricultural Practices, GAP*) serta pembangunan infrastruktur saliran dan pengurusan air yang efisien mampu meningkatkan ketahanan tanaman terhadap perubahan iklim. Kerajaan melalui Kementerian Pertanian dan Keterjaminan Makanan (KPKM) juga menyediakan bantuan teknikal, latihan, dan pembiayaan kepada petani bagi menggalakkan penggunaan teknologi hijau dan pengurusan ladang yang cekap. Langkah-langkah ini sejajar dengan aspirasi Dasar Agromakanan Negara 2.0 (DAN 2.0) yang menekankan adaptasi terhadap perubahan iklim dan kelestarian pengeluaran makanan negara⁸.

Secara keseluruhannya, perubahan corak cuaca di Malaysia seperti peningkatan suhu, hujan lebat, dan kejadian cuaca ekstrem seperti El Niño dan La Niña memberikan kesan yang ketara terhadap pengeluaran sayur-sayuran negara. Keadaan cuaca yang tidak menentu boleh menjejaskan pertumbuhan tanaman, menyebabkan kerosakan fizikal, kehilangan nutrien tanah, serta meningkatkan risiko penyakit tanaman. Walaupun begitu, sektor pertanian Malaysia menunjukkan tahap daya tahan yang baik melalui penerapan teknologi moden seperti sistem fertigasi, rumah lindungan hujan, dan pengurusan saliran yang cekap. Justeru, adaptasi terhadap perubahan iklim amat penting bagi memastikan pengeluaran sayur-sayuran kekal stabil dan mampu memenuhi keperluan makanan negara secara berterusan.

Penafian:

Pandangan yang dinyatakan adalah pandangan penulis dan tidak mewakili pandangan DOSM.

⁸ Kementerian Pertanian dan Keterjaminan Makanan (KPKM)

Implications of Weather on Vegetable Production in Sarawak

Siti Nur Syafiqah Mohd Zulkiflee, Syed Ibrahim Mohd Jamaluddin, Latifah Mohamed Shah

Malaysia's agricultural sector is a key pillar in ensuring food supply stability and is one of the important components of the national economy, this sector operates in an equatorial climate that previously exhibited relatively consistent and predictable weather patterns. Although such conditions are generally favourable for agricultural activities, recent changes in weather patterns and increasing climatic variability have significantly impacted crop production, particularly vegetables. Malaysia's humid tropical climate, characterised by year-round rainfall and monsoon seasons, offers strong potential for vegetable cultivation. On average, Malaysia receives about 2,000–2,500 millimetres (mm) of rainfall annually, accompanied by fairly uniform temperatures throughout the year¹. In addition, the country's weather is significantly influenced by two major monsoon seasons which is the Northeast Monsoon (November–March), which brings heavy rainfall to the east coast of Peninsular Malaysia and the Southwest Monsoon (May–September), which is relatively drier in certain areas. In summary, the combination of humid and stable weather conditions along with distinct wet and moderately dry seasons creates significant implications for Malaysia's vegetable agriculture sector.

Heavy rainfall and flooding are among the main weather factors that can adversely affect vegetable production in Malaysia. While rainwater is essential for plant growth, excessive rainfall can bring various negative impacts on soil health, root systems and crop yields. Malaysia often experiences unpredictable wet seasons, particularly during the Northeast Monsoon. Prolonged heavy rainfall can trigger flash floods in low-lying areas and damage crops due to overly saturated soils that cause root rot, meanwhile essential nutrients are washed away and unable to be absorbed by plants². As a result, vegetable prices can surge by up to 100 percent due to severely disrupted production and reduced supply³.

In 2023, Malaysia experienced prolonged hot weather from May to August due to the shift to the Southwest Monsoon¹. The El Niño phenomenon occurs when sea surface temperatures in the equatorial Pacific Ocean rise by more than 0.5 degrees Celsius above the long-term average¹. In Malaysia, El Niño typically brings prolonged hot and dry conditions, reduced rainfall and decreased soil moisture which can adversely affect crop growth, including rice and vegetables. Although not all vegetable crops are affected by hot weather, temperatures rising up to 40 degrees Celsius undoubtedly impose negative impacts on agricultural activities as a

¹ Malaysian Meteorological Department

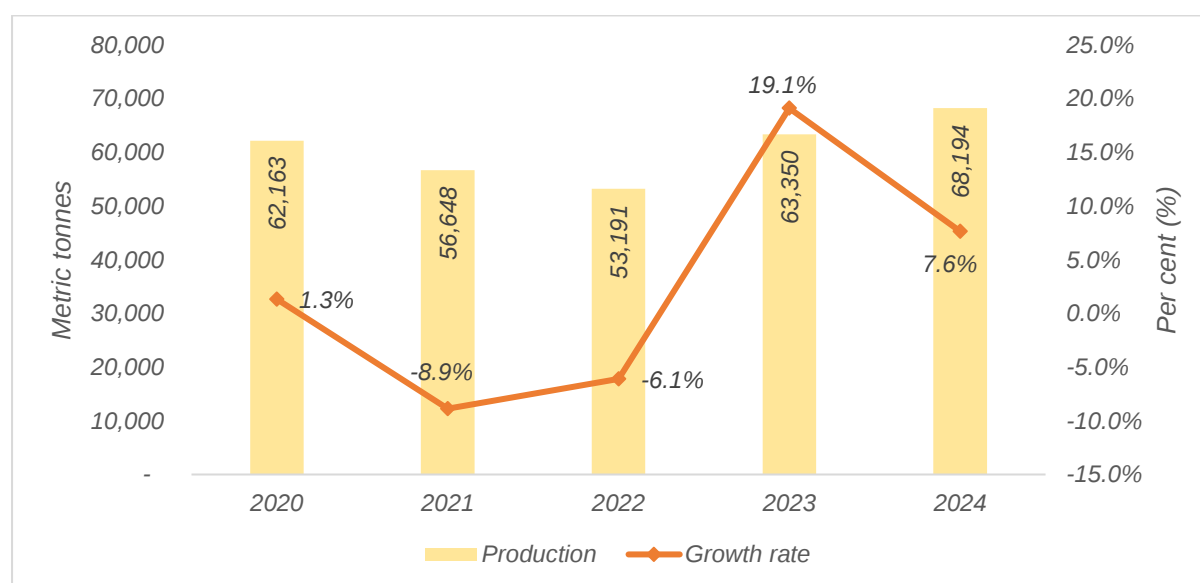
² <https://agrimag.my/bm/article-details/kesan-pokok-apabila-hujan-berlebihan>

³ www.bharian.com.my/hujan-lebat-punca-harga-makanan-meningkat

whole⁴. Extreme heat can hinder optimal plant growth, reduce the quality of harvested vegetables and consequently contribute to rising market prices⁵.

The amount of rainfall in Sarawak decreased between 2022 and 2023. In 2022, total recorded rainfall was 4,191.0 mm, whereas in 2023 it decreased to 3,608.5 mm¹. The decrease of 13.9 per cent reflects a drier climate in Sarawak. However, the production of vegetables in Sarawak remained positive despite lower rainfall in 2023, Sarawak recorded 63,350 metric tonnes of vegetable production in 2023 as compared to 53,191 metric tonnes in 2022⁶, marking an increase of 19.1 per cent. This situation aligns with the Gross Domestic Product (GDP) at constant 2015 prices for the vegetable subsector, which amounted to RM13,148 million with a modest growth rate of 0.2 per cent in 2022. In 2023, however, vegetable GDP at constant 2015 increased to RM13,842 million, accompanied by a stronger growth of 5.3 per cent⁷.

Chart 3: Vegetable production and growth rate in Sarawak, 2020–2024



Source: Department of Agriculture Malaysia

¹ Malaysian Meteorological Department

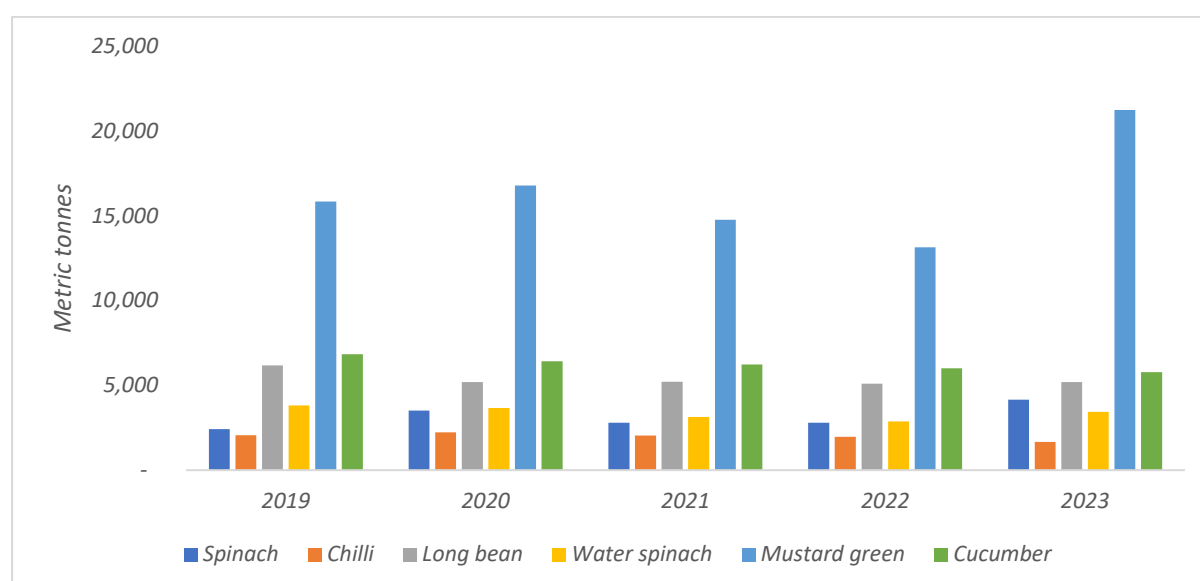
⁴ <https://bda.nres.gov.my/index.php/ms/hidden-news/1012-cuaca-panas-hasil-tanaman-lebih-banyak-berkualiti>

⁵ <https://www.mstar.com.my/lokal/semasa/2016/04/04/musim-panas-jejas-tanaman>

⁶ Department of Agriculture Malaysia

⁷ Department of Statistics Malaysia

Chart 4: Main vegetables production in Sarawak, 2019–2023



Source: Department of Agriculture Malaysia

Overall, main vegetable production in Sarawak in 2023 showed an increase as compared to 2022, in line with the positive growth in the agricultural sector. Spinach, long bean, water spinach and mustard green recorded significant increases, with mustard green showing the highest rise of 61.6 per cent, while chilli and cucumber saw slight declines. This pattern suggests that the drier conditions in 2023 benefitted most leafy crops, whereas crops such as cucumber which are sensitive to excessive dryness experienced minor reductions in output.

To maintain stable vegetable production amid increasingly unpredictable weather, various measures must be implemented by farmers and relevant authorities. Key actions include expanding the use of modern agricultural technologies such as fertigation systems, rain shelters and drip irrigation, which can help regulate soil moisture and reduce the risk of crop diseases caused by excessive rainfall. Additionally, implementing sustainable agricultural practices (Good Agricultural Practices, GAP) and improving water management and drainage infrastructure can enhance crop resilience to climate variability. The government, through the Ministry of Agriculture and Food Security (KPKM) will continue providing technical assistance, training and financial support to farmers to promote the adoption of green technologies and efficient farm management. These measures align with the aspirations of the National Agrofood Policy 2.0 (NAP 2.0), which emphasises climate adaptation and the sustainability of national food production⁸.

⁸ Ministry of Agriculture and Food Security (KPKM)

In conclusion, changes in Malaysia's weather patterns such as rising temperatures, heavy rainfall and extreme weather events like El Niño and La Niña pose significant impacts on vegetable production nationwide. Unpredictable weather can hinder plant growth, cause physical damage, reduce soil nutrient availability and increase crop disease risks. Nevertheless, Malaysia's agricultural sector has demonstrated strong resilience through the adoption of modern technologies such as fertigation systems, rain shelters and efficient drainage management. Therefore, climate adaptation is crucial to ensuring stable vegetable production and sustaining the nation's food supply.

Disclaimer:

The views expressed are those of the author and do not represent the views of DOSM.



JADUAL STATISTIK

STATISTICAL TABLES

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank

Jadual 1.1: Purata suhu, jumlah hujan dan purata kelembapan relatif, Sarawak, 2020-2024

Table 1.1: Mean temperature, total rainfall and mean relative humidity, Sarawak, 2020-2024

Stesen meteorologi (ketinggian dari purata paras laut dalam meter) <i>Meteorological station (height above mean sea level in metres)</i>	Tahun <i>Year</i>	Purata suhu (°C) <i>Mean temperature</i>		Hujan <i>Rainfall</i>		Purata kelembapan relatif <i>Mean relative humidity (%)</i>
		Min.	Maks. Max.	Jumlah Total (mm)	Bil. Hari No. of days	
Bintulu (24.3 m)	2020	24.2	31.8	4,248.0	242	87.4
	2021	23.8	31.9	4,021.2	227	85.6
	2022	23.7	31.7	4,323.4	219	85.9
	2023	23.9	32.0	3,403.9	215	87.4
	2024	24.3	32.3	4,033.9	225	85.8
Kapit (35.0 m)	2020	24.3	32.9	4,751.6	292	86.6
	2021	23.9	32.8	4,346.2	252	86.0
	2022	23.7	32.5	3,923.1	270	85.8
	2023	22.4	31.1	3,393.1	234	85.5
	2024	22.3	30.5	5,624.0	273	86.3
Kuching (20.9 m)	2020	24.0	32.0	4,079.6	258	86.8
	2021	23.6	32.0	4,436.6	236	85.2
	2022	23.6	31.8	3,958.4	250	86.3
	2023	24.0	32.4	4,335.2	248	83.4
	2024	24.3	32.3	5,042.8	249	84.7
Limbang (3.6 m)	2020	23.8	32.9	3,328.0	226	84.0
	2021	23.6	32.5	4,118.6	230	85.3
	2022	23.7	32.4	4,015.9	243	84.1
	2023	23.8	32.8	3,187.1	242	84.2
	2024	24.3	33.3	3,931.9	229	83.5
Miri (17.0 m)	2020	24.3	31.6	3,344.2	209	86.1
	2021	24.0	31.3	2,877.6	211	85.4
	2022	23.8	31.1	3,327.4	220	85.4
	2023	24.2	31.6	2,522.7	194	84.2
	2024	24.7	32.0	2,953.2	205	84.0
Sibu (30.9 m)	2020	23.8	32.3	3,275.4	258	85.5
	2021	23.6	32.4	3,251.4	235	84.5
	2022	23.3	31.8	4,202.4	249	85.5
	2023	23.7	32.2	3,757.5	245	85.9
	2024	24.0	32.2	3,868.5	249	85.8
Mulu (26.2 m)	2020	23.5	32.9	5,320.8	263	87.7
	2021	23.1	32.9	5,365.8	264	86.0
	2022	23.0	32.4	6,172.8	289	88.3
	2023	20.2	28.8	5,213.6	271	86.9
	2024	17.6	25.0	5,043.6	270	Def.
Sri Aman (9.6 m)	2020	23.6	32.4	3,343.2	242	87.7
	2021	23.2	32.3	3,518.0	222	86.8
	2022	23.3	32.5	3,604.7	232	86.6
	2023	23.1	32.2	3,055.2	209	Def.
	2024	22.7	31.0	4,000.8	251	86.5

Sumber: Jabatan Meteorologi Malaysia
Source: Malaysia Meteorological Department

Jadual 1.2: Purata tekanan aras laut, kelajuan angin permukaan, sinaran global, penyejatan dan bilangan hari kilat, Sarawak, 2020-2024

Table 1.2: Mean sea level pressure, surface wind speed, global radiation, evaporation and number of days with lightning, Sarawak, 2020-2024

Stesen meteorologi (ketinggian dari purata paras laut dalam meter) <i>Meteorological station (height above mean sea level in metres)</i>	Tahun <i>Year</i>	Purata tekanan aras laut <i>Sea level pressure (hPa)</i>	Purata kelajuan angin permukaan <i>Mean surface wind speed (m/s)</i>	Purata sinaran global <i>Mean global radiation (MJ/m²)</i>	Purata penyejatan <i>Mean evaporation (mm)</i>	Bil. hari kilat <i>No. of days with lightning</i>
Bintulu (24.3 m)	2020	1,009.6	1.8	n.a.	3.80	206
	2021	1,009.5	1.7	n.a.	3.80	187
	2022	1,009.2	1.7	n.a.	3.79	201
	2023	Def.	Def.	n.a.	Def.	150
	2024	1,009.4	1.5	n.a.	Def.	127
Kapit (35.0 m)	2020	1,010.0	0.8	19.21	n.a.	n.a.
	2021	1,009.9	0.8	19.00	n.a.	n.a.
	2022	1,009.5	0.8	18.51	n.a.	n.a.
	2023	1,010.2	Def.	18.65	n.a.	n.a.
	2024	1,001.2	0.8	18.83	n.a.	n.a.
Kuching (20.9 m)	2020	1,009.8	1.7	14.92	2.80	252
	2021	1,009.8	1.6	15.70	3.20	197
	2022	Def.	1.6	14.99	3.20	193
	2023	1,010.3	1.6	Def.	Def.	168
	2024	1,010.1	1.5	14.95	Def.	166
Limbang (3.6 m)	2020	1,009.4	1.3	n.a.	n.a.	154
	2021	1,009.4	1.3	n.a.	n.a.	162
	2022	1,009.0	1.3	n.a.	n.a.	159
	2023	1,010.1	1.3	n.a.	n.a.	125
	2024	1,009.4	1.3	n.a.	n.a.	120
Miri (17.0 m)	2020	1,009.3	2.2	17.79	4.00	149
	2021	1,009.3	2.1	19.30	3.80	115
	2022	1,009.0	2.1	Def.	3.93	149
	2023	1,010.1	2.0	Def.	Def.	113
	2024	1,009.5	1.7	19.00	Def.	104
Sibu (30.9 m)	2020	1,009.7	1.5	16.99	3.70	157
	2021	1,009.5	1.5	17.90	3.90	126
	2022	1,009.0	1.5	17.43	3.79	148
	2023	1,010.2	1.5	Def.	Def.	112
	2024	1,009.7	1.5	17.24	Def.	144
Mulu (26.2 m)	2020	1,009.7	0.9	n.a.	n.a.	n.a.
	2021	1,009.7	0.8	n.a.	n.a.	n.a.
	2022	1,009.3	Def.	n.a.	n.a.	n.a.
	2023	Def.	Def.	n.a.	n.a.	n.a.
	2024	Def.	Def.	n.a.	n.a.	n.a.
Sri Aman (9.6 m)	2020	1,009.6	0.8	n.a.	3.10	n.a.
	2021	1,009.6	0.8	n.a.	3.20	n.a.
	2022	1,009.0	0.7	n.a.	3.12	n.a.
	2023	1,007.5	0.7	n.a.	Def.	1
	2024	1,004.1	0.8	Def.	Def.	n.a.

Sumber: Jabatan Meteorologi Malaysia
Source: Malaysia Meteorological Department

Jadual 1.3: Purata bulanan tekanan aras laut, Sarawak, 2024

Table 1.3: Monthly mean sea level pressure, Sarawak, 2024

hPa

Stesen Station	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	1,010.8	1,010.4	1,010.6	1,008.7	1,008.5	1,009.8	1,009.1	1,009.9	1,008.7	1,009.7	1,008.7	1,008.4
Kuching	1,011.3	1,012.2	1,011.2	1,009.2	1,009.2	1,010.5	1,009.7	1,010.6	1,009.5	1,010.1	1,009.0	1,008.6
Miri	1,011.0	1,011.8	1,010.7	1,008.7	1,008.3	1,009.6	1,008.9	1,009.7	1,008.7	1,009.8	1,008.8	1,008.5
Sibu	1,011.3	1,012.1	1,011.1	1,009.3	1,009.0	1,009.7	1,008.9	1,009.8	1,008.6	1,009.6	1,008.7	1,008.3
Limbang	1,011.0	1,011.7	1,010.5	1,008.7	1,008.2	1,009.6	1,008.8	1,009.6	1,008.5	1,009.6	1,008.6	1,008.4
Kapit	906.4	1,011.7	1,010.7	1,009.1	1,008.9	1,010.2	1,009.5	1,010.3	1,009.2	1,010.0	1,009.1	1,008.8
Mulu	1,010.8	1,011.6	788.8	1,008.9	1,008.9	918.0	977.2	1,010.3	1,009.1	Def.	1,002.8	1,008.7
Sri Aman	1,011.4	1,012.3	1,011.2	1,009.2	1,009.2	973.7	974.3	1,010.6	1,009.5	1,010.1	1,009.0	1,008.7

Jadual 1.4: Purata bulanan kelajuan angin permukaan, Sarawak, 2024

Table 1.4: Monthly mean surface wind speed, Sarawak, 2024

m/s

Stesen Station	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	1.5	1.5	1.7	1.5	1.5	1.4	1.5	1.6	1.7	1.6	1.5	1.5
Kuching	1.4	1.5	1.6	1.5	1.3	1.4	1.6	1.5	1.7	1.5	1.4	1.4
Miri	2.3	2.6	2.5	2.1	1.4	1.4	1.3	1.3	2.0	1.3	0.9	1.2
Sibu	1.5	1.5	1.3	1.4	1.4	1.5	1.4	1.5	1.6	1.5	1.4	1.4
Limbang	1.4	1.5	1.6	1.3	1.2	1.2	1.2	1.2	1.3	1.4	1.2	1.1
Kapit	0.7	0.8	0.8	0.8	0.8	0.8	0.9	1.0	0.9	0.9	1.0	0.8
Mulu	0.8	0.8	0.9	0.8	0.5	0.7	0.5	0.8	0.7	0.9	Def.	0.9
Sri Aman	0.8	0.8	0.7	0.8	0.7	0.7	0.8	0.8	1.0	0.9	0.9	0.9

Jadual 1.5: Purata bulanan sinaran global, Sarawak, 2024

Table 1.5: Monthly mean global radiation, Sarawak, 2024

MJ/m²

Stesen Station	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Kuching	13.22	12.28	13.34	16.39	14.39	14.74	17.28	15.10	18.02	17.39	14.21	13.00
Miri	17.19	19.18	20.63	20.98	19.11	17.78	19.48	18.80	20.11	19.73	18.54	16.50
Sibu	16.07	16.68	16.21	18.23	16.87	16.45	18.94	16.84	20.03	17.25	16.95	16.32
Kapit	17.25	19.20	19.36	19.40	17.82	18.09	19.88	19.20	21.28	19.00	18.81	16.64
Sri Aman	n.a.	n.a.	15.35	n.a.	Def.	n.a.	n.a.	16.60	19.10	19.52	16.09	17.00

Jadual 1.6: Purata bulanan penyejatan, Sarawak, 2024

Table 1.6: Monthly mean evaporation, Sarawak, 2024

mm

Stesen Station	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	Def.	4.20	n.a.	n.a.	3.93	Def.	Def.	3.70	4.27	4.04	4.12	3.90
Kuching	Def.	Def.	n.a.	n.a.	3.68	3.75	4.20	3.59	4.60	3.10	3.13	3.50
Miri	Def.	4.10	n.a.	n.a.	4.13	Def.	Def.	4.06	4.25	4.40	4.08	3.70
Sibu	Def.	3.60	n.a.	n.a.	3.56	Def.	3.60	3.86	4.36	3.60	3.88	3.40
Sri Aman	2.76	Def.	n.a.	n.a.	2.88	2.77	3.60	3.36	3.68	3.60	3.33	3.33

Sumber: Jabatan Meteorologi Malaysia
Source: Malaysia Meteorological Department

Jadual 1.7: Bacaan maksimum harian Indeks Ultra Ungu (UV), Sib, 2024

Table 1.7: Daily maximum reading of the Ultra Violet (UV) Index, Sib, 2024

Stesen/ Station	Sib											
Bulan/ Monthly Hari/ Days	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
1	11+	11+	11+	11+	11+	10	11+	11+	11+	11+	11+	11+
2	10	11+	11+	11+	9	6	9	6	11+	11+	11+	11+
3	11+	10	11+	11+	11+	9	11+	n.a.	11	11+	11+	11+
4	11+	11+	11+	11+	11+	11+	11+	n.a.	11+	7	11+	11+
5	11+	11+	11+	11+	5	11+	11+	10	11+	10	11	11+
6	n.a.	11+	11+	11+	11+	11+	11+	11+	11+	n.a.	11+	11+
7	11+	11+	11+	11+	11+	11+	11+	11+	11+	10	10	11+
8	11+	11+	11+	11+	11+	7	11+	11+	11+	11+	11+	11+
9	11+	11+	11+	11+	11+	11+	11+	11+	10	11+	3	11+
10	11+	11+	11+	11+	11+	11+	11+	11+	11+	11+	11+	11+
11	11+	11+	11+	11+	4	11+	10	11+	11+	3	11+	11+
12	11+	11+	11+	11+	11+	11+	9	9	11+	11+	11+	10
13	11+	11+	11+	9	11+	11+	10	11+	11+	11+	11+	11+
14	11+	11+	11+	11+	11+	11+	11+	11+	n.a.	10	11+	10
15	11+	11+	11+	11+	11+	11+	9	9	11+	11+	11+	11+
16	11+	11+	11+	11+	11+	11+	11+	11+	11+	11+	11+	11+
17	11+	10	11+	11+	11+	11+	11+	11+	11+	6	11+	11+
18	10	10	11+	3	11+	8	9	11+	11+	11+	9	9
19	11+	9	11+	11+	11+	11+	11	9	11+	10	11+	8
20	8	11+	11+	11+	11+	10	11+	11+	11+	11+	11+	n.a.
21	11+	9	11+	11+	11+	8	11+	11+	n.a.	11+	11+	9
22	11+	11+	11+	11+	6	9	7	11+	n.a.	11+	5	n.a.
23	11+	11+	11+	11+	11+	7	11	11+	7	11+	11+	11+
24	11+	11+	11+	11+	8	11+	11	11+	11+	11+	11+	7
25	11+	11+	11+	11+	11+	11+	11+	11+	7	11+	6	n.a.
26	11+	11+	11+	n.a.	11+	11+	11	11+	11+	11+	11+	9
27	11+	11+	9	11+	11+	10	11+	10	9	11+	11+	9
28	11+	11+	11+	11+	10	11+	11	9	11+	11+	10	10
29	11+	11+	11+	9	5	11	10	8	8	7	9	11+
30	11+		11+	11+	11+	11+	8	11+	11+	11+	6	10
31	11+		11+		11+		11+	11+		11+		8

Nota: Def. Nilai defektif/
Notes: Defective value

Sumber: Jabatan Meteorologi Malaysia
Source: Malaysia Meteorological Department

n.a. Tiada pencerapan data disebabkan masalah instrumentasi
No data observation due to instrumentation problems

Status Indeks Ultra Ungu (UV)
Ultra Violet Index (UV) status

0 to 2	Rendah / Low
3 to 5	Sederhana / Moderate
6 to 7	Tinggi / High
8 to 10	Sangat Tinggi / Very High
11+	Melampau / Extreme

Jadual 1.8: Senarai lembangan sungai utama di Sarawak

Table 1.8: List of major river basins in Sarawak

Bil. No.	Nama lembangan sungai River basins name	Luas (km ²) Area	Kategori Category	Negeri/ Negara State/ Country
1	Batang Balingian	2227.47	1	Sarawak
2	Batang Baram	22109.00	1	Sarawak
3	Batang Kayan	1063.38	1	Sarawak
4	Batang Kemena	5765.56	1	Sarawak
5	Batang Kerian	1479.11	1	Sarawak
6	Batang Lawas	996.75	1	Sarawak
7	Batang Lupar	5942.87	1	Sarawak
8	Batang Matu	355.56	1	Sarawak
9	Batang Mukah	2030.60	1	Sarawak
10	Batang Oya	2078.89	1	Sarawak
11	Batang Rajang	50531.60	1	Sarawak
12	Batang Rambungan	132.41	1	Sarawak
13	Batang Sadong	3526.61	1	Sarawak
14	Batang Salak	97.80	1	Sarawak
15	Batang Samarahan	903.09	1	Sarawak
16	Batang Saribas	1905.66	1	Sarawak
17	Batang Suai	1443.19	1	Sarawak
18	Batang Tatau	4848.21	1	Sarawak
19	Batang Terusan	2443.09	1	Sarawak
20	Sg. Bayan	91.17	1	Sarawak
21	Sg. Bedengan	111.60	1	Sarawak
22	Sg. Maludam	164.01	1	Sarawak
23	Sg. Samunsam	176.09	1	Sarawak
24	Sg. Santubong	114.51	1	Sarawak
25	Sg. Sematan	216.64	1	Sarawak
26	Sg. Siang-Siang	95.04	1	Sarawak
27	Sg. Sibul Laut	128.70	1	Sarawak
28	Sg. Sparan	93.26	1	Sarawak/ Indonesia
29	Sg. Likau	106.46	1	Sarawak
30	Sg. Limbang	3682.40	1	Sarawak
31	Sg. Miri	680.91	1	Sarawak
32	Sg. Niah	1316.20	1	Sarawak
33	Sg. Nyalau	267.27	1	Sarawak
34	Sg. Sarawak	1726.84	1	Sarawak
35	Sg. Sarupai Sadupai	217.41	1	Sarawak
36	Sg. Sebuyau	520.53	1	Sarawak
37	Sg. Sibuti	892.66	1	Sarawak
38	Sg. Similajau	532.02	1	Sarawak
39	Sg. Telong	97.75	1	Sarawak
40	Sg. Pandaruan	222.38	3	Sarawak/ Brunei

Sumber: Jabatan Pengairan dan Saliran
Source: Department of Irrigation and Drainage

Nota: Kajian Persempadanan Lembangan Sungai Malaysia Fasa I oleh Bahagian Pengurusan Lembangan Sungai (2009)

Notes: Malaysia River Basin Boundary Study Phase I by the River Basin Management Division (2009)

Kategori 1: Lembangan sungai dalam 1 negeri

Category 1: River basin within the state

Kategori 2: Lembangan sungai melibatkan lebih dari 1 negeri

Category 2: River basin shared with more than 1 state

Lembangan sungai utama: Lembangan yang berkeluasan melebihi 80 km²

Main river basins: An area of over 80 km²

Jadual 1.9: Panjang pesisiran pantai, Sarawak

Table 1.9: Coastal length, Sarawak

Negeri State	Panjang pantai (km) Coastal length	Peratus (%) Per cent
Malaysia	8,840.00	100.0
Sarawak	1,234.10	14.0

Nota/ Notes: National Coastal Erosion Study for Malaysia (2015)

Sumber: Jabatan Pengairan dan Saliran
Source: Department of Irrigation and Drainage

Jadual 1.10: Empangan dan kolam takungan di Sarawak

Table 1.10: Dams and reservoirs in Sarawak

Bil. No.	Nama empangan (Tahun siap dibina) Name of dam (Year of completion)	Lokasi (Negeri) Location (State)	Empangan Dams				Kolam takungan Reservoirs			
			Tinggi Height (m)	Panjang puncak Peak length (m)	Aras puncak Top peak (m)	Kawasan tadahan Catchment area (km ²)	Luahan alur limpah maksimum Kapasiti Maximum flood flow (cumecs)	Luas permukaan Surface area (km ²)	Aras biasa Ordinary level (m)	
1	Batang Ai Hydroelectric Station (1985)	Sarawak	85.00	649.00	115.00	1,200.00	2,650.00	2,613.00	90.00	112.00
2	Sika (1963)	Sarawak	27.00	270.00	25.00	30.00	3.28	n.a.	0.35	20.00
3	Assyakirin (2004)	Sarawak	n.a.	1,000.00	35.00	27.90	n.a.	n.a.	n.a.	30.00

Sumber: Jabatan Pengairan dan Saliran
Source: Department of Irrigation and Drainage

Jadual 1.11: Keluasan tanah mengikut daerah, Sarawak, 2024

Table 1.11: Land area by districts, Sarawak, 2024

Bil. No.	Negeri/ Daerah State/ Districts	Keluasan (km ²) Area
MALAYSIA		331,579.95
Sarawak		124,171.20
1	Kuching	1,498.40
2	Bau	775.00
3	Lundu	1,835.40
4	Samarahan	421.10
5	Asajaya	290.00
6	Simunjan	396.00
7	Gedong	612.00
8	Sebuyau	707.20
9	Serian	1,774.00
10	Tebedu	688.00
11	Siburan	356.70

Jadual 1.11: Keluasan tanah mengikut daerah, Sarawak, 2024 (samb.)

Table 1.11: Land area by districts, Sarawak, 2024 (cont'd)

Bil. No.	Negeri/ Daerah State/ Districts	Keluasan (km ²) Area
12	Sri Aman	1,174.00
13	Pantu	760.60
14	Lingga	519.90
15	Lubok Antu	3,173.90
16	Betong	1,561.10
17	Saratok	867.20
18	Pusa	939.50
19	Kabong	832.00
20	Sarikei	958.00
21	Pakan	908.80
22	Maradong	740.10
23	Daro	1,118.50
24	Matu	1,600.80
25	Tanjung Manis	832.90
26	Julau	1,729.90
27	Sibu	2,192.20
28	Dalat	948.10
29	Mukah	2,468.80
30	Kanowit	2,241.80
31	Bintulu	1,973.40
32	Sebauh	5,126.10
33	Tatau	5,112.90
34	Kapit	3,973.40
35	Song	3,664.90
36	Belaga	16,125.80
37	Bukit Mabong	14,924.70
38	Miri	5,159.80
39	Marudi	3,078.60
40	Limbang	3,974.60
41	Lawas	3,680.20
42	Selangau	3,912.40
43	Telang Usan	9,816.10
44	Beluru	4,905.10
45	Subis	3,821.30

Sumber: Jabatan Ukur dan Pemetaan Malaysia

Source: Department of Survey and Mapping Malaysia

Jadual 1.12: Kawasan perlindungan sepenuhnya, Sarawak

Table 1.12: Totally protected area, Sarawak

Negeri State	Kawasan perlindungan Protected area	Keluasan (Hektar) Area (Hectares)	Bilangan spesies Number of species			
			Fauna			
			Mamalia Mammals	Burung Birds	Reptilia Reptiles	Amfibia Amphibians
a. Taman Negara National Parks						
1	Taman Negara Bako	2,727.00	49	257	-	48
2	Taman Negara Batang Ai	24,040.00	37	121	-	9
3	Taman Negara Bukit Lambir	6,949.00	65	247	85	-
4	Taman Negara Bukit Tiban	8,000.00	-	-	-	-
5	Taman Negara Gunung Buda - Ext I	11,307.00	-	300	60	-
6	Taman Negara Gunung Gading	4,196.00	30	55	6	9
7	Taman Negara Gunung Mulu - Ext. I dan Ext. II	85,671.00	96	307	-	240
8	Taman Negara Kubah	2,230.00	23	126	7	66
9	Taman Negara Kuching Wetlands	6,610.00	-	-	-	-
10	Taman Negara Loagan Bunut	10,736.00	60	187	34	23
11	Taman Negara Maludam	43,147.00	6	24	2	-
12	Taman Negara Terumbu Karang Miri-Sibuti	186,930.00	-	-	-	-
13	Taman Negara Niah	3,138.00	7	59	-	104
14	Taman Negara Pulong Tau - Ext. 1	69,817.00	-	-	-	-
15	Taman Negara Rajang Mangrove	9,373.00	-	-	-	-
16	Taman Negara Santubong	1,410.00	-	-	-	-
17	Taman Negara Similajau - Ext I	8,996.00	60	258	-	-
18	Taman Negara Sedilu	6,311.00	-	-	-	-
19	Taman Negara Talang Satang	19,414.02	-	6	9	-
20	Taman Negara Tanjung Datu	1,349.00	35	46	-	11
21	Taman Negara Banjaran Bungo	8,096.00	-	-	-	-
22	Taman Negara Ulu Sebuyau	18,287.00	-	-	-	-
23	Taman Negara Usun Apau	49,355.00	-	-	-	-
24	Taman Negara Batang Lassa	22,000.00	-	-	-	-
25	Taman Negara Bruit-Patok	14,526.00	-	-	-	-
26	Taman Negara Pulau Sampadi	1,240.0	-	-	-	-
27	Taman Negara Pelagus	2,041.0	-	-	-	-
28	Taman Negara Gunung Lesong	595.0	-	-	-	-
b. Santuari Hidupan Liar Wildlife Sanctuaries						
1	Santuari Hidupan Liar Samunsam - Ext I	22798	-	-	-	-
2	Santuari Hidupan Liar Pulau Tukong Ara-Banun	1.4	-	-	-	-
3	Santuari Hidupan Liar Lanjak Entimau - Ext I	168758	27	31	5	19
4	Santuari Hidupan Liar Sibuti	678	9	122	-	3

Bilangan spesies Number of species							
Fauna			Flora				
Moluska Molluscs	Ikan Fish	Cnidarians	Spesies invertebrat yang lain ¹ Other invertebrate species	Rumpai laut Seaweeds	Rumput laut Sea grass	Tumbuhan Plants	
40	-	-	213	-	-	600	
-	17	-	-	-	-	1,200	
-	-	-	33	-	-	823	
-	-	-	-	-	-	-	
-	-	-	-	-	-	2,500	
-	-	-	14	-	-	58	
20,000	-	-	8,100	-	-	4,300	
94	-	-	88	-	-	298	
-	-	-	-	-	-	-	
-	70	-	231	-	-	637	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	97	-	-	334	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	42	-	-	-	-	131	
-	-	-	-	-	-	-	
-	-	-	-	-	1	-	
-	-	-	40	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	13	-	1	-	-	10	
-	-	-	-	-	-	-	

Jadual 1.12: Kawasan perlindungan sepenuhnya, Sarawak (samb.)

Table 1.12: Totally protected area, Sarawak (cont'd)

Bilangan spesies <i>Number of species</i>						
Negeri <i>State</i>	Kawasan perlindungan <i>Protected area</i>	Keluasan (Hektar) <i>Area (Hectares)</i>	Fauna			
			Mamalia	Burung	Reptilia	Amfibia
			<i>Mammals</i>	<i>Birds</i>	<i>Reptiles</i>	<i>Amphibians</i>
c. Rizab Semulajadi <i>Nature Reserve</i>						
1	Rezab Semulajadi Fairy Cave	56.0	2	1	1	1
2	Sama Jaya Nature Reserve	37.9	9	20	4	11
3	Semangoh Nature Reserves	653.0	38	45	-	-
4	Bukit Hitam Nature Reserve	147.0	-	-	-	-
5	Bukit Sembiling Nature Reserve	101.0	-	-	-	-
6	Rezab Semulajadi Bukit Lima	219.2	2	-	-	-
7	Pulau Tun Ahmad Zaidi Nature Reserve	547.0	-	-	-	-

Nota: ¹Lain-lain invertebrat seperti Serangga, Arthropods dan Echinoderms

Notes: Other invertebrates like Insects, Arthropods and Echinoderms

Meliputi maklumat daripada Sarawak Forestry Corporation

Includes information from Sarawak Forestry Corporation

- : Tidak diliputi oleh agensi semasa tahun rujukan Banci Kawasan Perlindungan dan Kepelbagaian Biologi 2014

Not covered by the agency during Biodiversity and Protected Areas Census 2014 reference year

Bilangan spesis <i>Number of species</i>							
Fauna				Flora			
Moluska <i>Molluscs</i>	Ikan <i>Fish</i>	Cnidarians	Spesies invertebrat yang lain ¹ <i>Other invertebrate species</i>	Rumpai laut <i>Seaweeds</i>	Rumput laut <i>Sea grass</i>	Tumbuhan <i>Plants</i>	
1	1	-	3	-	-	4	
-	4	-	30	-	-	188	
-	-	-	-	-	-	1,175	
-	-	-	-	-	-	-	
-	-	-	-	-	-	-	
-	-	-	-	-	-	1	
-	-	-	-	-	-	-	

Jadual 1.13: Kawasan berhutan dan tidak berhutan, Sarawak, 2019-2022

Table 1.13: Forested and non-forested areas, Sarawak, 2019-2022

Tahun Year	Berhutan Forested		Tidak Berhutan Non-Forested	
	Hektar Hectares	(%)	Hektar Hectares	(%)
2019	7,721,615	62.05	4,723,413	37.95
2020	7,671,222	61.64	4,773,806	38.36
2021	7,645,454	61.43	4,799,574	38.57
2022	7,638,499	61.52	4,778,601	38.48

Jadual 1.14: Keluasan hutan simpanan kekal¹, Sarawak, 2019-2022

Table 1.14: Area of permanent reserved forest, Sarawak, 2019-2022

Tahun Year	2019	2020	2021	2022
Keluasan Area	3,964,880	3,964,880	3,939,113	3,939,113

Nota: ¹ *Permanent Reserved Forest (PRF) di Sarawak terdiri daripada paya gambut, paya laut dan bukit*

Notes: Permanent reserved forest in Sarawak consists of peat swamp forest, mangrove forest and hill

Jadual 1.15: Keluasan hutan paya gambut, Sarawak, 2019-2022

Table 1.15: Area of peat swamp forest, Sarawak, 2019-2022

Tahun Year	2019	2020	2021	2022
Keluasan Area	326,087	320,914	320,101	318,081

Nota: *Bagi Sarawak, merujuk kepada hutan paya gambut di dalam Permanent Reserved Forest (PRF), Totally Protected Area (TPA) [National Park, Nature Reserve dan Wild Life Sanctuaries] dan hutan tanah kerajaan*

Notes: For Sarawak, refer to peat swamp forests in the Permanent Reserved Forest (PRF), the Totally Protected Area (TPA) [National Park, Nature Reserve and Wild Life Sanctuaries] and government land forests

Sumber: Kementerian Sumber Asli dan Kelestarian Alam,
Jabatan Perhutanan Semenanjung Malaysia

Source: Ministry of Natural Resources and Environmental Sustainability,
Forestry Department Peninsular Malaysia

Jadual 1.16: Keluasan hutan paya laut, Sarawak, 2019-2022

Table 1.16: Area of mangrove forest, Sarawak, 2019-2022

Tahun Year	Hektar Hectares			
	2019	2020	2021	2022
Keluasan Area	72,587	72,579	72,579	67,634

Sumber: Kementerian Sumber Asli, Alam Sekitar dan Perubahan Iklim,
Jabatan Hutan Sarawak

Source: Ministry of Natural Resources, Environment and Climate Change,
Forest Department Sarawak

Nota: Bagi Sarawak, merujuk kepada hutan paya gambut di dalam *Permanent Reserved Forest (PRF)*, *Totally Protected Area (TPA)* [*National Park, Nature Reserve dan Wild Life Sanctuaries*] dan hutan tanah kerajaan

Notes: For Sarawak, refer to peat swamp forests in the *Permanent Reserved Forest (PRF)*, the *Totally Protected Area (TPA)* [*National Park, Nature Reserve and Wild Life Sanctuaries*] and government land forests

Jadual 1.17: Status kualiti udara mengikut stesen, Sarawak, 2020-2024

Table 1.17: Air quality status by station, Sarawak, 2020-2024

Negeri/ Stesen State/ Station	Tahun Year	Bilangan hari Number of days				
		Baik Good (0-50)	Sederhana Moderate (51-100)	Tidak Sihat Unhealthy (101-200)	Sangat Tidak Sihat Very Unhealthy (201-300)	Berbahaya Hazardous (>300)
Bintulu	2020	162	204	-	-	-
	2021	145	220	-	-	-
	2022	107	258	-	-	-
	2023	53	311	1	-	-
	2024	106	260	-	-	-
ILP, Miri	2020	208	156	2	-	-
	2021	279	86	-	-	-
	2022	304	61	-	-	-
	2023	223	142	-	-	-
	2024	282	83	1	-	-
Kapit	2020	359	7	-	-	-
	2021	325	40	-	-	-
	2022	316	49	-	-	-
	2023	257	108	-	-	-
	2024	314	52	-	-	-
Kuching	2020	278	88	-	-	-
	2021	289	76	-	-	-
	2022	339	25	-	-	-
	2023	183	179	3	-	-
	2024	260	104	2	-	-
Limbang	2020	332	34	-	-	-
	2021	314	51	-	-	-
	2022	340	25	-	-	-
	2023	237	128	-	-	-
	2024	288	78	-	-	-

Jadual 1.17: Status kualiti udara mengikut stesen, Sarawak, 2020-2024 (samb.)

Table 1.17: Air quality status by station, Sarawak, 2020-2024 (cont'd)

 Bilangan hari
Number of days

Negeri/ Stesen State/ Station	Tahun Year	Baik Good (0-50)	Sederhana Moderate (51-100)	Tidak Sihat Unhealthy (101-200)	Sangat Tidak Sihat Very Unhealthy (201-300)	Berbahaya Hazardous (>300)
Miri	2020	143	223	-	-	-
	2021	154	211	-	-	-
	2022	247	117	-	-	-
	2023	183	182	-	-	-
	2024	225	141	-	-	-
Mukah	2020	344	22	-	-	-
	2021	304	60	-	-	-
	2022	330	34	-	-	-
	2023	218	147	-	-	-
	2024	283	83	-	-	-
Samalaju	2020	251	115	-	-	-
	2021	227	138	-	-	-
	2022	168	197	-	-	-
	2023	73	292	-	-	-
	2024	128	238	-	-	-
Samarahan	2020	334	31	-	-	-
	2021	298	66	-	-	-
	2022	297	66	-	-	-
	2023	186	178	1	-	-
	2024	258	106	2	-	-
Sarikei	2020	328	38	-	-	-
	2021	267	98	-	-	-
	2022	270	95	-	-	-
	2023	277	88	-	-	-
	2024	288	78	-	-	-
Sibu	2020	291	75	-	-	-
	2021	296	69	-	-	-
	2022	314	49	2	-	-
	2023	263	100	2	-	-
	2024	280	84	2	-	-
Sri Aman	2020	320	46	-	-	-
	2021	289	76	-	-	-
	2022	313	51	1	-	-
	2023	259	98	8	-	-
	2024	308	56	2	-	-

Nota: Stesen yang tidak mencukupi 365 hari adalah disebabkan masalah teknikal
 Notes: Stations with inadequate 365 days is due to technical problem

Sumber: Jabatan Alam Sekitar
 Source: Department of Environment

Jadual 1.18: Bacaan minimum dan maksimum bulanan Indeks Pencemaran Udara (IPU)¹, Sarawak, 2024

Table 1.18: Monthly minimum and maximum Air Pollutant Index (API), Sarawak, 2024

Stesen <i>Station</i>	Jan.		Feb.		Mac <i>Mar.</i>		Apr.		Mei <i>May</i>		Jun <i>June</i>	
	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>
Bintulu	22	64	33	79	23	70	17	64	23	61	15	66
ILP, Miri	15	55	18	53	36	123	14	62	13	49	9	55
Kapit	21	54	21	55	11	57	9	57	10	32	9	41
Kuching	13	54	20	59	23	67	20	62	22	52	13	59
Limbang	13	55	20	53	27	70	17	48	14	43	11	49
Miri	18	68	23	62	35	85	15	55	17	54	12	55
Mukah	14	59	33	57	15	59	14	45	13	46	12	52
Samalaju	21	61	31	65	24	69	21	61	24	58	18	55
Samarahan	13	52	18	55	18	62	21	56	18	55	15	52
Sarikei	10	53	13	61	16	71	9	52	10	72	9	52
Sibu	14	58	17	154	22	61	17	55	13	60	13	52
Sri Aman	11	57	12	54	11	57	11	52	10	49	10	52

Stesen <i>Station</i>	Julai <i>July</i>		Ogos <i>Aug.</i>		Sept.		Okt. <i>Oct.</i>		Nov.		Dis. <i>Dec.</i>	
	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>	Min.	Maks. <i>Max.</i>
Bintulu	27	79	19	61	17	78	24	67	20	64	19	62
ILP, Miri	11	71	17	56	18	87	14	63	14	56	14	44
Kapit	11	57	9	35	14	62	10	56	12	38	12	49
Kuching	20	72	18	61	27	136	16	67	15	61	14	56
Limbang	15	64	12	52	15	69	13	71	14	72	12	40
Miri	14	78	14	66	19	83	20	65	21	59	23	55
Mukah	15	70	11	54	18	80	14	66	16	52	16	51
Samalaju	21	73	20	61	30	82	27	71	22	62	27	62
Samarahan	19	71	18	58	22	114	16	64	19	57	18	54
Sarikei	12	70	9	48	20	93	17	68	11	53	11	45
Sibu	13	70	13	54	18	86	18	64	14	56	16	47
Sri Aman	13	71	10	49	15	153	11	66	11	41	26	43

Nota: ¹ Bacaan status kualiti udara berdasarkan bacaan maksimum harian
Notes: Air quality status readings are based on daily maximum readings

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Status Indeks Pencemaran Udara (IPU)
Air Pollutant Index (API) status

IPU/ API	Status IPU / API status
0-50	Baik / Good
51-100	Sederhana / Moderate
101-200	Tidak Sihat / Unhealthy
201-300	Sangat Tidak Sihat / Very Unhealthy
>300	Berbahaya / Hazardous

Jadual 1.19: Purata tahunan kepekatan berdasarkan jenis bahan pencemar di udara, Sarawak, 2020-2024

Table 1.19: Annually average concentration based on the type of air pollutants in the air, Sarawak, 2020-2024

Stesen Station	Tahun Year	Habuk Halus (PM _{2.5}) Particulate Matter (µg/m ³)	Habuk Halus (PM ₁₀) Particulate Matter (µg/m ³)	Ozon Permukaan Bumi (O ₃) Ground Level Ozone (ppm)	Karbon Monoksida (CO) Carbon Monoxide (ppm)	Sulfur Dioksida (SO ₂) Sulphur Dioxide (ppm)	Nitrogen Dioksida (NO ₂) Nitrogen Dioxide (ppm)
Bintulu	2020	11.20 ^r	19.82	0.013	0.407	0.0004	0.0039 ^r
	2021	12.43	21.20 ^r	0.013	0.403 ^r	0.0004	0.0044
	2022	12.69 ^r	20.47 ^r	0.012	0.426	0.0005	0.0043
	2023	16.39	25.16 ^r	0.008	0.494 ^r	0.0006	0.0045
	2024	12.75	19.66	0.008	0.495	0.0006	0.0042
ILP Miri	2020	11.71 ^r	18.64 ^r	-	-	-	-
	2021	8.89 ^r	15.52	-	-	-	-
	2022	8.00 ^r	14.34	-	-	-	-
	2023	10.02 ^r	16.81 ^r	-	-	-	-
	2024	9.17	16.59	-	-	-	-
Kapit	2020	6.31	13.15	-	-	-	-
	2021	7.05 ^r	13.78 ^r	-	-	-	-
	2022	8.10	15.29	-	-	-	-
	2023	9.52 ^r	17.63 ^r	-	-	-	-
	2024	6.65	14.23	-	-	-	-
Kuching	2020	8.99	15.81	0.011	0.615	0.0006	0.0041
	2021	8.46 ^r	14.69 ^r	0.012	0.457 ^r	0.0012	0.0041
	2022	7.25 ^r	15.37 ^r	0.012	0.345 ^r	0.0010	0.0060
	2023	14.56 ^r	21.94 ^r	0.013	0.373	0.0014	0.0058
	2024	10.16	18.29	0.011	0.261	0.0014	0.0057
Limbang	2020	6.55 ^r	13.81 ^r	-	-	-	-
	2021	7.54	15.47 ^r	-	-	-	-
	2022	6.70	14.14	-	-	-	-
	2023	9.95 ^r	18.40 ^r	-	-	-	-
	2024	8.31	15.78	-	-	-	-
Miri	2020	12.56 ^r	19.77 ^r	0.016	0.559	0.0006	0.0029
	2021	12.12 ^r	18.64 ^r	0.015	0.479 ^r	0.0011	0.0032
	2022	9.70 ^r	15.89	0.014	0.496	0.0008	0.0033
	2023	11.97 ^r	18.28 ^r	0.014	0.566	0.0010	0.0033
	2024	10.89	18.76	0.014	0.466	0.0010	0.0032
Mukah	2020	6.52	16.15	-	-	-	-
	2021	7.39 ^r	17.78 ^r	-	-	-	-
	2022	7.31	17.72 ^r	-	-	-	-
	2023	10.80 ^r	21.37 ^r	-	-	-	-
	2024	8.54	19.41	-	-	-	-
Samalaju	2020	9.51 ^r	19.13 ^r	-	-	0.0006	0.0019
	2021	9.86 ^r	20.15 ^r	-	-	0.0006	0.0026
	2022	11.26 ^r	20.95 ^r	-	-	0.0008	0.0025 ^r
	2023	15.40 ^r	24.29 ^r	-	-	0.0010	0.0026
	2024	12.75	22.99	-	-	0.0011	0.0026

Jadual 1.19: Purata tahunan kepekatan berdasarkan jenis bahan pencemar di udara, Sarawak, 2020-2024 (samb.)

Table 1.19: Annually average concentration based on the type of air pollutants in the air, Sarawak, 2020-2024 (cont'd)

Stesen Station	Tahun Year	Habuk Halus (PM _{2.5}) <i>Particulate Matter</i> (µg/m ³)	Habuk Halus (PM ₁₀) <i>Particulate Matter</i> (µg/m ³)	Ozon Permukaan Bumi (O ₃) <i>Ground Level Ozone</i> (ppm)	Karbon Monoksida (CO) <i>Carbon Monoxide</i> (ppm)	Sulfur Dioksida (SO ₂) <i>Sulphur Dioxide</i> (ppm)	Nitrogen Dioksida (NO ₂) <i>Nitrogen Dioxide</i> (ppm)
Samarahan	2020	7.02	14.07	-	-	-	-
	2021	8.18	14.94	-	-	-	-
	2022	8.39 ^r	15.54 ^r	-	-	-	-
	2023	13.16	20.80	-	-	-	-
	2024	9.84	17.42	-	-	-	-
Sarikei	2020	7.11	14.21	-	-	-	-
	2021	8.89 ^r	15.28 ^r	-	-	-	-
	2022	8.63 ^r	15.18 ^r	-	-	-	-
	2023	9.29 ^r	16.01 ^r	-	-	-	-
	2024	8.20	15.15	-	-	-	-
Sibu	2020	8.27	14.43 ^r	0.010	0.430 ^r	0.0011	0.0039
	2021	8.02 ^r	14.53 ^r	0.010	0.405 ^r	0.0007	0.0036
	2022	7.73 ^r	14.16 ^r	0.010	0.430	0.0006	0.0041
	2023	9.90 ^r	16.49 ^r	0.010	0.425	0.0006	0.0043
	2024	9.14	16.43	0.009	0.462	0.0006	0.0034
Sri Aman	2020	7.46 ^r	14.71 ^r	-	-	-	-
	2021	7.82 ^r	15.09	-	-	-	-
	2022	7.42	14.74	-	-	-	-
	2023	10.56	18.54	-	-	-	-
	2024	7.68	14.85	-	-	-	-

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Jadual 1.20: Purata bulanan kepekatan Habuk Halus (PM_{2.5}) di udara, Sarawak, 2020-2024Table 1.20: Monthly average concentration of Particulate Matter (PM_{2.5}) in the air, Sarawak, 2020-2024µg/m³

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	2020	10.84	14.32	13.43	12.81	11.72	8.90	9.05	12.36	10.12	12.57	8.90	9.39
	2021	7.20	11.64	10.71	15.88	12.98	14.13	16.59	12.21	12.25	13.67	10.39	11.51
	2022	10.99	12.42	14.33	14.88	13.44	13.28	14.37	11.54	12.21	9.87	12.04	12.90
	2023	13.39	15.31	13.82	19.35	18.01	17.96	17.98	20.96	21.45	17.15	11.10	10.22
	2024	12.04	15.13	15.13	11.91	11.97	12.29	15.42	10.72	15.51	10.55	11.83	10.54
ILP Miri	2020	7.52	22.72	18.27	13.69	7.22	9.32	7.38	11.77	8.68	15.47	11.13	7.35
	2021	5.60	7.16	9.73	13.71	7.82	9.47	10.98	9.03	8.41	10.83	7.65	6.33
	2022	7.99	6.37	6.21	7.66	8.37	7.12	10.23	11.50	10.63	6.68	6.56	6.68
	2023	6.18	5.98	8.18	11.57	11.65	11.62	12.51	14.03	15.59	11.98	5.29	5.63
	2024	6.85	7.77	16.86	8.67	6.97	7.06	11.47	7.20	13.89	9.09	7.72	6.52
Kapit	2020	5.97	7.98	6.81	6.56	5.86	5.13	5.98	7.65	5.78	6.51	5.26	6.23
	2021	6.36	8.43	8.64	9.33	6.90	6.97	7.21	6.03	6.29	6.62	6.03	5.80
	2022	8.03	7.90	9.27	9.26	8.92	7.99	7.97	6.36	8.40	9.84	6.70	6.59
	2023	7.43	6.14	6.32	10.68	7.51	8.24	9.18	14.39	16.28	13.21	6.78	8.05
	2024	9.41	9.55	7.75	5.48	4.12	5.06	7.24	4.64	9.27	6.80	4.98	5.48
Kuching	2020	9.35	11.04	9.00	8.63	7.91	7.92	8.20	13.07	9.18	9.25	7.44	6.96
	2021	5.90	9.44	8.22	12.22	8.67	8.33	10.10	10.63	9.39	6.78	6.06	5.74
	2022	6.03	8.88	7.21	7.11	6.69	4.53	5.52	8.50	8.14	7.69	7.36	9.29
	2023	8.93	7.84	8.58	15.40	13.00	13.48	15.22	24.80	34.78	16.71	8.56	7.36
	2024	7.06	9.22	10.80	8.53	7.51	9.42	14.95	9.83	17.74	10.87	8.28	7.72
Limbang	2020	7.52	9.35	9.47	7.64	6.52	5.22	4.83	7.28	4.93	5.81	5.00	5.03
	2021	4.81	8.08	7.57	9.13	6.53	8.12	8.30	7.07	7.41	10.02	7.03	6.47
	2022	7.45	6.45	6.50	7.80	6.61	6.15	8.01	7.03	6.12	6.59	5.76	5.91
	2023	6.26	7.37	8.82	12.51	10.45	12.11	12.00	13.54	12.99	11.58	6.14	5.68
	2024	7.24	9.11	15.18	7.57	5.85	6.35	9.05	5.32	11.34	8.89	8.01	5.80
Miri	2020	12.75	21.05	13.50	10.42	8.95	13.10	10.84	12.79	10.34	11.38	14.26	11.33
	2021	8.77	18.37	15.01	13.47	10.66	14.69	13.08	11.01	9.75	11.48	8.78	10.37
	2022	11.96	10.04	7.75	9.26	12.08	10.35	10.94	10.23	9.05	8.12	8.20	8.48
	2023	8.88	8.83	10.66	15.21	12.44	14.63	15.28	15.68	15.46	12.64	6.80	7.17
	2024	10.02	12.18	17.69	9.43	8.26	8.31	13.45	8.59	14.01	9.82	10.06	8.87
Mukah	2020	5.89	7.21	7.09	6.78	5.77	4.89	5.58	9.06	7.07	8.33	5.17	5.38
	2021	5.18	6.66	6.70	9.55	7.17	6.91	9.46	8.05	8.19	8.93	5.81	6.14
	2022	7.32	7.02	7.56	7.30	7.84	7.17	9.55	7.78	6.58	5.69	7.29	6.63
	2023	6.15	6.38	10.88	16.46	10.93	11.81	14.05	13.08	15.11	12.32	6.96	5.45
	2024	7.35	9.30	10.81	6.46	6.00	7.31	11.63	6.80	14.15	9.73	6.44	6.46
Samalaju	2020	9.97	14.89	11.73	10.24	8.02	7.48	7.71	9.80	8.75	9.78	8.34	7.46
	2021	7.77	9.82	9.84	11.42	9.33	10.01	13.12	10.19	9.81	10.64	7.34	9.08
	2022	11.31	9.63	10.25	10.56	10.41	10.33	12.16	11.45	11.48	11.80	12.82	12.87
	2023	12.04	15.44	15.38	24.02	19.03	14.10	14.51	16.37	18.85	15.37	10.37	9.34
	2024	12.55	14.34	16.40	11.89	10.74	10.34	14.60	10.56	16.84	12.87	11.08	10.75
Samarahan	2020	6.63	7.03	7.24	7.80	6.23	6.08	6.42	10.42	7.64	7.56	5.66	5.48
	2021	5.65	8.40	7.83	10.21	8.36	8.68	9.02	8.63	8.76	9.36	5.86	7.43
	2022	7.03	7.23	8.62	9.16	9.43	6.50	9.63	10.53	9.08	7.35	7.11	9.01
	2023	8.11	6.79	8.60	13.63	11.11	12.54	18.38	20.27	23.55	18.04	9.37	7.56
	2024	6.70	9.04	10.65	9.14	7.96	8.14	14.14	8.78	17.42	10.61	8.16	7.30

Jadual 1.20: Purata bulanan kepekatan Habuk Halus (PM_{2.5}) di udara, Sarawak, 2020-2024 (samb.)Table 1.20: Monthly average concentration of Particulate Matter (PM_{2.5}) in the air, Sarawak, 2020-2024 (cont'd)µg/m³

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Sarikei	2020	9.10	9.31	7.77	6.78	6.25	5.31	5.39	9.77	6.72	7.91	5.47	5.54
	2021	4.88	7.58	7.01	9.85	6.22	6.47	10.84	6.72	6.16	6.85	14.75	19.39
	2022	20.10	16.75	6.96	7.54	8.79	4.78	7.69	6.79	5.26	4.99	5.95	7.99
	2023	5.77	4.80	7.81	11.54	8.60	8.46	10.24	13.23	15.74	12.38	6.93	6.03
	2024	5.42	7.44	11.10	5.62	8.78	5.30	11.22	5.60	15.49	9.61	6.67	6.11
Sibu	2020	10.16	10.59	10.48	9.14	8.79	6.72	6.60	9.74	7.04	8.16	5.82	6.05
	2021	6.07	10.19	8.29	11.07	7.48	7.78	10.25	7.69	7.44	7.95	5.96	6.09
	2022	8.39	9.85	8.95	8.39	8.40	6.57	8.35	8.18	6.92	5.87	6.23	6.62
	2023	8.72	7.44	8.10	11.85	8.58	8.37	10.27	13.05	14.64	12.68	7.93	7.23
	2024	7.75	11.78	11.54	8.10	6.82	7.24	12.23	6.67	14.36	9.42	6.82	6.94
Sri Aman	2020	7.29	10.24	7.55	7.76	6.73	5.80	5.65	10.64	7.20	9.23	5.06	6.32
	2021	4.67	8.29	7.98	9.03	8.67	7.44	10.07	7.79	9.23	8.10	6.15	6.37
	2022	7.82	8.01	8.24	9.88	10.12	6.48	7.82	9.26	6.23	5.36	4.44	5.36
	2023	6.18	6.17	6.05	11.01	7.42	8.41	11.47	19.31	24.05	14.65	6.03	5.95
	2024	5.94	6.76	7.98	5.37	5.20	6.22	11.28	6.00	18.09	8.65	5.43	5.28

Nota: Garis Panduan Kualiti Udara Malaysia: PM_{2.5} tidak melebihi 50 µg/m³Notes: Malaysian Ambient Air Quality Guidelines: PM_{2.5} not exceeding 50 µg/m³

Sumber: Jabatan Alam Sekitar

Source: Department of Environment

Jadual 1.21: Purata bulanan kepekatan Habuk Halus (PM₁₀) di udara, Sarawak, 2020-2024Table 1.21: Monthly average concentration of Particulate Matter (PM₁₀) in the air, Sarawak, 2020-2024µg/m³

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	2020	19.27	24.61	21.49	20.02	20.21	16.66	16.83	21.67	18.81	22.58	16.98	18.76
	2021	13.46	20.51	19.54	26.65	21.83	22.91	26.90	20.63	21.12	21.28	19.02	20.50
	2022	18.25	20.90	21.84	22.87	21.58	23.13	24.95	19.35	18.12	14.93	18.75	20.94
	2023	20.85	24.47	22.67	28.59	26.62	28.59	28.33	31.92	30.88	25.08	16.60	17.36
	2024	20.86	25.57	24.77	17.93	16.33	18.35	19.74	15.28	22.54	14.35	20.90	19.30
ILP Miri	2020	14.87	33.22	25.76	20.89	13.86	15.09	13.22	18.01	15.52	22.01	17.42	13.77
	2021	10.87	13.98	16.97	20.09	14.43	16.46	18.01	15.61	13.81	17.55	14.63	13.84
	2022	14.83	11.72	10.82	12.07	17.69	14.08	17.21	17.53	16.89	12.79	12.61	13.85
	2023	12.21	13.32	15.44	18.68	19.62	18.86	18.74	22.10	23.85	18.21	8.97	11.77
	2024	14.35	14.38	24.25	16.39	15.68	14.82	19.78	12.88	21.72	16.36	14.51	13.98
Kapit	2020	13.25	16.94	14.53	13.67	12.85	11.58	12.26	15.07	11.66	12.62	10.91	12.46
	2021	11.99	15.21	15.05	17.55	15.51	14.60	12.88	9.55	13.45	14.15	13.08	12.35
	2022	14.94	13.90	16.60	16.46	17.35	15.82	15.56	14.11	15.47	16.00	13.65	13.56
	2023	13.95	13.89	14.04	18.83	15.93	17.08	18.26	22.83	25.31	21.15	14.32	15.98
	2024	17.01	17.04	15.66	13.14	12.60	13.10	12.17	10.58	17.60	14.82	11.85	15.15
Kuching	2020	17.18	19.73	15.64	13.53	13.39	14.40	15.31	20.33	15.99	16.67	13.89	13.70
	2021	11.55	16.90	14.35	18.47	15.73	14.06	16.71	13.37	12.52	15.20	13.77	13.68
	2022	14.54	18.41	16.54	15.93	15.16	11.55	14.45	16.28	15.07	14.73	14.02	17.82
	2023	15.20	15.57	15.30	22.44	20.95	21.30	24.19	33.07	41.68	23.75	15.83	14.00
	2024	14.35	20.16	19.72	15.22	15.35	17.71	23.92	17.18	26.35	18.41	15.71	15.39

Jadual 1.21: Purata bulanan kepekatan Habuk Halus (PM₁₀) di udara, Sarawak, 2020-2024 (samb.)Table 1.21: Monthly average concentration of Particulate Matter (PM₁₀) in the air, Sarawak, 2020-2024 (cont'd)µg/m³

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Limbang	2020	15.33	19.01	17.33	15.91	14.30	11.20	10.26	13.66	12.06	12.91	11.48	12.35
	2021	11.10	16.52	16.64	17.22	14.52	15.58	16.60	14.40	15.46	19.09	14.41	14.06
	2022	15.57	14.25	14.30	15.35	13.90	13.80	16.70	13.95	12.58	14.17	12.32	12.81
	2023	12.81	15.24	17.61	21.70	19.83	20.59	23.07	22.12	21.69	20.29	13.50	12.40
	2024	15.42	17.94	23.71	15.79	12.48	13.21	15.71	12.09	18.79	15.69	14.88	13.68
Miri	2020	20.73	33.17	22.37	17.34	14.80	19.50	16.24	18.87	17.37	18.43	20.39	18.01
	2021	15.56	26.35	22.18	20.00	16.43	18.99	20.20	16.87	15.94	18.30	15.21	17.66
	2022	19.49	16.79	13.59	15.38	18.61	16.24	17.98	16.41	15.37	14.01	13.61	13.14
	2023	13.85	15.74	18.13	22.01	19.98	21.47	24.33	22.65	21.22	18.33	9.87	11.74
	2024	19.08	22.90	28.71	15.80	14.66	15.62	21.55	14.94	22.15	16.70	16.54	16.49
Mukah	2020	13.87	18.22	15.53	14.58	15.36	14.95	15.27	20.43	16.39	19.12	15.08	15.05
	2021	13.12	15.69	16.44	19.22	17.59	16.87	21.19	19.51	19.41	21.00	17.10	16.28
	2022	16.35	15.84	17.93	17.32	19.02	17.51	22.27	18.99	17.95	14.62	17.64	17.21
	2023	16.05	16.31	19.53	27.31	23.04	23.80	25.72	23.52	26.96	22.45	17.01	14.77
	2024	16.92	20.16	22.00	16.48	16.48	17.43	24.11	17.69	25.24	22.72	16.84	16.80
Samalaju	2020	21.87	29.29	21.97	18.84	16.19	14.94	15.96	18.26	17.76	19.52	17.48	17.51
	2021	17.06	20.59	19.28	23.75	27.30	18.28	23.63	19.30	18.08	20.42	15.47	18.66
	2022	20.61	23.60	19.79	18.93	18.92	19.33	24.22	19.98	21.72	21.07	20.74	22.44
	2023	19.56	25.25	25.44	31.50	28.11	23.60	25.23	24.86	27.83	24.40	18.30	17.46
	2024	23.69	27.17	29.01	21.53	20.54	20.41	25.02	19.02	26.89	22.44	20.21	19.95
Samarahan	2020	14.24	15.74	14.62	14.33	13.26	13.50	13.35	17.02	14.68	14.24	11.86	12.01
	2021	11.82	15.49	14.51	16.99	15.52	15.14	15.67	16.04	15.32	16.11	12.52	14.20
	2022	13.72	14.19	16.46	16.44	17.11	12.79	16.84	17.36	15.58	15.81	13.47	16.77
	2023	14.62	14.45	15.19	20.91	20.30	20.82	26.85	28.65	31.77	25.38	16.46	14.22
	2024	13.82	17.00	19.22	15.66	15.94	15.79	21.22	16.07	24.98	18.08	15.41	15.90
Sarikei	2020	16.78	18.89	15.66	12.93	11.21	11.65	11.28	17.33	14.53	15.26	12.19	12.82
	2021	11.19	14.97	14.04	17.46	13.34	11.17	16.42	13.95	14.01	13.07	19.49	24.20
	2022	25.20	21.82	14.40	14.05	15.39	11.45	14.92	13.70	11.79	11.55	12.70	15.18
	2023	10.61	10.84	14.35	18.07	15.96	15.91	17.77	20.07	23.27	19.62	13.52	12.15
	2024	12.80	15.78	19.76	11.91	15.43	11.61	17.65	11.57	22.47	19.95	13.28	9.53
Sibu	2020	18.41	20.48	16.65	12.61	13.07	10.55	13.20	17.23	13.25	14.73	11.21	11.83
	2021	11.34	17.82	15.08	18.44	14.48	14.29	17.46	14.39	13.97	13.88	11.49	11.70
	2022	15.06	16.10	17.29	15.81	15.65	13.47	15.88	15.36	13.55	8.99	9.84	12.96
	2023	15.03	14.05	14.97	19.30	15.65	14.82	17.62	19.81	18.89	19.16	14.89	13.73
	2024	15.23	21.92	21.67	14.75	13.19	13.94	19.86	13.02	21.37	16.16	13.41	12.69
Sri Aman	2020	15.49	18.74	15.85	14.98	13.41	12.91	10.38	18.28	14.83	16.65	11.53	13.42
	2021	10.58	15.69	14.96	17.35	16.98	13.96	17.36	16.02	16.41	15.24	13.15	13.38
	2022	15.76	14.83	15.42	17.82	18.26	14.75	15.40	16.54	13.21	11.42	10.63	12.81
	2023	12.29	13.66	13.40	19.02	16.78	15.93	19.82	29.44	33.11	22.57	14.11	12.34
	2024	13.02	14.76	16.70	12.96	13.29	14.54	17.51	9.05	26.48	15.74	12.19	12.02

Nota: Garis Panduan Kualiti Udara Malaysia: PM₁₀ tidak melebihi 120 µg/m³
 Notes: Malaysian Ambient Air Quality Guidelines: PM₁₀ not exceeding 120 µg/m³ within

Sumber: Jabatan Alam Sekitar
 Source: Department of Environment

Jadual 1.22: Purata bulanan kepekatan Ozon Permukaan Bumi (O₃) di udara, Sarawak, 2020-2024Table 1.22: Monthly average concentration of Ground Level Ozone (O₃) in the air, Sarawak, 2020-2024

ppm

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	2020	0.016	0.019	0.015	0.016	0.012	0.010	0.011	0.012	0.009	0.010	0.011	0.010
	2021	0.015	0.017	0.014	0.018	0.014	0.013	0.012	0.010	0.010	0.009	0.009	0.011
	2022	0.012	0.011	0.011	0.011	0.011	0.012	0.014	0.013	0.012	0.011	0.012	0.014
	2023	0.012	0.010	0.014	0.013	0.009	0.007	0.006	0.007	0.006	0.006	0.006	0.005
	2024	0.005	0.007	0.009	0.009	0.007	0.006	0.007	0.005	0.005	0.007	0.015	0.015
Kuching	2020	0.012	0.015	0.011	0.012	0.010	0.008	0.009	0.011	0.009	0.009	0.010	0.013
	2021	0.015	0.015	0.011	0.013	0.011	0.010	0.011	0.009	0.010	0.012	0.012	0.016
	2022	0.014	0.013	0.013	0.014	0.012	0.011	0.012	0.012	0.011	0.010	0.011	0.014
	2023	0.013	0.012	0.012	0.015	0.012	0.012	0.012	0.015	0.014	0.013	0.013	0.014
	2024	0.012	0.009	0.012	0.009	0.009	0.011	0.012	0.010	0.015	0.013	0.012	0.013
Miri	2020	0.017	0.022	0.017	0.019	0.016	0.013	0.012	0.015	0.012	0.014	0.016	0.016
	2021	0.014	0.018	0.015	0.017	0.016	0.014	0.015	0.013	0.014	0.016	0.013	0.015
	2022	0.015	0.014	0.013	0.014	0.013	0.013	0.014	0.014	0.014	0.014	0.013	0.015
	2023	0.013	0.013	0.016	0.017	0.014	0.014	0.014	0.014	0.014	0.013	0.013	0.012
	2024	0.015	0.017	0.019	0.014	0.014	0.013	0.014	0.011	0.015	0.014	0.013	0.014
Sibu	2020	0.011	0.015	0.011	0.011	0.010	0.008	0.008	0.010	0.008	0.010	0.009	0.009
	2021	0.012	0.014	0.010	0.012	0.011	0.010	0.010	0.008	0.009	0.009	0.010	0.011
	2022	0.011	0.010	0.010	0.010	0.012	0.008	0.010	0.009	0.008	0.009	0.011	0.012
	2023	0.010	0.010	0.012	0.012	0.010	0.008	0.008	0.010	0.009	0.009	0.009	0.009
	2024	0.009	0.010	0.010	0.009	0.007	0.008	0.008	0.007	0.010	0.010	0.009	0.013

Nota: Garis Panduan Kualiti Udara Malaysia: O₃ tidak melebihi 0.1 ppmNotes: Malaysian Ambient Air Quality Guidelines: O₃ not exceeding 0.1 ppm**Sumber: Jabatan Alam Sekitar**

Source: Department of Environment

Jadual 1.23: Purata bulanan kepekatan Karbon Monoksida (CO) di udara, Sarawak, 2020-2024

Table 1.23: Monthly average concentration of Carbon Monoxide (CO) in the air, Sarawak, 2020-2024

ppm

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	2020	0.441	0.352	0.432	0.436	0.448	0.420	0.344	0.450	0.421	0.387	0.376	0.373
	2021	0.364	0.351	0.353	0.380	0.398	0.394	0.459	0.372	0.356	0.461	0.506	0.447
	2022	0.420	0.428	0.423	0.523	0.430	0.393	0.438	0.577	0.364	0.420	0.312	0.386
	2023	0.524	0.411	0.468	0.608	0.496	0.399	0.501	0.587	0.537	0.478	0.469	0.453
	2024	0.455	0.496	0.508	0.394	0.518	0.441	0.510	0.439	0.594	0.521	0.553	0.511
Kuching	2020	0.543	0.557	0.548	0.515	0.664	0.600	0.586	0.694	0.606	0.656	0.677	0.732
	2021	0.710	0.640	0.468	0.645	0.526	0.350	0.502	0.297	0.381	0.299	0.400	0.260
	2022	0.367	0.303	0.344	0.416	0.332	0.316	0.341	0.239	0.322	0.407	0.407	0.340
	2023	0.425	0.236	0.386	0.361	0.439	0.381	0.449	0.357	0.458	0.414	0.306	0.254
	2024	0.189	0.222	0.187	0.299	0.198	0.296	0.341	0.333	0.307	0.320	0.215	0.230
Miri	2020	0.549	0.596	0.522	0.533	0.573	0.641	0.466	0.506	0.598	0.690	0.494	0.537
	2021	0.543	0.474	0.474	0.484	0.485	0.429	0.573	0.477	0.431	0.403	0.494	0.482
	2022	0.521	0.462	0.441	0.485	0.435	0.392	0.505	0.495	0.585	0.493	0.604	0.530
	2023	0.614	0.592	0.616	0.639	0.560	0.580	0.527	0.551	0.559	0.606	0.421	0.525
	2024	0.284	0.425	0.564	0.559	0.496	0.345	0.449	0.535	0.441	0.518	0.450	0.526
Sibu	2020	0.448	0.286	0.240	0.253	0.316	0.351	0.572	0.556	0.598	0.458	0.582	0.502
	2021	0.233	0.291	0.333	0.384	0.450	0.430	0.471	0.358	0.443	0.441	0.531	0.490
	2022	0.525	0.432	0.520	0.392	0.443	0.364	0.404	0.372	0.422	0.461	0.434	0.387
	2023	0.490	0.465	0.430	0.373	0.356	0.356	0.468	0.512	0.426	0.391	0.432	0.406
	2024	0.340	0.384	0.585	0.511	0.415	0.384	0.432	0.444	0.652	0.516	0.401	0.480

Nota: Garis Panduan Kualiti Udara Malaysia: CO tidak melebihi 9 ppm

Notes: Malaysian Ambient Air Quality Guidelines: CO not exceeding 9 ppm

Sumber: Jabatan Alam Sekitar

Source: Department of Environment

Jadual 1.24: Purata bulanan kepekatan Sulfur Dioksida (SO₂) di udara, Sarawak, 2020-2024Table 1.24: Monthly average concentration of Sulphur Dioxide (SO₂) in the air, Sarawak, 2020-2024

ppm

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	2020	0.0006	0.0005	0.0004	0.0003	0.0003	0.0002	0.0004	0.0004	0.0003	0.0004	0.0003	0.0003
	2021	0.0003	0.0003	0.0003	0.0004	0.0004	0.0003	0.0005	0.0004	0.0005	0.0005	0.0004	0.0003
	2022	0.0003	0.0005	0.0004	0.0004	0.0006	0.0007	0.0005	0.0005	0.0005	0.0003	0.0005	0.0004
	2023	0.0006	0.0006	0.0006	0.0006	0.0007	0.0005	0.0006	0.0004	0.0006	0.0007	0.0005	0.0004
	2024	0.0007	0.0005	0.0008	0.0007	0.0007	0.0006	0.0005	0.0004	0.0006	0.0006	0.0005	0.0004
Kuching	2020	0.0003	0.0003	0.0002	0.0003	0.0007	0.0004	0.0003	0.0003	0.0006	0.0013	0.0008	0.0010
	2021	0.0010	0.0013	0.0017	0.0014	0.0007	0.0010	0.0014	0.0010	0.0011	0.0012	0.0013	0.0008
	2022	0.0010	0.0008	0.0009	0.0009	0.0009	0.0014	0.0016	0.0008	0.0007	0.0009	0.0011	0.0012
	2023	0.0012	0.0013	0.0015	0.0015	0.0011	0.0012	0.0015	0.0018	0.0020	0.0015	0.0008	0.0008
	2024	0.0008	0.0013	0.0014	0.0017	0.0015	0.0015	0.0011	0.0014	0.0017	0.0015	0.0014	0.0010
Miri	2020	0.0005	0.0005	0.0005	0.0005	0.0004	0.0005	0.0005	0.0007	0.0007	0.0008	0.0008	0.0011
	2021	0.0012	0.0014	0.0015	0.0015	0.0008	0.0006	0.0007	0.0008	0.0009	0.0009	0.0011	0.0015
	2022	0.0007	0.0002	0.0003	0.0006	0.0007	0.0009	0.0012	0.0012	0.0009	0.0007	0.0010	0.0010
	2023	0.0011	0.0006	0.0009	0.0010	0.0008	0.0006	0.0009	0.0011	0.0013	0.0015	0.0010	0.0007
	2024	0.0010	0.0012	0.0011	0.0007	0.0007	0.0008	0.0010	0.0012	0.0008	0.0010	0.0010	0.0011
Samalaju	2020	0.0009	0.0011	0.0011	0.0007	0.0004	0.0004	0.0004	0.0005	0.0005	0.0007	0.0005	0.0004
	2021	0.0006	0.0010	0.0007	0.0005	0.0005	0.0004	0.0006	0.0006	0.0007	0.0004	0.0004	0.0005
	2022	0.0008	0.0010	0.0007	0.0006	0.0005	0.0006	0.0007	0.0007	0.0008	0.0007	0.0008	0.0011
	2023	0.0009	0.0023	0.0025	0.0011	0.0007	0.0006	0.0009	0.0005	0.0007	0.0007	0.0007	0.0006
	2024	0.0015	0.0015	0.0019	0.0008	0.0008	0.0007	0.0010	0.0010	0.0012	0.0007	0.0010	0.0011
Sibu	2020	0.0006	0.0007	0.0009	0.0009	0.0008	0.0008	0.0011	0.0012	0.0013	0.0013	0.0016	0.0014
	2021	0.0012	0.0010	0.0007	0.0006	0.0004	0.0006	0.0007	0.0007	0.0007	0.0005	0.0006	0.0006
	2022	0.0010	0.0007	0.0005	0.0005	0.0006	0.0005	0.0005	0.0008	0.0004	0.0004	0.0007	0.0006
	2023	0.0007	0.0005	0.0007	0.0007	0.0008	0.0006	0.0008	0.0006	0.0006	0.0006	0.0005	0.0006
	2024	0.0006	0.0006	0.0005	0.0004	0.0005	0.0006	0.0006	0.0006	0.0005	0.0006	0.0007	0.0008

Nota: Garis Panduan Kualiti Udara Malaysia: SO₂ tidak melebihi 0.035 ppm
 Notes: Malaysian Ambient Air Quality Guidelines: SO₂ not exceeding 0.035 ppm

Sumber: Jabatan Alam Sekitar
 Source: Department of Environment

Jadual 1.25: Purata bulanan kepekatan Nitrogen Dioksida (NO₂) di udara, Sarawak, 2020-2024Table 1.25: Monthly average concentration of Nitrogen Dioxide (NO₂) in the air, Sarawak, 2020- 2024

ppm

Stesen Station	Tahun Year	Jan.	Feb.	Mac Mar.	Apr.	Mei May	Jun June	Julai July	Ogos Aug.	Sept.	Okt. Oct.	Nov.	Dis. Dec.
Bintulu	2020	0.0044	0.0039	0.0035	0.0031	0.0039	0.0037	0.0032	0.0042	0.0039	0.0045	0.0040	0.0050
	2021	0.0041	0.0038	0.0040	0.0053	0.0041	0.0043	0.0049	0.0042	0.0047	0.0045	0.0046	0.0048
	2022	0.0042	0.0037	0.0039	0.0048	0.0044	0.0048	0.0042	0.0038	0.0047	0.0036	0.0047	0.0046
	2023	0.0040	0.0043	0.0035	0.0045	0.0046	0.0048	0.0049	0.0052	0.0049	0.0044	0.0043	0.0041
	2024	0.0041	0.0037	0.0035	0.0041	0.0047	0.0049	0.0049	0.0041	0.0038	0.0037	0.0043	0.0044
Kuching	2020	0.0048	0.0041	0.0035	0.0023	0.0032	0.0041	0.0043	0.0044	0.0049	0.0047	0.0046	0.0042
	2021	0.0033	0.0038	0.0042	0.0051	0.0042	0.0034	0.0033	0.0032	0.0040	0.0043	0.0050	0.0052
	2022	0.0072	0.0056	0.0057	0.0073	0.0059	0.0054	0.0054	0.0059	0.0054	0.0058	0.0064	0.0064
	2023	0.0057	0.0050	0.0051	0.0054	0.0063	0.0062	0.0060	0.0067	0.0058	0.0057	0.0066	0.0054
	2024	0.0050	0.0043	0.0047	0.0050	0.0053	0.0063	0.0068	0.0063	0.0066	0.0060	0.0060	0.0056
Miri	2020	0.0030	0.0029	0.0032	0.0017	0.0023	0.0028	0.0025	0.0034	0.0031	0.0034	0.0035	0.0032
	2021	0.0028	0.0032	0.0032	0.0040	0.0032	0.0031	0.0030	0.0026	0.0027	0.0032	0.0036	0.0038
	2022	0.0035	0.0030	0.0030	0.0037	0.0035	0.0036	0.0033	0.0033	0.0028	0.0025	0.0034	0.0035
	2023	0.0037	0.0028	0.0030	0.0042	0.0033	0.0033	0.0035	0.0034	0.0031	0.0035	0.0031	0.0032
	2024	0.0028	0.0028	0.0024	0.0033	0.0037	0.0033	0.0037	0.0036	0.0035	0.0029	0.0030	0.0037
Samalaju	2020	0.0017	0.0016	0.0019	0.0016	0.0017	0.0017	0.0017	0.0021	0.0019	0.0020	0.0023	0.0025
	2021	0.0023	0.0022	0.0022	0.0030	0.0029	0.0025	0.0031	0.0030	0.0026	0.0024	0.0024	0.0026
	2022	0.0025	0.0024	0.0025	0.0023	0.0023	0.0024	0.0027	0.0023	0.0027	0.0023	0.0025	0.0025
	2023	0.0023	0.0026	0.0023	0.0027	0.0027	0.0030	0.0028	0.0027	0.0026	0.0023	0.0026	0.0024
	2024	0.0027	0.0021	0.0023	0.0024	0.0028	0.0027	0.0030	0.0023	0.0027	0.0029	0.0028	0.0025
Sibu	2020	0.0045	0.0042	0.0032	0.0023	0.0030	0.0037	0.0044	0.0041	0.0041	0.0040	0.0040	0.0049
	2021	0.0035	0.0031	0.0035	0.0043	0.0029	0.0031	0.0038	0.0032	0.0035	0.0036	0.0038	0.0053
	2022	0.0048	0.0032	0.0034	0.0037	0.0038	0.0045	0.0037	0.0045	0.0040	0.0040	0.0047	0.0052
	2023	0.0053	0.0044	0.0042	0.0056	0.0042	0.0037	0.0039	0.0039	0.0041	0.0039	0.0046	0.0041
	2024	0.0033	0.0035	0.0039	0.0029	0.0030	0.0035	0.0031	0.0030	0.0036	0.0036	0.0034	0.0035

Nota: Garis Panduan Kualiti Udara Malaysia: NO₂ tidak melebihi 0.16 ppm
 Notes: Malaysian Ambient Air Quality Guidelines: NO₂ not exceeding 0.16 ppm

Sumber: Jabatan Alam Sekitar
 Source: Department of Environment

Jadual 1.26: Status kualiti air marin di kawasan pantai, muara sungai dan pulau berdasarkan Indeks Kualiti Air Marin, Sarawak, 2020-2024

Table 1.26: Status of marine water quality in coastal, estuary and island areas based on Marine Water Quality Index, Sarawak, 2020-2024

Kawasan Area	Kategori Category															
	2020				2021				2022				2023			
	E	G	M	P	E	G	M	P	E	G	M	P	E	G	M	P
Pantai Coastal	-	3	19	1	4	12	7	-	6	5	12	-	-	-	23	-
Muara Estuary	-	1	13	-	2	4	8	-	1	5	8	-	-	-	14	-
Pulau Island	-	-	3	-	2	1	-	-	-	3	-	-	-	2	1	-

Bilangan stesen
Number of stations

Nota/ Notes:

Klasifikasi Indeks Kualiti Air Marin:
Marine Water Quality Index Classification:

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Kategori Category	Nilai indeks Index value
E	Terbaik/ Excellent (90 -100)
G	Baik/ Good (80 - <90)
M	Sederhana/ Moderate (50 - <80)
P	Tercemar/ Poor (0 - <50)

Jadual 2.1: Rizab minyak mentah dan kondensat, Sarawak, 2019-2023

Table 2.1: Reserves of crude oil and condensates, Sarawak, 2019-2023

Bilion tong
Billion barrels

Tahun Year	2019	2020	2021	2022	2023 ^p
Rizab Reserves	1.702	1.770	1.796	1.831	1.914

Sumber: Suruhanjaya Tenaga
Source: Energy Commission**Jadual 2.2: Rizab gas asli, Sarawak, 2019-2023**

Table 2.2: Reserves of natural gas, Sarawak, 2019-2023

Trilion Kubik Kaki Standard (TSCF)

Jenis Type	2019	2020	2021	2022	2023 ^p
Jumlah Total	45.855	44.399	46.11	46.993	52.704
Bersekutu Associated	1.419	1.151	1.971	2.956	3.921
Tidak bersekutu Non-associated	44.436	43.248	44.139	44.037	48.782

Sumber: Suruhanjaya Tenaga
Source: Energy Commission**Jadual 2.3: Keluasan hutan yang dilesenkan untuk pengusahaan, Sarawak, 2019-2023**

Table 2.3: Forest area licensed for harvesting by state, Sarawak, 2019-2023

Hektar
Hectares

Tahun Year	2019	2020	2021	2022	2023
Keluasan Area	82,458	51,488	59,183	44,823	58,518

Sumber: Jabatan Hutan Sarawak
Source: Forest Department Sarawak

Jadual 2.4: Pengeluaran produk kayu-kayan utama, Sarawak, 2019-2023

Table 2.4: Production of major timber products, Sarawak, 2019-2023

Meter padu
Cubic metres

Tahun Year	Kayu balak ¹ Logs	Kayu gergaji Sawn timber	Papan lapis Plywood	Venir Veneer	Kayu kumai Moulding
2019	4,074,254	466,483	1,360,566	319,661	12,094
2020	2,417,100	341,321	1,113,259	198,516	7,365
2021	2,334,910	303,624	944,905	125,968	8,262
2022	2,265,971	266,057	900,257	169,257	7,349
2023	2,312,765	255,533	749,809	202,484	8,305

Sumber: Jabatan Hutan Sarawak
Source: Forest Department Sarawak

Nota: ¹ Tidak termasuk pengeluaran kayu getah, kayu jaras, batang kelapa dan batang kelapa sawit

Notes: Exclude production of hevea logs, poles, coconut trunks and oil palm trunks

Data merujuk kepada syarikat yang berdaftar dengan Jabatan Hutan Sarawak an Perbadanan Kemajuan Perusahaan Kayu Sarawak sahaja

Data refers to establishment registered with Forest Department Sarawak and Sarwak Timber Industry Development Corporation only

Jadual 2.5: Pendaratan ikan laut, Sarawak, 2020-2024

Table 2.5: Landings of marine fish, Sarawak, 2020-2024

Tan metrik ('000)
Metric tonnes

Negeri Year	2020		2021		2022		2023		2024	
	Kuantiti Quantity	%	Kuantiti Quantity	%	Kuantiti Quantity	%	Kuantiti Quantity	%	Kuantiti Quantity	%
Malaysia	1,383.3	100.0	1,328.0	100.0	1,308.4	100.0	1,270.3	100.0	1,392.1	100.0
Sarawak	124.5	9.0	138.9	10.5	103.8	7.9	94.3	7.4	96.1	6.9

Sumber: Jabatan Perikanan Malaysia
Source: Department of Fisheries Malaysia

Jadual 2.6: Bilangan ternakan, Sarawak, 2020-2024

Table 2.6: Number of livestock, Sarawak, 2020-2024

Bilangan
Number

Negeri	Tahun	Jenis ternakan						
		Type of livestock						
State	Year	Kerbau Buffalo	Lembu Cattle	Kambing Goat	Bebiri Sheep	Babi Swine	Ayam Chicken	Itik Duck
Sarawak	2020	7,067	17,018	14,171	2,279	327,000	49,878,147	267,539
	2021	7,152	13,421	11,632	2,454	204,123	47,156,619	207,216
	2022	7,298	12,923	8,858	2,094	163,534	51,288,777	123,206
	2023	8,569	10,885	9,482	2,499	158,054	55,414,307	131,455
	2024	8,420	11,181	9,570	2,337	154,746	55,828,701	126,918

Sumber: Jabatan Perkhidmatan Veterinar
Source: Department of Veterinary Services

Jadual 2.7: Sembelihan ternakan yang direkod, Sarawak, 2019-2023

Table 2.7: Recorded slaughter of livestock, Sarawak, 2019-2023

Jenis ternakan Type of livestock					
	2019	2020	2021	2022	2023
Kerbau Buffalo	530	145	140	181	138
Lembu Cattle	3,080	1,852	1,230	1,787	1,731
Kambing Goat	700	300	242	116	121
Bebiri Sheep	100	33	20	-	-
Babi Swine	316,299	243,707	321,000	225,000	197,042

Bilangan
Number

Sumber: Jabatan Perkhidmatan Veterinar
Source: Department of Veterinary Services

Jadual 2.8: Rekabentuk kapasiti loji rawatan air, Sarawak, 2020-2024

Table 2.8: Water treatment plants design capacity, Sarawak, 2020-2024

Juta liter sehari (JLH)

Negeri State	2020	2021	2022	2023	2024
Sarawak ¹	2,064	2,189	2,275	2,329	2,430

Sumber: Kementerian Peralihan Tenaga dan Transformasi Air,
Suruhanjaya Perkhidmatan Air Negara

Source: Ministry of Energy Transition and Water Transformation
National Water Services Commission

Nota/ Notes:

¹Termasuk LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Lembaga Air Sibu, Lembaga Air Kuching dan Jabatan Bekalan Air Luar Bandar (JBALB) Sarawak

Includes LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Sibu Water Board, Kuching Water Board and Sarawak Rural Water Supply Department (JBALB)

Peningkatan rekabentuk kapasiti loji rawatan air adalah kerana terdapat penambahan loji baru dan pembesaran rekabentuk loji yang sedia ada. Pengurangan rekabentuk kapasiti loji rawatan air pula disebabkan oleh penutupan loji secara terus dan penutupan sementara loji rawatan air (akan dibuka semula apabila diperlukan)

The increase of water treatment plants design capacity is due to the addition of new plant and expansion of present plant design. The decrease of water treatment plants design capacity is due to the closing of plants and temporary closure of water treatment plant (will be reopened when needed)

Jadual 2.9: Pengeluaran air yang dibekalkan mengikut negeri, Sarawak, 2020-2024

Table 2.9: Production of water supplied by state, Sarawak, 2020-2024

Juta liter sehari (JLH)
Million litres per day (MLD)

Negeri State	2020	2021	2022	2023	2024
Sarawak ¹	1,693	1,767	1,881	1,956	1,973

Sumber: Kementerian Peralihan Tenaga dan Transformasi Air,
Suruhanjaya Perkhidmatan Air Negara

Source: Ministry of Energy Transition and Water Transformation
National Water Services Commission

Nota/ Notes:

¹Termasuk LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Lembaga Air Sibu, Lembaga Air Kuching dan Jabatan Bekalan Air Luar Bandar (JBALB) Sarawak

Includes LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Sibu Water Board, Kuching Water Board and Sarawak Rural Water Supply Department (JBALB)

Jadual 2.10: Bekalan air mentah diabstrak dari sungai, empangan dan air bawah tanah, Sarawak¹, 2020-2024

Table 2.10: Supply of abstracted raw water from rivers, dams and groundwater, Sarawak, 2020-2024

Juta liter sehari (JLH)
Million litres per day (MLD)

Tahun Year	2020	2021	2022	2023	2024
Sungai Rivers	1,632 ^r	1,727 ^r	1,749 ^r	1,776	1,891
Empangan Dams	220	225	231	298	232
Air bawah tanah ² Groundwater	0.4	0.4	0.4	2.2	2.0

Nota/ Notes:

¹ Termasuk LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Lembaga Air Sibu, Lembaga Air Kuching dan Jabatan Bekalan Air Luar Bandar (JBALB) Sarawak

Includes LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Sibu Water Board, Kuching Water Board and Sarawak Rural Water Supply Department (JBALB)

² Sumber air bawah tanah tidak diterokai di kawasan yang air dibekalkan oleh Jabatan Bekalan Air Luar Bandar (JBALB), Sarawak, Lembaga Air Kuching dan Lembaga Air Sibu. Kos mengepam air bawah tanah adalah tinggi. Air bawah tanah kini disimpan untuk musim kemarau

Groundwater resources not explored in areas water supplied by Sarawak Rural Water Supply Department (JBALB), Kuching Water Board and Sibu Water Board Pumping groundwater is costly. The groundwater resource is presently stored as a reserve for the drought season

Jadual 2.11: Penggunaan air bermeter mengikut sektor, Sarawak, 2020-2024

Table 2.11: Metered water consumption by sector, Sarawak, 2020-2024

Juta liter sehari (JLH)
Million litres per day (MLD)

Negeri State	Sektor Sector									
	Domestik Domestic					Bukan domestik Non-domestic				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
Sarawak	548	579	602	624	599	448	440	463	572	586

Nota/ Notes:

Termasuk LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Lembaga Air Sibu, Lembaga Air Kuching dan Jabatan Bekalan Air Luar Bandar (JBALB) Sarawak

Includes LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Sibu Water Board, Kuching Water Board and Sarawak Rural Water Supply Department (JBALB)

**Sumber: Kementerian Peralihan Tenaga dan Transformasi Air,
Suruhanjaya Perkhidmatan Air Negara**

*Source: Ministry of Energy Transition and Water Transformation
National Water Services Commission*

Jadual 3.1: Senarai dan kapasiti kemudahan rawatan dan pelupusan sisa perbandaran, Sarawak, 2024

Table 3.1: List and capacity of municipal waste treatment and disposal facilities, Sarawak, 2024

Tapak Pelupusan <i>Disposal site</i>			Loji rawatan termal <i>Thermal treatment plant</i>		
Nama tapak <i>Site name</i>	Kapasiti muatan sisa sehari (tan/ hari) <i>Residual load capacity daily (tonnes/day)</i>	Luas (Hektar) <i>Area (Hectares)</i>	Nama loji <i>Plant name</i>	Kapasiti muatan sisa sehari (tan/ hari) <i>Residual load capacity daily (tonnes/day)</i>	Luas (Hektar) <i>Area (Hectares)</i>
TP Bau	60.0	3.6	-	-	-
TP Lidong	30.0	1.0	-	-	-
TP Pusa	6.0	0.3	-	-	-
TP Spaoh	6.0	0.3	-	-	-
TP Debak	6.0	0.4	-	-	-
TP Meludam	48.0	n/a	-	-	-
TP Dalat	35.0	0.6	-	-	-
TP Balingian	25.0	1.0	-	-	-
TP Perawan	11.0	1.4	-	-	-
TP Kapit	50.0	2.5	-	-	-
TP Song	20.0	1.5	-	-	-
TP Belaga	15.0	1.5	-	-	-
TP Sg. Asap	15.0	2.5	-	-	-
TPS Mambong	450.0	112.0	-	-	-
TP Lawas	20.0	6.1	-	-	-
TP Kidurong	150.0	4.1	-	-	-
TP Ulu Segan	335.0	8.0	-	-	-
TP Limbang	50.0	4.5	-	-	-
TP Selangau	6.0	2.0	-	-	-
TP Stapang	4.0	3.7	-	-	-
TP Lubok Antu	5.0	0.8	-	-	-
TP Engkilili	5.0	1.2	-	-	-
TP Lundu	16.0	3.7	-	-	-
TP Julau	8.0	2.0	-	-	-
TP Pakan	8.0	2.0	-	-	-
TP Meradong	16.0	1.0	-	-	-
TP Gemuan	n/a	n/a	-	-	-
TP Marudi	25.0	1.5	-	-	-
TP Long Lama	5.0	2.7	-	-	-
TP Daro	6.0	1.0	-	-	-
TP Kuala Matu	5.0	0.8	-	-	-
TP Belawai	5.0	4.0	-	-	-
TPS Sibuti	136.0	4.6	-	-	-
TP Kuala Baram	40.0	7.5	-	-	-
TP Samarahan	120.0	2.3	-	-	-
TPS Seratok	12.0	0.3	-	-	-
TP Roban	5.0	0.8	-	-	-
TP Selalang	56.0	4.5	-	-	-
TP Batu 8	9.6	0.8	-	-	-
TP Tebedu	2.4	0.1	-	-	-

Jadual 3.1: Senarai dan kapasiti kemudahan rawatan dan pelupusan sisa perbandaran, Sarawak, 2024 (samb.)

Table 3.1: List and capacity of municipal waste treatment and disposal facilities, Sarawak, 2024 (cont'd)

Tapak Pelupusan Disposal site			Loji rawatan termal Thermal treatment plant		
Nama tapak Site name	Kapasiti muatan sisa sehari (tan/ hari) Residual load capacity daily (tonnes/day)	Luas (Hektar) Area (Hectares)	Nama loji Plant name	Kapasiti muatan sisa sehari (tan/ hari) Residual load capacity daily (tonnes/day)	Luas (Hektar) Area (Hectares)
TPS Kemunyang	121.0	5.5	-	-	-
TP Jln. Seng Ling	100.0	25.0	-	-	-
TP Simunjan	30.0	2.1	-	-	-
TP Pantu	4.0	0.6	-	-	-
TP Entulang	75.0	1.2	-	-	-
TP Lingga	4.0	1.4	-	-	-

Nota/ Notes:

TP: Tapak pelupusan bukan sanitari/ Non-sanitary landfill

TPS: Tapak pelupusan sanitari/ Sanitary landfill

TPI: Tapak pelupusan lengai/ Inert landfill

LRT: Loji Rawatan Termal/ Thermal treatment plant (Incinerator)

Sumber: Kementerian Perumahan dan Kerajaan Tempatan

Source: Ministry of Housing and Local Government

Jadual 3.2: Bilangan kemudahan rawatan dan pelupusan sisa perbandaran, Sarawak, 2024

Table 3.2: Number of municipal waste treatment and disposal facilities, Sarawak, 2024

Tapak pelupusan di bawah seliaan SWCorp Disposal site under SWCorp	Tapak pelupusan bukan di bawah seliaan SWCorp Disposal site not under SWCorp
-	46

Sumber: Kementerian Perumahan dan Kerajaan Tempatan

Source: Ministry of Housing and Local Government

Jadual 3.3: Buangan terjadual, Sarawak, 2020-2024

Table 3.3: Scheduled waste, Sarawak, 2020-2024

Tahun Year	2020	2021	2022	2023	2024
Kuantiti Quantity	499,489	540,595	548,561	637,060	421,708

Tan metrik
Metric tonnes

Sumber: Jabatan Alam Sekitar

Source: Department of Environment

Jadual 3.4: Kuantiti buangan klinikal, Sarawak, 2020-2024

Table 3.4: Quantity of clinical waste, Sarawak, 2020-2024

Tan metrik
Metric tonnes

Tahun Year	2020	2021	2022	2023	2024
Kuantiti Quantity	4,105.0	8,265.6	4,731.9	4,951.4	5,002.3

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Jadual 3.5: Bilangan tapak pelupusan sisa pepejal yang beroperasi, Sarawak, 2020-2024

Table 3.5: Number of operating solid waste landfills, Sarawak, 2020-2024

Tahun Year	Sanitari Sanitary	Bukan sanitari Non sanitary	Lengai Inert
2020	3	43	-
2021	3	43	-
2022	3	43	-
2023	3	43	-
2024	3	43	-

Sumber: Kementerian Perumahan dan Kerajaan Tempatan
Source: Ministry of Housing and Local Government

Jadual 4.1: Kejadian bencana, Sarawak, 2020-2024

Table 4.1: Disaster events, Sarawak, 2020-2024

Tahun Year	Bilangan kejadian Number of events	Mangsa Victim	Keluarga Family	Pusat pemindahan Evacuation center	Kematian Death	Rumah rosak House damaged
2020	4	626	182	5	-	-
2021	6	9,217	2,407	105	-	-
2022	9	1,923	525	30	-	-
2023	10	1,552	393	18	-	-
2024	12	3,000	786	30	1	-

Sumber: Agensi Pengurusan Bencana Negara

Source: National Disaster Management Agency

Nota: Bilangan kejadian bencana adalah berdasarkan keluarga dan mangsa yang dengan bencana dan telah ditempatkan di Pusat Pemindahan Sementara (PPS)

Notes: Number of disaster events is based on families and victims affected by disaster and placed at the Temporary Evacuation Centers (PPS)

Jadual 4.2: Bilangan kejadian banjir yang dilaporkan, Sarawak, 2020-2024

Table 4.2: Number of flood incidents reported, Sarawak, 2020-2024

Tahun Year	2020	2021	2022	2023	2024
Bilangan Number	225	270	242	161	459

Sumber: Jabatan Pengairan dan Saliran

Source: Department of Irrigation and Drainage

Jadual 4.3: Bilangan kemalangan jalan raya dan kecederaan yang dilaporkan, Sarawak, 2020-2024

Table 4.3: Number of road accidents and casualties reported, Sarawak, 2020-2024

Tahun Year	Kemalangan jalan raya Road accidents	Kecederaan Casualties		Jumlah Total
		Kecederaan ¹ Injury	Kematian Death	
2020	16,158	503	315	818
2021	14,231	554	326	880
2022	19,508	662	387	1,049
2023	21,417	477	378	855
2024	21,733	507	408	915

Sumber: Jabatan Siasatan dan Penguatkuasaan Trafik, Polis Diraja Malaysia

Source: Investigation and Enforcement of the Traffic Department, Royal Malaysian Police

Nota: ¹Kecederaan merujuk kepada kecederaan ringan dan parah

Notes: Injury refer to minor and serious injuries

Jadual 4.4: Bilangan kejadian kebakaran, Sarawak, 2020-2024

Table 4.4: Number of fire incidents, Sarawak, 2020-2024

Tahun Year	2020	2021	2022	2023	2024
Bilangan Number	1,632	1,975	1,644	2,096	2,176

Sumber: Kementerian Perumahan dan Kerajaan Tempatan
Source: Ministry of Housing and Local Government

Jadual 4.5: Bilangan kematian, kecederaan dan anggaran kerugian akibat kebakaran yang dilaporkan, Sarawak, 2020-2024

Table 4.5: Number of deaths, injuries and estimated losses caused by fire reported, Sarawak, 2020-2024

Tahun Year	Kematian Death	Kecederaan Injury	Kerugian (RM juta) Loss (Millions)
2020	13	16	63.7
2021	2	23	309.5
2022	22	39	74.9
2023	11	33	163.7
2024	11	51	199.9

Sumber: Kementerian Perumahan dan Kerajaan Tempatan
Source: Ministry of Housing and Local Government

Jadual 4.6: Statistik nilai kerugian banjir, Sarawak, 2022 dan 2023

Table 4.6: Statistics on value of flood losses, Sarawak, 2022 and 2023

Negeri State	*Bilangan tempat kediaman Number of living quarters	Nilai kerugian banjir Value of flood losses					
		(A) Tempat Kediaman Living quarters (RM '000)		(B) Kenderaan Vehicles (RM '000)		(C) Premis Perniagaan Business Premises (RM '000)	
		2022	2023	2022	2023	2022	2023
Malaysia	8,046,946	168,258	372,232	22,327	17,298	53,197	54,059
Sarawak	618,018	329	2,199	25	192	18	168

Negeri State	Nilai kerugian banjir Value of flood losses						Jumlah kerugian Total loss (RM '000)	
	(D) Pembuatan Manufacturing (RM '000)		(E) Pertanian Agriculture (RM '000)		(F) Infrastruktur Infrastructure (RM '000)			
	2022	2023	2022	2023	2022	2023	2022	2023
	2022	2023	2022	2023	2022	2023	2022	2023
Malaysia	10,260	1,163	120,629	185,222	380,742	303,380	755,413	933,354
Sarawak	-	-	197	518	29,215	24,280	29,784	27,357

Nota: * Bilangan Tempat Kediaman merujuk kepada data Banci Penduduk dan Perumahan Malaysia 2020.

Notes: Number of Living Quarters refers to the data of Population and Housing Census Malaysia 2020.

"-" Tidak terkesan banjir
Not affected by the flood

Data mengikut negeri bagi Pertanian dan Infrastruktur bagi tahun 2021 tidak diterbitkan
Data by state for Agriculture and Infrastructure for year 2021 were not published

"n.a" - Data tidak tersedia
Data not available

Jadual 4.7: Taburan kawasan hakisan pantai, Sarawak, 2024

Table 4.7: Distribution of coastal erosion areas, Sarawak, 2024

Panjang (km)
Length

Negeri State	Jumlah (km) Total	Pantai yang mengalami hakisan mengikut kategori Coastal erode by category						Jumlah hakisan (km) Total erosion	%
		Kategori 1 Category 1		Kategori 2 Category		Kategori 3 Category			
		Bil. kawasan No. of area	Panjang agregat (km) Aggregate length	Bil. kawasan No. of area	Panjang agregat (km) Aggregate length	Bil. kawasan No. of area	Panjang agregat (km) Aggregate length		
Malaysia	8,840.00	44	55.4	309	375.9	2,344	916.3	1,347.60	15.2
Sarawak	1,234.10	7	18.6	78	144.8	566	329.1	492.5	39.9

Sumber: Jabatan Pengairan dan Saliran
Source: Department of Irrigation and Drainage

Nota/ Notes:

Kategori 1: Pengunduran garis pantai yang cepat dengan kadar melebihi 4 meter/ tahun umumnya di kawasan dengan penduduk yang agak padat bersama aktiviti komersial/industri yang mendapat perkhidmatan infrastruktur dan kemudahan awam.

Category 1: Fast retreating coastline at the rate of more than 4 metre/ year with generally fairly dense human settlement, with some commercial/ industrial activities being served by significant public infrastructure and facilities.

Kategori 2: Pengunduran garis pantai dengan kadar lebih dari 1 meter/ tahun tetapi kurang dari 4 meter/tahun umumnya di kawasan berpenduduk tidak padat dengan sedikit aktiviti pertanian yang mendapat perkhidmatan infrastruktur dan kemudahan awam yang kurang sempurna.

Category 2: Retreating coastline at the rate of between more than 1 metre/ year but less than 4m/ year with generally sparsely-populated area, with some agricultural activities being served by relatively minor public infrastructure and facilities

Kategori 3: Pengunduran garis pantai dengan kadar kurang dari 1 meter/ tahun umumnya di kawasan tanpa penduduk dengan aktiviti pertanian yang minimum yang tidak mendapat perkhidmatan infrastruktur dan kemudahan awam.

Category 3: Slowly retreating coastline of less than 1 metre/ year with generally no human settlement and minimal agricultural activities, and not served by public infrastructure and facilities.

Berdasarkan *National Coastal Erosion Study for Malaysia (2015)*
Based on *National Coastal Erosion Study for Malaysia (2015)*

Jadual 5.1: Anggaran penduduk pertengahan tahun, Sarawak, 2021-2025

Table 5.1: Mid-year population estimates, Sarawak, 2021-2025

Tahun Year	2021	2022	2023	2024	2025 ^p	Kadar pertumbuhan penduduk tahunan Annual population growth rate (%)	
	('000)					2023/2024	2024/2025
Penduduk Population	2,465.6	2,473.5	2,502.3	2,517.5	2,529.8	0.6	0.5

Nota/ Notes :**Berdasarkan Anggaran Penduduk Pertengahan Tahun berasaskan data Banci Penduduk dan Perumahan 2020***Mid-Year Population Estimates based on Population and Housing Census of Malaysia 2020*^p **Permulaan/ Preliminary****Hasil tambah mungkin berbeza kerana pembundaran***The added total may differ due to rounding***Jadual 5.2: Kepadatan penduduk, Sarawak, 2021-2025**

Table 5.2: Population density, Sarawak, 2021-2025

Tahun Year	2021	2022	2023	2024	2025 ^p	Bilangan orang bagi setiap km ² Number of persons per km ²	
Kepadatan penduduk Population density	20	20	20	20	20		

Nota/ Notes :**Berdasarkan Anggaran Penduduk Pertengahan Tahun berasaskan data Banci Penduduk dan Perumahan 2020***Mid-Year Population Estimates based on Population and Housing Census of Malaysia 2020*^p **Permulaan/ Preliminary****Hasil tambah mungkin berbeza kerana pembundaran***The added total may differ due to rounding*

Jadual 5.3: Penduduk dengan air paip yang dirawat mengikut strata, Sarawak, 2021-2024

Table 5.3: Population with treated piped water by state, Sarawak, 2021-2024

Tahun Year	2021			2022			2023			2024		
Strata	Bandar Urban	Luar bandar Rural	Purata negeri State average	Bandar Urban	Luar bandar Rural	Purata negeri State average	Bandar Urban	Luar bandar Rural	Purata negeri State average	Bandar Urban	Luar bandar Rural	Purata negeri State average
Peratus Per cent	99.0	66.9	83.6	99.0	67.2	83.7	99.0	68.2	84.3	99.0	70.5	85.4

Nota/ Notes:

Termasuk LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Lembaga Air Sibu, Lembaga Air Kuching dan Jabatan Bekalan Air Luar Bandar (JBALB), Sarawak. Angka bagi kawasan luar bandar Sarawak tidak termasuk bekalan air separa terawat yang dibekalkan oleh agensi lain seperti Kementerian Kemajuan Luar Bandar dan Wilayah, Kementerian Kesihatan dan bekalan air persendirian

Includes LAKU Management Sdn. Bhd. (Bintulu, Miri & Limbang), Sibu Water Board, Kuching Water Board and Sarawak Rural Water Supply Department. Figures for the rural areas of Sarawak exclude partly treated portable water supplied by the other agencies such as Ministry of Rural and Regional Development, Ministry of Health and private water supply

Jadual 5.4: Kadar tarif air bagi domestik, Sarawak, 2024

Table 5.4 : Water tariff rates for domestic, Sarawak, 2024

RM/m³

Negeri State	Semakan tarif terakhir Last tariff review	Purata tarif air Average water tariff		
		20m ³ pertama first 20m ³	30m ³ pertama first 30m ³	35m ³ pertama first 35m ³
Sarawak ¹	1992	0.54	0.60	0.62
Sarawak ²	1995	0.51	0.55	0.56
Sarawak ³	1984	0.49	0.55	0.56

Nota/ Notes:

¹ Termasuk Sibu, Kuching, Sri Aman, Limbang, Sarikei, Kapit dan Miri

Includes Sibu, Kuching, Sri Aman, Limbang, Sarikei, Kapit and Miri

² Termasuk Bintulu

Includes Bintulu

³ Bahagian lain Sarawak

Other parts of Sarawak

Sumber: Kementerian Peralihan Tenaga dan Transformasi Air, Suruhanjaya Perkhidmatan Air Negara

Source: Ministry of Energy Transition and Water Transformation, National Water Services Commission

Jadual 5.5: Kadar tarif air bagi industri, Sarawak, 2024

Table 5.5 : Water tariff rates for industry, Sarawak, 2024

RM/m³

Negeri State	Semakan tarif terakhir Last tariff review	Purata tarif air Average water tariff		
		80m ³ pertama first 80m ³	120m ³ pertama first 120m ³	500m ³ pertama first 500m ³
Sarawak ¹	1992	1.26	1.28	1.32
Sarawak ²	1995	1.17	1.18	1.20
Sarawak ³	1984	1.12	1.15	1.19

Sumber: Kementerian Peralihan Tenaga dan Transformasi Air,
Suruhanjaya Perkhidmatan Air Negara

Source: Ministry of Energy Transition and Water Transformation,
National Water Services Commission

Nota/ Notes:

¹ Termasuk Sibu, Kuching, Sri Aman, Limbang, Sarikei, Kapit dan Miri
Includes Sibu, Kuching, Sri Aman, Limbang, Sarikei, Kapit and Miri

² Termasuk Bintulu
Includes Bintulu

³ Bahagian lain Sarawak
Other parts of Sarawak

Jadual 5.6: Peratus isi rumah dengan kemudahan bekalan elektrik mengikut strata, Sarawak, 2022

Table 5.6: Percentage of households with the accessibility to electricity supply by strata, Sarawak, 2022

	Kemudahan bekalan elektrik Accessibility to electricity supply		
	Jumlah Total	Bandar Urban	Luar bandar Rural
Malaysia	99.7	99.9	99.0
Sarawak	97.8	99.3	95.6

Nota: Berdasarkan Laporan Survei Kemudahan Asas 2022

Notes: Based on Basic Amenities Survey Report 2022

Jadual 5.7: Tarif elektrik, Sarawak

Table 5.7: Electricity tariff, Sarawak

Kategori tarif <i>Tariff category</i>	Kadar per unit <i>Rate per unit</i>
Tarif D - Kediaman <i>Tariff D - Domestic</i>	
1 - 100 unit <i>units</i>	18.0 sen
1 - 150 unit <i>units</i>	18.0 sen
1 - 200 unit <i>units</i>	22.0 sen
1 - 300 unit <i>units</i>	25.0 sen
1 - 400 unit <i>units</i>	27.0 sen
1 - 500 unit <i>units</i>	29.5 sen
1 – 700 unit <i>units</i>	30.0 sen
1 - 800 unit <i>units</i>	30.5 sen
1 - 1,300 unit <i>units</i>	31.0 sen
Melebihi 1,300 unit <i>Above 1,300 units</i>	31.5 sen
Caj minimum bulanan <i>Minimum monthly charge</i>	RM5.00
Tarif C1 - Komersil <i>Tariff C1 - Commercial</i>	
1 - 100 unit <i>units</i>	20.0 sen
1 - 200 unit <i>units</i>	24.0 sen
1 - 300 unit <i>units</i>	26.0 sen
1 - 400 unit <i>units</i>	28.0 sen
1 - 500 unit <i>units</i>	30.0 sen
1 - 3,000 unit <i>units</i>	31.5 sen
1 - 10,000 unit <i>units</i>	32.0 sen
1 - 20,000 unit <i>units</i>	31.0 sen

Jadual 5.7: Tarif elektrik, Sarawak (samb.)

Table 5.7: Electricity tariff, Sarawak (cont'd)

Kategori tarif Tariff category	Kadar per unit Rate per unit
Tarif C1 - Komersil <i>Tariff C1 - Commercial</i>	
1 - melebihi 20,000 unit 1 - above 20,000 units	30.0 sen
Caj minimum bulanan Minimum monthly charge	RM10.00
Tarif C2 - Kehendak perdagangan <i>Tariff C2 - Commercial demand</i>	
Semua penggunaan All consumption	24.5 sen
Bagi setiap kilowatt kehendak maksimum sebulan For each kilowatt of maximum demand per month	RM16.00
Caj minimum bulanan Minimum monthly charge	RM 16.00 per kilowatt x kehendak bil RM 16.00 per kilowatt x billing demand
Tarif C3 - Kehendak waktu puncak/bukan waktu puncak perdagangan <i>Tariff C3 - Commercial peak/off-peak demand</i>	
Bagi setiap unit waktu puncak For each unit during the peak period	24.5 sen
Bagi setiap unit bukan waktu puncak For each unit during the off-peak period	13.9 sen
Bagi setiap kilowatt kehendak maksimum sebulan semasa waktu puncak For each kilowatt of maximum demand per month during the peak period	RM20.00
Caj minimum bulanan Minimum monthly charge	RM 20.00 per kilowatt x kehendak bil RM 20.00 per kilowatt X billing demand

Sumber: Sarawak Energy Berhad
Source: Sarawak Energy Berhad

Jadual 5.8: Penjanaan tenaga elektrik mengikut kawasan dan stesen, Sarawak, 2020-2024

Table 5.8: Electricity generated by region and station, Sarawak, 2020-2024

Tahun Year	Stesen wap Steam stations	Stesen diesel Diesel stations	Stesen hidro Hydro stations	Turbin gas Gas turbines	Lain-lain ¹ Others	Jumlah Total
2020	0	156.2	21,622.20	4,615.30	3,273.70	29,667.40
2021	0	156.7	23,200.90	5,038.60	3,802.30	32,198.60
2022	0	157.3	24,198.30	6,226.40	4,147.40	34,729.40
2023	0	195.4	25,077.20	7,115.20	4,260.50	36,648.30
2024 ^p	0	199	26,135.60	5,967.80	4,392.70	36,695.10

Sumber: Sarawak Energy Berhad dan Pengeluar Tenaga Bebas
Source: Sarawak Energy Berhad and Independent Power Producer

Nota: Nilai 0.0 merujuk kepada kurang daripada setengah unit terkecil yang ditunjukkan

Notes: 0.0 value refers to less than half the smallest unit shown

Jadual 5.9: Bilangan ketibaan dan pelepasan kapal laut yang terlibat dalam perdagangan antarabangsa, Sarawak, 2019-2023

Table 5.9: Number of arrivals and departures of ocean-going vessel engaged in foreign trade at selected ports, Sarawak, 2019-2023

Pelabuhan Port	Ketibaan Arrivals					Berlepas Departures				
	2019	2020	2021	2022	2023 ^e	2019	2020	2021	2022	2023 ^e
Bintulu	2,126	1,955	1,536	1,477	7,619	2,322	2,104	1,517	1,492	7,634
Kuching	1,180	1,160	458	492	1,351	983	826	458	493	1,359
Miri	702	483	192	84	9,600	790	545	189	81	9,588
Rajang ¹	497	382	-	-	435	421	350	-	-	405

Nota: ¹ Termasuk Sibul, Bintangor, Sarikei dan Tanjung Manis

Notes: Includes Sibul, Bintangor, Sarikei and Tanjung Manis

Sumber: Jabatan Laut Malaysia

Source: Malaysia Marine Department

Jadual 5.10: Kargo yang dikendalikan mengikut pelabuhan, Sarawak, 2020-2024

Table 5.10: Cargo throughput by port, Sarawak, 2020-2024

Tan metrik (berat muatan) '000
Metric tonnes (freightweight)

Pelabuhan Port		2020	2021	2022	2023	2024
Bintulu	Jumlah Total	41,499	37,072	41,956	41,751	44,241
	Import Imports	4,245	4,083	4,783	4,943	5,710
	Eksport Exports	37,254	32,989	37,173	36,808	38,531
Miri	Jumlah Total	3,496	3,218	3,366	3,119	3,201
	Import Imports	595	564	488	490	564
	Eksport Exports	2,901	2,654	2,877	2,629	2,637
Kuching	Jumlah Total	8,197	8,892	9,869	9,349	9,962
	Import Imports	6,206	7,202	8,327	7,890	8,482
	Eksport Exports	1,991	1,690	1,543	1,459	1,479
Rajang	Jumlah Total	1,360	1,412	1,493	1,411	1,478
	Import Imports	1,058	1,165	1,247	1,174	1,223
	Eksport Exports	302	247	246	237	254

Nota: Tidak termasuk pindah kapal

Notes: Excluding trans-shipment

Sumber: Kementerian Pengangkutan

Source: Ministry of Transport

Jadual 5.11: Kadar insiden keracunan makanan, kolera dan tifoid, Sarawak, 2020-2024

Table 5.11: Incidence rate of food poisoning, cholera and typhoid, Sarawak, 2020-2024

Bagi setiap 100,000 penduduk
Per 100,000 population

Insiden Incidence	2020	2021	2022	2023	2024
Keracunan makanan Food poisoning	13.9	6.0	20.0	31.1	34.1
Kolera Cholera	-	-	-	-	-
Tifoid ¹ Typhoid	0.0	0.6	0.3	0.1	0.2

Nota: ¹ Mulai tahun 2019, penyakit Tifoid termasuk Paratyphi

Notes: Starting from year 2019, Typhoid also include Paratyphi

Nilai 0.0 merujuk kepada kurang daripada setengah unit terkecil yang ditunjukkan

0.0 value refers to less than half the smallest unit shown

Jadual 5.12: Bilangan kes demam denggi, demam denggi berdarah dan malaria, Sarawak, 2020-2024

Table 5.12: Number of dengue fever, dengue haemorrhagic fever and malaria cases, Sarawak, 2020-2024

Kes Cases	2020	2021	2022	2023	2024
Demam denggi Dengue fever	1,511	425	666	1,091	1,755
Demam denggi berdarah Dengue haemorrhagic fever	5	1	5	-	6
Malaria	862	1,057	738	818	599

Sumber: Kementerian Kesihatan Malaysia

Source: Ministry of Health Malaysia

Jadual 6.1: Perbelanjaan perlindungan alam sekitar mengikut jenis perbelanjaan, Sarawak, 2018-2022

Table 6.1: Environmental protection expenditure by type of expenditure, Sarawak, 2018-2022

RM '000

Negeri States	Tahun Year	Jumlah Total	Pengurusan pencemaran Pollution management	Perlindungan hidupan liar & habitat Protection of wildlife & habitats	Penilaian dan caj alam sekitar Environmental assessment and charges	Pengurusan sisa Waste management	Perbelanjaan lain untuk perlindungan alam sekitar Other environmental protection expenditure
Jumlah Total	2018	100,026	67,330	2,709	6,824	22,013	1,150
	2019	251,732	150,348	1,471	5,551	90,865	3,497
	2020	235,613	138,970	815	9,068	85,902	858
	2021	239,412	137,636	543	14,045	84,967	2,222
	2022	258,780	144,906	981	14,678	92,000	6,215
Modal Capital	2018	46,254	44,894	14	529	306	512
	2019	72,579	71,224	25	762	446	122
	2020	77,870	71,420	13	5,435	879	122
	2021	79,784	67,489	8	3,765	8,521	1
	2022	64,113	57,299	-	3,758	2,866	190
Operasi Operation	2018	164,385	86,770	720	3,236	71,600	2,060
	2019	179,153	19,123	1,447	4,789	90,419	3,375
	2020	157,743	67,549	802	3,633	85,023	736
	2021	159,628	70,147	535	10,280	76,445	2,222
	2022	194,667	87,607	381	10,920	89,133	6,025

Nota: Berdasarkan kepada Survei Ekonomi Tahunan 2022 - Perbelanjaan Perlindungan Alam Sekitar

Notes: Based on the Annual Economic Survey 2022 - Environmental Protection Expenditure

Jadual 6.2: Peruntukan dan perbelanjaan pembangunan hutan, Sarawak, 2019-2023

Table 6.2: Forest development allocation and expenditure, Sarawak, 2019-2023

RM juta
RM million

Bidang Kuasa Jurisdiction	Perkara Items	2019	2020	2021	2022	2023
Jumlah Total	Peruntukan Allocation	36.90	13.00	21.59	26.64	28.89
	Perbelanjaan Expenditure	22.60	6.70	12.86	18.36	27.84
Negeri State	Peruntukan Allocation	18.80	3.10	12.62	16.12	8.94
	Perbelanjaan Expenditure	6.20	1.30	4.28	8.04	8.47
Persekutuan Federal	Peruntukan Allocation	18.20	9.90	8.97	10.52	19.95
	Perbelanjaan Expenditure	16.30	5.40	8.58	10.32	19.37

Sumber: Jabatan Hutan Sarawak
Source: Forest Department Sarawak

Jadual 6.3: Pembangunan sumber hutan, Sarawak, 2019-2023Table 6.3: *Forest resource development, Sarawak, 2019-2023*

	Hektar Hectares				
Sumber Source	2019	2020	2021	2022	2023
Ladang hutan Forest plantation	19,274	13,855	18,495	13,817	27,933
Tanaman bakau Mangroves	5	5	19	71	61
Tanaman kawasan pantai (bilangan pokok) Coastal plantation (number of trees)	3,128	2,899	20,774	109,197	142,788

Sumber: Jabatan Hutan Sarawak
Source: Forest Department Sarawak



LAMPIRAN

APPENDICES

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank

**Framework for the Development of Environment Statistics (FDES) dan hubung kait dengan rangka kerja
Daya Penggerak-Tekanan-Keadaan-Impak-Respon (DPSIR)**

The FDES and its relationship with the Driving Force-Pressure-State-Impact-Response (DPSIR) framework



Daya Penggerak: Sosio-ekonomi dan sosio-kultur yang memacu aktiviti manusia bagi meningkatkan atau mengurangkan tekanan terhadap alam sekitar

Driving Force: The socioeconomic and sociocultural forces driving human activities, which increase or mitigate pressures on the environment

Tekanan: Tekanan aktiviti manusia kepada alam sekitar
Pressure: The stresses that human activities place in the environment

Keadaan: Situasi terkini alam sekitar
State: The current condition of the environment

Impak: Kesan degradasi alam sekitar
Impact: The effects of environmental degradation

Respon: Tindak balas oleh masyarakat terhadap keadaan alam sekitar
Response: Responses by society to the environmental situation

Sumber: Framework for the Development of Environment Statistics (FDES 2013)
Source:

Punca dan kesan bahan pencemar udara kepada manusia dan tumbuhan*Sources and effects of air pollutants on human and plants*

Bahan pencemar udara <i>Air pollutant</i>	Punca <i>Source</i>	Kesan kepada kesihatan manusia dan ekologi <i>Human health and ecological effects</i>
Ozon (O ₃) <i>Ozone</i>	Motosikal dua lejang, kenderaan bermotor dan punca-punca industri. <i>Two-stroke motorcycles, motor vehicles and industrial sources.</i>	Manusia/ Human Menjejaskan fungsi pernafasan dan penurunan prestasi atlet yang melakukan senaman lasak dan bahaya penyakit barah kulit <i>Impairment of respiratory function and decreasing performance by some athletes exercising heavily and skin cancer risks</i> Tumbuhan/ Plants Memusnahkan tumbuhan dan mengurangkan pengeluaran tanaman <i>Damage vegetation and reduces crop production</i>
Plumbum (Pb) <i>Lead</i>	Sektor pengangkutan <i>Transport sector</i>	Manusia/ Human Pendedahan yang berlarutan boleh mengakibatkan gangguan sistem saraf <i>Long-term exposure can lead to nervous disorders</i>
Karbon Monoksida (CO) <i>Carbon Monoxide</i>	Sektor pengangkutan <i>Transport sector</i>	Manusia/ Human Menjejaskan mereka yang merokok dan yang menghidap masalah peredaran darah dan anemia <i>Affects smokers and people with circulatory and anaemic problems</i>
Sulfur Dioksida (SO ₂) <i>Sulphur Dioxide</i>	Industri minyak dan gas, pengeluaran tenaga, pembakaran arang, proses industri dan industri berasaskan pembakaran <i>Oil and gas industry, energy production, coal burning, industrial combustion and industrial process</i>	Manusia/ Human Menambahkan derita pesakit yang menghidap asma dan bronkitis <i>Aggravates asthmatic and bronchitis patients</i> Tumbuhan/Plants Memusnahkan tumbuhan <i>Damages vegetation</i>
Nitrogen Dioksida (NO ₂) <i>Nitrogen Dioxide</i>	Pengangkutan, penjanaan kuasa dan industri berasaskan pembakaran <i>Transport, power generation and industrial combustion</i>	Manusia/ Human Menjejaskan fungsi pernafasan <i>Affects respiratory function</i> Tumbuhan/ Plants Menyekat pertumbuhan tanaman <i>Suppresses vegetation growth</i>
Habuk Halus (PM ₁₀) <i>Particulate Matter</i>	Pembakaran terbuka <i>Open burning</i>	Manusia/ Human Melemahkan fungsi pernafasan <i>Impairs respiratory function</i> Tumbuhan/ Plants Memusnahkan tumbuhan <i>Damages vegetation</i>

Sumber: Kementerian Kesihatan Malaysia
Source: Ministry of Health Malaysia

Perbandingan nilai IPU dengan tahap pencemaran dan kawalan kesihatan*Comparison of API values with level of pollution and health measures*

Indeks Pencemaran Udara (IPU) <i>Air Pollutant Index (API)</i>	Status	Tahap pencemaran <i>Level of pollution</i>	Kawalan kesihatan <i>Health measures</i>
0 – 50	Baik	Pencemaran rendah yang tidak ada kesan buruk terhadap kesihatan	Tidak ada sekatan aktiviti bagi semua lapisan orang. Amalkan gaya hidup yang sihat seperti tidak merokok, kerap bersenam dan mengamalkan pemakanan yang sesuai
	Good	<i>Low pollution and has no ill-effects on health</i>	<i>No restriction of activities for all groups of people. To practice healthy lifestyle e.g. not to smoke, exercise regularly and to observe proper nutrition</i>
51 – 100	Sederhana	Pencemaran sederhana dan tidak ada kesan buruk terhadap kesihatan	Tidak ada sekatan aktiviti bagi semua lapisan orang. Amalkan gaya hidup yang sihat seperti tidak merokok, kerap bersenam dan mengamalkan pemakanan yang sesuai
	Moderate	<i>Moderate pollution and has no ill-effects on health</i>	<i>No restriction of activities for all groups of people. To practice healthy lifestyle e.g. not to smoke, exercise regularly and to observe proper nutrition</i>
101 – 200	Tidak Sihat	Tanda-tanda sederhana yang menyebabkan bertambah teruk di kalangan orang berisiko tinggi, iaitu mereka yang menghidap sakit jantung dan paru-paru	Sekatan aktiviti kegiatan luar terhadap bagi orang yang berisiko tinggi. Penduduk amnya perlu mengurangkan aktiviti yang lasak
	Unhealthy	<i>Mild aggravation of symptoms among high risk persons, i.e. those with heart or lung disease</i>	<i>Restriction of outdoor activities for high risk persons. The population should reduce vigorous outdoor activity</i>
201 – 300	Sangat Tidak Sihat	Tanda-tanda ketara yang menyebabkan bertambah teruk dan toleransi senaman rendah di kalangan orang yang mengidap sakit jantung atau paru-paru	Warga tua dan orang yang menghidap penyakit jantung atau paru-paru dilarang keluar dan kurangkan aktiviti fizikal. Penduduk amnya mesti mengelakkan dari aktiviti luar yang lasak. Sesiapa yang menghadapi masalah kesihatan perlu merujuk kepada doktor
	Very Unhealthy	<i>Significant aggravation of symptoms and decreased exercise tolerance in person with heart or lung disease</i>	<i>Elderly and persons with known heart or lung disease should stay indoors and reduce physical activity. Population should avoid vigorous outdoor activity. Those with any health problems to consult a doctor</i>
301 – 500	Berbahaya	Tanda-tanda yang menyebabkan bertambah teruk dan membahayakan kesihatan	Warga tua dan orang yang menghidap penyakit jantung atau paru-paru dilarang keluar dan kurangkan aktiviti lasak. Penduduk amnya mesti menghindari aktiviti luar yang lasak
	Hazardous	<i>Severe aggravation of symptoms and endangers health</i>	<i>Elderly and persons with existing heart or lung disease should stay indoors and reduce physical activity. General population should avoid vigorous outdoor activity</i>
Melebihi 500	Kecemasan	Tanda-tanda yang menyebabkan bertambah teruk dan membahayakan kesihatan	Penduduk amnya dinasihatkan mengikut peraturan oleh Majlis Keselamatan Negara dan sentiasa mengikut pengumuman melalui media massa
Above 500	Emergency	<i>Severe aggravation of symptoms and endangers health</i>	<i>General population are advised to follow the orders of the National Security Council and follow the announcements through the mass media</i>

Sumber: Kementerian Kesihatan Malaysia
Source: Ministry of Health Malaysia

Klasifikasi kualiti air berdasarkan Indeks Kualiti Air*Water quality classification based on Water Quality Index*

Parameter	Indeks Index		
	Bersih (B) Clean (C)	Sederhana Tercemar (ST) Slightly Polluted (SP)	Tercemar (T) Polluted (P)
Indeks Kualiti Air (IKA) <i>Water Quality Index (WQI)</i>	81 – 100	60 – 80	0 – 59
Keperluan Oksigen Biokimia (BOD ₅) <i>Biochemical Oxygen Demand</i>	91 – 100	80 – 90	0 – 79
Ammoniakal Nitrogen (NH ₃ -N) <i>Ammoniacal Nitrogen</i>	92 – 100	71 – 91	0 – 70
Pepejal Terampai (SS) <i>Suspended Solids</i>	76 – 100	70 – 75	0 – 69

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Klasifikasi Indeks Kualiti Air*Water Quality Index classification*

Parameter	Unit	Kelas Class				
		I	II	III	IV	V
Ammoniakal Nitrogen (NH ₃ -N) <i>Ammoniacal Nitrogen</i>	mg/l	< 0.1	0.1 - 0.3	0.3 - 0.9	0.9 - 2.7	> 2.7
Keperluan Oksigen Biokimia (BOD ₅) <i>Biochemical Oxygen Demand</i>	mg/l	< 1	1 - 3	3 - 6	6 - 12	> 12
Keperluan Oksigen Kimia (COD) <i>Chemical Oxygen Demand</i>	mg/l	< 10	10 - 25	25 - 50	50 - 100	> 100
Oksigen Terlarut <i>Dissolved Oxygen</i>	mg/l	> 7	5 - 7	3 - 5	1 - 3	< 1
pH	-	> 7.0	6.0 - 7.0	5.0 - 6.0	< 5.0	< 5.0
Jumlah Pepejal Terampai (SS) <i>Total Suspended Solid</i>	mg/l	< 25	25 - 50	50 - 150	150 - 300	> 300
Indeks Kualiti Air (IKA) <i>Water Quality Index (WQI)</i>		> 92.7	76.5 - 92.7	51.9 - 76.5	31.0 - 51.9	< 31.0

Kelas air dan kegunaan*Water classes and uses*

Kelas Class	Kegunaan Uses
Kelas I Class I	Pemuliharaan alam semula jadi <i>Conservation of natural environment</i>
	Bekalan Air I – Hampir tiada rawatan diperlukan <i>Water Supply I – Practically no treatment necessary</i>
	Perikanan I – Spesis akuatik yang sangat sensitif <i>Fishery I – Very sensitive aquatic species</i>
Kelas IIA Class IIA	Bekalan Air II – Memerlukan rawatan secara konvensional sahaja <i>Water Supply II – Conventional treatment required</i>
	Perikanan II – Spesis akuatik yang sensitif <i>Fishery II – Sensitive aquatic species</i>
Kelas IIB Class IIB	Kegunaan rekreasi yang melibatkan persentuhan badan dengan air <i>Recreational use with body contact</i>
Kelas III Class III	Bekalan Air III – Memerlukan rawatan yang ekstensif <i>Water Supply III – Extensive treatment required</i>
	Perikanan III – Spesis tertentu yang mempunyai nilai ekonomi biasa Bekalan air minum haiwan ternakan <i>Fishery III – Tolerant species with common economic value</i> <i>Livestock drinking</i>
Kelas IV Class IV	Pengairan <i>Irrigation</i>
Kelas V Class V	Tiada seperti di atas. <i>None of the above</i>

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Standard dan kriteria kualiti air marin*Marine water quality criteria and standards*

	Parameter	KELAS 1 CLASS 1	KELAS 2 CLASS 2	KELAS 3 CLASS 3	KELAS E CLASS E
	Kegunaan	Pemeliharaan, kawasan dilindungi, Taman Laut	Kehidupan laut, Perikanan, Terumbu Karang, Rekreasi dan Marikultur	Pelabuhan, Lapangan Minyak & Gas	Paya Bakau & Muara Sungai
	Uses	<i>Preservation, marine protected areas, Marine Parks</i>	<i>Marine Life, Fisheries, Coral Reefs, Recreational and Mariculture</i>	<i>Ports, Oil & Gas Fields</i>	<i>Mangroves, Estuarine & River-mouth Water</i>
1	Suhu (°C) Temperature	$\leq 2^\circ\text{C}$ peningkatan terhadap ambien maksimum $\leq 2^\circ\text{C}$ increase over maximum ambient			
2	Oksigen Terlarut (mg/L) Dissolved Oxygen	>80% tepu >80% saturation	5	3	4
3	Jumlah Pepejal Terampai* (mg/L) Total Suspended Solid	25 mg/L atau $\leq 10\%$ peningkatan dalam purata bermusim, yang mana lebih rendah 25 mg/L or $\leq 10\%$ increase in seasonal average, whichever is lower	50 mg/L (25 mg/L) atau $\leq 10\%$ peningkatan dalam purata bermusim, yang mana lebih rendah 50 mg/L (25 mg/L) or $\leq 10\%$ increase in seasonal average, whichever is lower	100 mg/L atau $\leq 10\%$ peningkatan dalam purata bermusim, yang mana lebih rendah 100 mg/L or $\leq 10\%$ increase in seasonal average, whichever is lower	100 mg/L atau $\leq 30\%$ peningkatan dalam purata bermusim, yang mana lebih rendah 100 mg/L or $\leq 30\%$ increase in seasonal average, whichever is lower
4	Minyak dan Geris (mg/L) Oil and Grease	0.01	0.14	5	0.14
5	Raksa* (µg/L) Mercury	0.04	0.16 (0.04)	50	0.5
6	Kadmium* (µg/L) Cadmium	0.5	2 (3)	10	2
7	Kromium (VI) (µg/L) Chromium	5	10	48	10
8	Kuprum (µg/L) Copper	1.3	2.9	10	2.9
9	Arsenik (III)* (µg/L) Arsenic	3	20(3)	50	20(3)
10	Plumbum (µg/L) Lead	4.4	8.5	50	8.5
11	Zink (µg/L) Zinc	15	50	100	50
12	Sianida (µg/L) Cyanide	2	7	20	7
13	Ammonia (tidak terion) (µg/L) Ammonia (unionized)	35	70	320	70
14	Nitrit (NO ₂) (µg/L) Nitrite (NO ₂)	10	55	1,000	55
15	Nitrat (NO ₃) (µg/L) Nitrate (NO ₃)	10	60	1,000	60
16	Fosfat (µg/L) Phosphate	5	75	670	75
17	Fenol (µg/L) Phenol	1	10	100	10
18	Tributyltin (TBT) (µg/L)	0.001	0.01	0.05	0.01
19	Faecal Coliform	70 faecal coliform 100mL ⁻¹	70 faecal coliform 100mL ⁻¹ & (70 faecal coliform 100mL ⁻¹)	200 faecal coliform 100mL ⁻¹	100 faecal coliform 100mL ⁻¹ & (70 faecal coliform 100mL ⁻¹)
20	Polycyclic Aromatic Hydrocarbon (PAHs) µg/L	100	200	1,000	1,000

Sumber: Jabatan Alam Sekitar

Source: Department of Environment

*Nilai Standard dan Kriteria Kualiti Air Marin (SKKAM) dalam kurungan digunakan untuk kawasan air marin yang menjadi sumber makanan laut
Marine Water Quality Criteria and Standard (MWQCS) in parentheses are for coastal and marine water areas where seafood for human consumption is applicable

Status kualiti air sungai mengikut stesen, Sarawak, 2020-2022*Water quality status by stations, Sarawak, 2020-2022*

Negeri State	Lembangan Basin	Sungai River	Nombor stesen Station number	Nilai IKA / WQI value			Kategori IKA/ WQI category (2021)
				2019	2020	2021	
Sarawak	Sg. Balingian	Sg. Balingian	6QBLG001	90	87	84	B/C
		Sg. Balingian	6QBLG002	88	86	89	B/C
	Sg. Baram	Sg. Baram	6QBRM001	79	81	83	B/C
		Sg. Baram	6QBRM002	81	83	83	B/C
		Sg. Baram	6QBRM003	89	89	88	B/C
		Sg. Baram	6QBRM004	90	88	88	B/C
		Sg. Tutuh	6QBRM005	90	-	87	B/C
	Sg. Kayan	Sg. Kayan	6QKYN001	77	76	76	ST/SP
		Sg. Kayan	6QKYN002	82	83	84	B/C
		Sg. Kayan	6QKYN003	87	88	87	B/C
	Sg. Kemena	Sg. Kemena	6QKMN001	82	82	82	B/C
		Sg. Kemena	6QKMN002	89	83	84	B/C
		Sg. Kemena	6QKMN003	81	80	85	ST/SP
		Sg. Kemena	6QKMN004	91	83	84	B/C
		Sg. Sibiu	6QKMN005	81	79	83	ST/SP
	Sg. Kerian	Sg. Kerian	6QKRN014	82	81	86	B/C
		Sg. Kerian	6QKRN015	89	84	88	B/C
		Sg. Seblak	6QKRN016	84	88	87	B/C
		Sg. Selalang	6QKRN017	92	92	90	B/C
	Sg. Lawas	Sg. Lawas	6QLWS001	89	87	90	B/C
		Sg. Lawas	6QLWS002	87	88	91	B/C
		Sg. Lawas	6QLWS003	89	90	92	B/C
	Sg. Limbang	Sg. Limbang	6QLBG001	88	86	88	B/C
		Sg. Limbang	6QLBG002	87	86	88	B/C
		Sg. Limbang	6QLBG003	88	90	89	B/C
		Sg. Limbang	6QLBG004	90	91	88	B/C
		Sg. Limbang	6QLBG005	92	88	90	B/C
	Sg. Lupar	Sg. Ai	6QLPR001	89	91	88	B/C
		Sg. Ai	6QLPR002	91	91	89	B/C
		Sg. Lupar	6QLPR003	77	83	88	B/C
		Sg. Lupar	6QLPR004	82	85	87	B/C
		Sg. Lupar	6QLPR005	89	85	90	B/C
		Sg. Sekerang	6QLPR006	92	88	87	B/C
		Sg. Seterap	6QLPR007	82	86	89	B/C
		Sg. Undup	6QLPR008	91	85	89	B/C

Status kualiti air sungai mengikut stesen, Sarawak, 2020-2022 (samb.)*Water quality status by stations, Sarawak, 2020-2022 (cont'd)*

Negeri State	Lembangan Basin	Sungai River	Nombor stesen Station number	Nilai IKA / WQI value			Kategori IKA/ WQI category (2022)
				2020	2021	2022	
Sarawak	Sg. Miri	Sg. Adong	6QMRI001	83	78	57	T/P
		Sg. Dalam	6QMRI002	84	83	80	ST/SP
		Sg. Lutong	6QMRI003	80	82	83	B/C
		Sg. Lutong	6QMRI004	77	80	74	ST/SP
		Sg. Miri	6QMRI005	87	88	56	T/P
		Sg. Miri	6QMRI006	88	88	60	ST/SP
		Sg. Padang Liku	6QMRI007	89	88	83	B/C
	Sg. Mukah	Sg. Mukah	6QMKH001	85	80	81	B/C
		Sg. Mukah	6QMKH002	89	82	86	B/C
		Sg. Mukah	6QMKH003	89	81	86	B/C
		Sg. Mukah	6QMKH004	89	87	88	B/C
		Sg. Mukah	6QMKH005	89	84	87	B/C
	Sg. Niah	Sg. Niah	6QNIA001	86	87	85	B/C
		Sg. Niah	6QNIA002	86	86	86	B/C
		Sg. Sekaloh	6QNIA003	68	64	79	ST/SP
		Sg. Sekaloh	6QNIA004	87	86	84	B/C
	Sg. Oya	Sg. Oya	6QOYA001	79	76	83	B/C
		Sg. Oya	6QOYA001	89	81	87	B/C
		Sg. Oya	6QOYA001	89	89	86	B/C
	Sg. Rajang	Sg. Baloi	6QRJG019	89	-	89	B/C
		Sg. Binatang	6QRJG004	89	89	87	B/C
		Sg. Daro	6QRJG021	80	62	66	ST/SP
		Sg. Jemoreng	6QRJG022	80	63	66	ST/SP
		Sg. Julau	6QRJG005	88	86	85	B/C
		Sg. Kanowit	6QRJG006	89	87	87	B/C
		Sg. Meradong	6QRJG003	80	82	86	B/C
		Sg. Pakan	6QRJG020	88	89	88	B/C
		Sg. Pila Parit	6QRJG023	62	77	78	ST/SP
		Sg. Rajang	6QRJG008	83	86	86	B/C
		Sg. Rajang	6QRJG009	84	86	87	B/C
		Sg. Rajang	6QRJG010	82	86	85	B/C
		Sg. Rajang	6QRJG011	80	85	87	B/C
		Sg. Rajang	6QRJG012	85	84	89	B/C
		Sg. Rajang	6QRJG013	87	86	87	B/C
		Sg. Rajang	6QRJG014	85	84	86	B/C
		Sg. Rajang	6QRJG015	85	83	84	B/C

Status kualiti air sungai mengikut stesen, Sarawak, 2020-2022 (samb.)*Water quality status by stations, Sarawak, 2020-2022 (cont'd)*

Negeri State	Lembangan Basin	Sungai River	Nombor stesen Station number	Nilai IKA / WQI value			Kategori IKA/ WQI category (2022)
				2020	2021	2022	
Sarawak	Sg. Rajang	Sg. Rajang	6QRJG016	85	86	87	B/C
		Sg. Rajang	6QRJG017	90	86	86	B/C
		Sg. Rajang	6QRJG018	90	84	87	B/C
		Sg. Salim	6QRJG007	83	81	86	B/C
		Sg. Sarikei	6QRJG001	80	86	87	B/C
		Sg. Sarikei	6QRJG002	89	90	88	B/C
	Sg. Sadong	Sg. Karangan	6QSDG001	68	69	76	ST/SP
		Sg. Karangan	6QSDG002	87	87	88	B/C
		Sg. Sadong	6QSDG003	73	81	84	B/C
		Sg. Sadong	6QSDG004	72	66	78	ST/SP
		Sg. Sadong	6QSDG005	88	90	87	B/C
		Sg. Sadong	6QSDG006	90	91	88	B/C
	Sg. Sarawak	Sg. Tarat	6QSDG007	91	90	90	B/C
		Sg. Kelantan	6QSWK017	74	59	68	ST/SP
		Sg. Kuap	6QSWK009	79	88	86	B/C
		Sg. Kuap	6QSWK010	87	88	89	B/C
		Sg. Maong Kiri	6QSWK0 11	72	73	82	B/C
		Sg. Samarahan	6QSWK013	65	63	66	ST/SP
		Sg. Samarahan	6QSWK014	80	85	87	B/C
		Sg. Sarawak	6QSWK001	81	84	84	B/C
		Sg. Sarawak	6QSWK003	83	85	87	B/C
		Sg. Sarawak	6QSWK004	88	87	88	B/C
		Sg. Sarawak	6QSWK006	84	80	84	B/C
		Sg. Sarawak	6QSWK007	90	88	91	B/C
		Sg. Sarawak	6QSWK008	91	89	90	B/C
		Sg. Sarawak Kanan	6QSWK002	82	84	85	B/C
		Sg. Sarawak Kiri	6QSWK005	88	87	87	B/C
		Sg. Semadang	6QSWK016	89	90	90	B/C
		Sg. Semenggoh	6QSWK012	71	78	83	B/C
		Sg. Tabuan	6QSWK015	77	76	78	ST/SP
		Sg. Tapah	6QSWK018	89	91	90	B/C
	Sg. Saribas	Sg. Layar	6QSRB002	85	88	87	B/C
		Sg. Layar	6QSRB003	87	90	88	B/C
		Sg. Saribas	6QSRB001	74	79	87	B/C
	Sg. Semunsam	Sg. Semunsam	6QSMS001	87	80	85	B/C

Status kualiti air sungai mengikut stesen, Sarawak, 2020-2022 (samb.)*Water quality status by stations, Sarawak, 2020-2022 (cont'd)*

Negeri State	Lembangan Basin	Sungai River	Nombor stesen Station number	Nilai IKA / WQI value			Kategori IKA/ WQI category (2021)
				2019	2020	2021	
Sarawak	Sg. Sibuti	Sg. Kabuloh	6QSBT001	76	61	70	ST/SP
		Sg. Kabuloh	6QSBT002	69	64	87	B/C
		Sg. Kejapil	6QSBT003	88	89	85	B/C
		Sg. Satap	6QSBT004	88	84	84	B/C
		Sg. Sibuti	6QSBT005	82	84	77	B/C
		Sg. Sibuti	6QSBT006	87	88	84	ST/SP
	Sg. Similajau	Sg. Similajau	6QSML001	90	86	86	B/C
		Sg. Similajau	6QSML002	89	84	88	B/C
	Sg. Suai	Sg. Suai	6QSUA001	88	87	85	B/C
	Sg. Tatau	Sg. Tatau	6QTTU001	88	85	86	B/C
	Sg. Trusan	Sg. Trusan	6QTSN001	88	88	90	B/C

Nota:*Notes:***B/C: Bersih/ Clean****ST/SP: Sederhana tercemar/ Slightly polluted****T/P: Tercemar/ Polluted****Sumber: Jabatan Alam Sekitar***Source: Department of Environment*

Status kualiti air marin di kawasan pantai, Sarawak, 2020-2022*Marine water quality status for coastal, Sarawak, 2020-2022*

Negeri State	Kawasan Area	Nilai IKAM MWQI Value			Kategori Category (2021)
		2019	2020	2021	
Sarawak	Pantai Sematan	72	93	90	Terbaik/ Excellent
	Pantai Pandan	75	92	86	Baik/Good
	Pantai Pasir Putih	80	84	85	Baik/Good
	Pantai Bako	85	89	91	Terbaik/ Excellent
	Pantai Damai	68	86	89	Baik/Good
	Pantai Tanjung Kembang	86	77	90	Terbaik/ Excellent
	Pantai Harmoni Mukah	60	67	73	Sederhana/ Moderate
	Pantai Tanjung Batu	56	81	74	Sederhana/ Moderate
	Pantai Likau	62	88	66	Sederhana/ Moderate
	Pantai Emas	62	75	66	Sederhana/ Moderate
	Pantai Piasau	70	85	74	Sederhana/ Moderate
	Pantai Brighton	79	75	56	Sederhana/ Moderate
	Pantai Esplaned	70	83	56	Sederhana/ Moderate
	Pantai Beraya	65	83	57	Sederhana/ Moderate
	Pantai Bungai	68	75	66	Sederhana/ Moderate
	Pantai Belawai	66	67	92	Terbaik/ Excellent
	Pantai Mukah	49	89	89	Baik/Good
	Tanjung Kidurong	63	80	90	Terbaik/ Excellent
	Pasir Pandak	74	91	91	Terbaik/ Excellent
	Rambungan	69	93	83	Baik/Good
	Sri Tanjung Lawas	71	68	67	Sederhana/ Moderate
	Pantai Luak	77	84	56	Sederhana/ Moderate
	Pasir Panjang	55	86	78	Sederhana/ Moderate

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Status kualiti air marin di kawasan muara sungai, Sarawak, 2020-2022*Marine water quality status for estuary, Sarawak, 2020-2022*

Negeri State	Kawasan Area	Nilai IKAM MWQI Value			Kategori Category (2021)
		2019	2020	2021	
Sarawak	Kuala Sungai Semantan	65	90	70	Sederhana/ Moderate
	Kuala Sungai Sarawak	64	85	82	Baik/Good
	Kuala Sungai Bako	56	79	88	Baik/Good
	Kuala Sungai Santubong	76	90	90	Terbaik/ Excellent
	Kuala Batang Krian (Kabong)	83	71	87	Baik/Good
	Kuala Batang Rejang	66	85	82	Baik/Good
	Kuala Mukah	50	62	70	Sederhana/ Moderate
	Kuala Batang Kemena	53	58	55	Sederhana/ Moderate
	Kuala Tanjung Similajau	55	85	67	Sederhana/ Moderate
	Kuala Sungai Panipah	55	83	64	Sederhana/ Moderate
	Kuala Pantai Nyalau	58	71	84	Baik/Good
	Kuala Sungai Baram	57	76	55	Sederhana/ Moderate
	Kuala Sungai Miri	68	63	54	Sederhana/ Moderate
	Kuala Sungai Trusan	54	64	56	Sederhana/ Moderate

Sumber: Jabatan Alam Sekitar
Source: Department of Environment

Status kualiti air marin di kawasan pulau, Sarawak, 2020-2022*Marine water quality status for island, Sarawak, 2020-2022*

Negeri State	Kawasan Area	Nilai IKAM MWQI Value			Kategori Category (2021)
		2019	2020	2021	
Sarawak	Satang	76	86	89	Baik/Good
	Talang-Talang Kecil	69	93	86	Baik/Good
	Talang-Talang Besar	79	93	80	Baik/Good

Sumber: Jabatan Alam Sekitar*Source: Department of Environment*

NOTA DAN SIMBOL
NOTES AND SYMBOLS

-	tiada/kosong/tiada kes <i>nil/blank/no cases</i>
..	tidak diperoleh <i>not available</i>
n.a.	tidak berkenaan <i>not applicable</i>
Def.	nilai defektif <i>defective value</i>
0.0	kurang daripada setengah unit terkecil yang ditunjukkan <i>less than half the smallest unit shown</i>
r	pindaan <i>revised</i>
e	anggaran <i>estimate</i>
p	awalan <i>preliminary</i>
i.e.	iaitu <i>that is</i>
PM	Habuk Halus <i>Particulate Matter</i>
CO	Karbon Monoksida <i>Carbon Monoxide</i>
NO ₂	Nitrogen Dioksida <i>Nitrogen Dioxide</i>
O ₃	Ozon <i>Ground Level Ozone</i>
SO ₂	Sulfur Dioksida <i>Sulphur Dioxide</i>
m/s	meter per saat <i>metre per second</i>
hPa	hektopascal <i>hectopascals</i>
MJ/m ²	megajoule per meter persegi <i>megajoule per square metre</i>
µg/m ³	mikrogram setiap meter padu <i>microgram per cubic metre</i>
ppm	bahagian setiap juta <i>parts per million</i>
ppb	bahagian setiap bilion <i>parts per billion</i>
km ²	kilometer persegi <i>square kilometres</i>
mg/l	miligram setiap liter <i>milligram per litres</i>

JKPS <i>MMscf</i>	juta kaki padu standard <i>million standard cubic feet</i>
bil. <i>no.</i>	bilangan <i>number</i>
max.	maksimum <i>maximum</i>
min.	minimum
RM	Ringgit Malaysia
FDES	Rangka Kerja untuk Pembangunan Perangkaan Alam Sekitar <i>Framework for the Development of Environment Statistics</i>
ILP	Institut Latihan Perindustrian <i>Industrial Training Institute</i>
IPD	Ibu Pejabat Polis Daerah
LPG	Gas Asli Cecair <i>Liquefied Petroleum Gas</i>
MPOB	Lembaga Minyak Sawit Malaysia <i>Malaysian Palm Oil Board</i>
PERHILITAN <i>DWNP</i>	Jabatan Perlindungan Hidupan Liar dan Taman Negara <i>Department of Wildlife and National Parks</i>
UNEP	Program Alam Sekitar Bangsa-Bangsa Bersatu <i>United Nations Environment Programme</i>
W.P.	Wilayah Persekutuan

NOTA
NOTE

Pembundaran:	Jumlah bagi komponen mungkin berbeza dengan jumlah besar dalam jadual penerbitan disebabkan oleh pembundaran angka
<i>Rounding:</i>	<i>The sum of components may not add up to the totals in the tables presented in this publication due to rounding</i>

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank



GLOSARI

GLOSSARY

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank

TERMA	PENERANGAN	TERMS	EXPLANATIONS
A			
Air payau	Air yang mengandungi garam yang mana kepekatan garamnya kurang daripada kepekatan garam dalam air laut. Kepekatan jumlah garam yang terlarut biasanya dalam lingkungan 1,000-10,000 miligram per liter (mg/l).	Brackish water	Water containing salts at a concentration significantly lower than that of sea water. The concentration of total dissolved salts is usually in the range of 1,000-10,000 milligrams per litre (mg/l).
Air tawar	Air bersih semula jadi yang mengandungi kurang kepekatan garam. Pada amnya ia sesuai untuk pengeluaran dan dirawat supaya menjadi air bersih yang sesuai untuk minum.	Freshwater	Naturally occurring water has a low concentration of salts. It is generally accepted as suitable for abstraction and treatment to produce potable water.
Aktiviti perlindungan alam sekitar	Tujuan utama adalah pencegahan, pengurangan dan penghapusan pencemaran atau lain-lain bentuk degradasi alam sekitar.	Environmental protection activities	Primary purpose is the prevention, reduction and elimination of pollution and other forms of degradation of the environment.
Ammoniakal Nitrogen (NH₃-N)	Komponen nitrogen yang digunakan sebagai penunjuk untuk menentukan pencemaran oleh kumbahan. Ia terhasil daripada aktiviti mikrobiologi dan biasanya wujud di dalam air permukaan dan air bawah tanah. Sumber utama bagi bahan pencemar NH ₃ -N adalah kumbahan domestik dan ladang ternakan.	Ammoniacal Nitrogen	A component of nitrogen which is adopted as an indicator to determine pollution by sewage. It is formed from microbiology activity and usually exists inside surface water and groundwater. The main sources of NH ₃ -N were domestic sewage and livestock farming.
Akuakultur	Akuakultur ialah proses pengeluaran yang melibatkan pengkulturan (termasuk tuaian) organisma akuatik (ikan, moluska, krustasia, tumbuhan) dengan menggunakan teknik yang direka bentuk untuk meningkatkan pengeluaran organisma tersebut melebihi kapasiti persekitaran semula jadinya.	Aquaculture	Aquaculture refer to the production process involving the culturing or farming (including harvesting) of aquatic organisms (fish, molluscs, crustaceans, plant) using techniques designed to increase the production of the organism beyond the natural capacity of the environment.
Atmosfera	Jisim udara yang mengelilingi bumi yang sebahagian besarnya terdiri daripada oksigen dan nitrogen.	Atmosphere	Mass of air surrounding the earth, composed largely of oxygen and nitrogen.
B			
Bahan pencemar udara	Bahan yang terkandung di dalam udara pada kepekatan yang cukup tinggi, boleh memudaratkan kesihatan manusia, haiwan, tanaman dan harta benda. Pencemar udara adalah termasuk bahan yang hampir kepada bentuk asal atau kandungan tiruan yang wujud terapung di udara. Ia boleh terdiri daripada pepejal, titisan cecair, gas atau gabungan kesemuanya.	Air pollutants	Substances in air that could, at high enough concentrations, harm human beings, animals, vegetation or material. Air pollutants may thus include forms of matter of almost any natural or artificial composition capable of being airborne. They may consist of solid particles, liquid droplets or gases or combination of these forms.

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Bahan pencemar	Bahan yang terdapat dalam kepekatan yang boleh membahayakan organisma (manusia, tumbuhan dan haiwan) atau melebihi standard kualiti alam sekitar. Istilah ini sering digunakan seiring dengan pencemar.	Pollutant	<i>Substance that is present in concentration that may harm organisms (humans, plants and animals) or exceed an environmental quality standard. The term is frequently used synonymously with contaminant.</i>
Banjir	Kuantiti air yang melimpah keluar dari tebing sungai, tasik atau sistem perparitan sedia ada yang disebabkan oleh curahan hujan yang lebat, air laut pasang dan halangan pada sistem saliran.	Flood	<i>A body of water, rising, swelling and overflowing land not usually thus covered. It is also, overflowing of the bank of a stream, lake or drainage system of water onto adjacent land due to storm tidal action and channel obstruction.</i>
Bencana	Bencana merupakan peristiwa luar jangka dan berlaku secara tiba-tiba yang boleh menyebabkan kerosakan, kemusnahan dan penderitaan manusia. Bencana sering digambarkan sebagai kesan daripada pendedahan kepada peristiwa melampau dan boleh dikelaskan sebagai semula jadi dan teknologi bergantung kepada punca.	Disasters	<i>Disasters are unforeseen and often sudden events that cause great damage, destruction and human suffering. A disaster is often described as a result of exposure to and extreme event and can be both natural and technological depending on their cause.</i>
Bencana teknologi	Mungkin disebabkan oleh niat, kecuaiian dan kesilapan manusia, atau daripada aplikasi teknologi yang rosak atau gagal. Tiga jenis bencana teknologi: kemalangan industri, kemalangan pengangkutan dan pelbagai kemalangan.	Technological disasters	<i>May arise as a result of human intent, negligence or error, or from faulty or failed technological applications. Three types of technological disasters: industrial accidents, transport accidents and miscellaneous accidents.</i>
Buangan terjadual	Merupakan buangan toksik dan berbahaya yang dihasilkan oleh industri, pertanian, bengkel, kontraktor buangan terjadual, aktiviti domestik dan buangan klinikal dari hospital. Kategori sisa adalah yang tersenarai dalam Jadual Pertama Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005.	Scheduled waste	<i>Defined as toxic waste and hazardous generated by industries, agriculture, workshop, scheduled waste contractors, domestic activities and clinical wastes from hospitals. The waste category listed in the First Schedule Environmental Quality Regulation (Scheduled Waste) 2005.</i>
D			
Rangka Kerja Driving Force-Pressure-State-Impact-Response (DPSIR)	Rangka analitikal yang berdasarkan hubungan di antara komponen D-P-S-I-R.	Driving Force-Pressure-State-Impact-Response (DPSIR) framework	<i>An analytical framework that is based on the casual relationship between its D-P-S-I-R components.</i>
Demam denggi	Penyakit jangkitan virus yang merebak melalui gigitan nyamuk Aedes aegypti yang telah dijangkiti.	Dengue fever	<i>A type of viral infection that spreads through infected Aedes aegypti mosquito bites.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Disentri	Disentri adalah cirit-birit akut yang mengandungi darah di dalam najis. Disentri kebanyakannya disebabkan oleh spesies <i>Shigella</i> (<i>disentri bacillary</i>) atau <i>Entamoeba histolytica</i> (<i>disentri amoebic</i>).	Dysentery	<i>Dysentery is acute diarrhoea with visible blood in the stool. Dysentery is most often caused by Shigella species (bacillary dysentery) or Entamoeba histolytica (amoebic dysentery).</i>
F			
Fauna	Semua kehidupan haiwan.	Fauna	<i>All animal life.</i>
Flora	Semua kehidupan tumbuhan.	Flora	<i>All plant life.</i>
H			
Habuk Halus (PM)	Partikel pepejal atau titisan cecair dalam udara atau pelepasan yang saiznya 0.01-100µm, contohnya habuk, asap, wasap, semburan dan kabut.	Particulate Matter (PM)	<i>Solid particles or liquid droplets in the air or emission 0.01-100µm size, eg: dust, smoke, fume, spray and mist.</i>
Habuk Halus (PM₁₀)	Partikel terampai berukuran kurang daripada diameter 10 mikron. PM ₁₀ boleh berbentuk pepejal atau cecair dan ia termasuk aerosol, debu, asap dan debunga. Partikel ini berpunca daripada stesen janakuasa, proses industri dan aktiviti pembakaran terbuka.	Particulate Matter (PM₁₀)	<i>Respirable particles of less than 10 micron in diameter. PM₁₀ can be in solid or liquid form and it includes aerosol, dust, smoke and pollen. These particles originate from power plants, industrial processes and open burning activities.</i>
Halaju angin	Suatu kuantiti vektor di mana ia mempunyai magnitud dan arah. Magnitud halaju angin dipanggil laju angin manakala arah angin merujuk dari mana angin bertiup.	Wind velocity	<i>A quantity of vectors in which it has magnitude and direction. The magnitude of the wind velocity is called the wind speed while the wind direction refers to where the wind blows.</i>
Hakisan	Proses penghausan permukaan fizikal. Biasanya dikaitkan dengan kehilangan tanah disebabkan air, salji atau angin. Hakisan berlaku secara semula jadi dan menyebabkan bertambah buruk akibat pembersihan tanah yang berkaitan dengan aktiviti manusia seperti pertanian, perumahan atau perindustrian.	Erosion	<i>Wearing away and transport of the soil by wind or running water, glaciers or waves. Erosion occurs naturally but is often intensified by human land-clearing activities related to farming, residential or industrial development.</i>
Hutan	Tanah merangkumi lebih daripada 0.5 hektar dengan ketinggian pokok lebih daripada 5 meter dan penutup kanopi lebih daripada 10 peratus, atau pokok yang dapat mencapai ambang in situ. Ia tidak termasuk tanah yang didominasi oleh penggunaan tanah pertanian atau bandar.	Forest	<i>Land spanning more than 0.5 hectares with tree higher than 5 metres and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Hutan bandar	Menanam, memelihara dan mengurus pokok di kawasan awam seperti taman rekreasi, taman permainan dan kawasan lapang termasuk sepanjang lebuh raya.	Urban forest	<i>Planting, protecting and managing trees in public areas such as recreational parks, playgrounds and open spaces includes the route along the highway.</i>
Hutan Simpanan Kekal (HSK)	Mana-mana tanah (tanah berhutan dan tidak berhutan) yang diwartakan atau disifatkan sebagai HSK untuk tujuan perhutanan di bawah Seksyen 7, 8 dan 9, Akta Perhutanan Negara.	Permanent Reserved Forest (PRF)	<i>Any land (forested and non-forested land) that has been enacted or deemed PRF for forestry purposes under Sections 7, 8 and 9, the National Forestry Act.</i>

I

Indeks Kualiti Air	Purata pemberat bagi kepekatan ambien bahan pencemar terpilih biasanya berkait kepada pengelasan kualiti air.	Water Quality Index	<i>Weighted average of selected ambient concentrations of pollutants usually linked to water quality classes.</i>
Indeks Pencemaran Udara (IPU)	Satu indikator yang dicipta berdasarkan kepada penilaian saintifik bagi memaklumkan dengan cara yang mudah difahami kehadiran pencemaran udara dan impaknya terhadap kesihatan manusia. Nilai IPU dikira berdasarkan kepekatan purata setiap pencemar udara iaitu SO ₂ , NO ₂ , CO, O ₃ dan PM ₁₀ . Pencemar udara yang dominan dengan kepekatan tertinggi diambil kira sebagai pencemar yang akan menentukan nilai IPU. Pada lazimnya, kepekatan PM ₁₀ adalah yang tertinggi berbanding dengan pencemar yang lain dan ini menentukan bacaan IPU.	Air Pollutant Index (API)	<i>An indicator which is created based on scientific assessment to provide user friendly information about the presence of air pollution and its impact on human health. API value is calculated based on the average concentration of each air pollutant SO₂, NO₂, CO, O₃ and PM₁₀. Dominant of air pollutant with the highest concentrations of pollutants are accounted for as that will determine the value of the API. In general, concentrations of PM₁₀ are the highest compared to other concentrations and this determines the API readings.</i>
Indeks UV Suria (UVI)	Menerangkan tentang sinaran UV di permukaan Bumi. Nilai indeks tersebut mempunyai julat dari sifar ke atas – semakin tinggi nilai indeks, semakin besar potensi berlaku kerosakan pada kulit dan mata, semakin cepat kesan tersebut boleh berlaku.	Solar UV Index (UVI)	<i>Describes the UV rays on the Earth's surface. The value of the index has a range from zero upwards - the higher the value of the index, the greater the potential for damage to the skin and eyes and the faster the effect can occur.</i>
Insinerator	Relau untuk membakar bahan buangan di bawah keadaan terkawal.	Incinerator	<i>Furnace for burning wastes under controlled conditions.</i>

K

Kadar mortaliti bayi	Nisbah bilangan kematian bayi di bawah umur 1 tahun dalam sesuatu tahun kepada jumlah bilangan kelahiran hidup dalam tahun itu (bagi setiap seribu kelahiran hidup).	Infant mortality rate	<i>The ratio number of deaths of infants under 1 year of age in a given year to the total number of live births in that year (per thousand live births).</i>
-----------------------------	--	------------------------------	--

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Kawasan tadahan	Kawasan di mana hujan mengalir ke dalam sungai, tasik atau takungan.	Catchment area	<i>The area from which rainfall flows into a river, lake or reservoir.</i>
Kapasiti pengeluaran	Keupayaan pengeluaran air bagi loji yang beroperasi sepenuhnya dalam tahun berkenaan. Kapasiti pengeluaran berbeza setiap tahun tertakluk kepada reka bentuk loji.	Production capacity	<i>The ability to produce water by fully operated plants in the respective year. The production capacity varies every year according to the design of the plants.</i>
Karbon Monoksida	Tidak berwarna, tidak berbau dan gas beracun yang dihasilkan oleh pembakaran bahan api dan fosil yang tidak lengkap.	Carbon Monoxide	<i>Colourless, odourless and poisonous gas produced by incomplete fossil fuel combustion.</i>
Kawasan bandar	Kawasan yang diwartakan serta kawasan tepubina yang bersempadan dengannya dan gabungan kedua-dua kawasan ini mempunyai penduduk seramai 10,000 atau lebih. Kawasan tepubina didefinisikan sebagai kawasan yang terletak bersebelahan kawasan yang diwartakan dan mempunyai sekurang-kurangnya 60 peratus (berumur 15 tahun dan lebih) yang terlibat dalam aktiviti bukan pertanian.	Urban area	<i>Gazetted areas with their adjoining built-up areas which had a combined population of 10,000 or more. Built-up areas were defined as more. Built-up areas were defined as areas contiguous to a gazetted area and had at least 60 per cent of their population (aged 15 years and over) engaged in non-agricultural activities.</i>
Kawasan perlindungan/ simpanan	Kawasan tanah dan/ atau laut khususnya bagi perlindungan dan pemuliharaan kepelbagaian biologi, yang berkaitan dengan sumber semula jadi dan diurus melalui perundangan ataupun cara lain yang berkesan. Definisi ini diadaptasi daripada <i>The International Union for Conservation of Nature</i> (IUCN).	Protected/preserved area	<i>An area of land and/ or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources and managed through legal or other effective means. This definition is adopted by The International Union for Conservation of Nature (IUCN).</i>
Kemalangan jalan raya	Kemalangan atau kejadian yang mana kerosakan berlaku ke atas mana-mana orang, harta, kenderaan, struktur atau haiwan dan berlaku di mana-mana jalan awam termasuklah jambatan, terowong, hentian sebelah, jalan bertingkat, jejambat, plaza tol dan sebagainya.	Road traffic crash	<i>Accidents or occurrences whereby damage or injury is caused to any person, property, vehicle, structure or animal and occurs in any public road including bridge, tunnels, lay-bye, interchanges, overpasses, toll plazas and so on.</i>
Kelajuan angin permukaan	Merujuk kepada laju angin pada ketinggian piawai 10m di atas tanah.	Surface wind speed	<i>Refers to the wind speed at a standard altitude of 10m above ground.</i>
Kepadatan penduduk	Jumlah bilangan penduduk setiap unit per segi di kawasan muka bumi.	Population density	<i>Total number of inhabitants per square unit of surface area.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Kepelbagaian biologi	Kepelbagaian biologi bermaksud variasi di antara organisma hidup daripada pelbagai sumber termasuk daratan, marin serta ekosistem akuatik lain; ia termasuklah kepelbagaian di dalam peringkat genetik, spesies dan ekosistem. Definisi ini diadaptasi daripada <i>United Nations Convention on Biological Diversity</i> .	<i>Biological diversity</i>	<i>Biological diversity means the variability among living organisms from various sources including terrestrial, marine and other aquatic ecosystems; this includes diversity at the genetic, species and ecosystem level. This definition is adopted by the United Nations Convention on Biological Diversity.</i>
Keperluan Oksigen Biokimia (BOD₅)	Ukuran jumlah oksigen terlarut yang diperlukan oleh organisma untuk mengurai bahan organik yang terdapat di dalam air. Biasanya bacaan diambil dalam tempoh 5 hari.	<i>Biochemical Oxygen Demand (BOD₅)</i>	<i>Dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water. This measurement is usually taken within 5 days.</i>
Keperluan Oksigen Kimia (COD)	Indeks pencemaran air yang digunakan sebagai ukuran kepekatan jisim oksigen yang diperlukan untuk mengurai bahan organik dan bukan organik.	<i>Chemical Oxygen Demand (COD)</i>	<i>Index of water pollution measuring the mass concentration of oxygen consumed by the chemical breakdown of organic and inorganic matter.</i>
Kolera	Penyakit usus pada umumnya disebabkan oleh pencemaran najis daripada air dan makanan.	<i>Cholera</i>	<i>Intestinal disease generally caused by faecal contamination of water and food.</i>
Kuasa hidro	Tenaga primer yang disimpulkan tersedia untuk pengeluaran elektrik dan ditunjukkan dari segi konvensional setara dengan bahan api fosil menggunakan kecekapan purata penukaran haba untuk tahun tersebut.	<i>Hydropower</i>	<i>Is the inferred primary energy available for electricity production and is shown in terms of conventional fossil fuel equivalent using the average thermal efficiency of conversion for the year.</i>
Kutipan biji benih	Biji benih pokok hutan yang dikutip secara terus dari atas pokok.	<i>Seeds collections</i>	<i>Seeds of forest trees collected directly from the tree.</i>
L			
Ladang hutan	Kawasan yang ditanam dengan pokok atau tumbuh-tumbuhan hutan, sama ada daripada spesies tempatan atau dagang, dengan kaedah tanaman secara terbuka yang luasnya tidak kurang daripada 50 ha. Ladang hutan boleh merangkumi kawasan yang terletak di dalam atau di luar HSK.	<i>Forest plantation</i>	<i>Area planted with trees or forest plants, whether from local or foreign species, the method of cultivation as wide open no less than 50 ha. Forest plantations can include areas that are located within or outside the PRF.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Latar belakang	Stesen yang tidak terpengaruh dengan faktor-faktor pencemaran udara dari industri dan kenderaan bermotor. Stesen ini biasanya ditempatkan di kawasan yang jauh dari punca pencemar dan dijadikan bacaan rujukan bagi kategori stesen yang lain.	Background	<i>Stations that is not affected by air pollution factors from industry and motor vehicles. The station is usually located in a remote area of interest and is a reference point for other categories of stations.</i>
Logam berat	Logam bertoksik yang digunakan dalam proses industri, sebagai contoh, arsenik, kadmium, kromium, tembaga, plumbum, raksa, nikel dan zink. Ia boleh merosakkan kehidupan tumbuhan dan haiwan pada kepekatan yang rendah dan cenderung untuk berkumpul dalam rantaian makanan.	Heavy metals	<i>Potentially toxic metals used in industrial processes, for example, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc. They may damage plant and animal life at low concentrations and tend to accumulate in the food chain.</i>
M			
Megakepelbagaian	Konsep megakepelbagaian melibatkan anggaran jumlah bilangan semua organisma hidup di dalam ekosistem dan ini bermakna sesuatu kawasan itu mempunyai sekurang-kurangnya 60.0 peratus daripada spesis yang diketahui di dunia. Sebahagian besar daripada kepelbagaian tersebut adalah endemisme dan ini menggambarkan keunikan kawasan tersebut.	Megadiversity	<i>The concept of megadiversity involves an estimate of the total number of all the organisms in an ecosystem and is represented by an area that comprises at least 60.0 per cent of the world's known species. A major part of diversity is endemism as this reflects the uniqueness of an area.</i>
N			
Nilai defektif	Nilai yang diragui atau nilai yang tidak diterima setelah menjalani proses semakan kualiti data.	Defective value	<i>A doubtful value or an unacceptable value after undergoing a data quality review process.</i>
Nilai pH	Ukuran kepada keasidan untuk nilai alkali dalam cecair. Nilai pH di antara lingkungan 0 ke 7 menunjukkan asid, nilai pH di antara lingkungan 7 ke 14 menunjukkan alkali dan nilai pH 7 menandakan neutral.	pH Value	<i>Measure of the acidity or alkalinity of a liquid. A pH value in the range of 0 to 7 indicates acidity, a pH value in the range of 7 to 14 indicates alkalinity and a pH value of 7 signifies neutrality.</i>
Nitrogen Dioksida (NO₂)	Nitrogen Dioksida terbentuk di persekitaran udara melalui pengoksidaan Nitrogen Monoksida (NO). Gas bertoksik berwarna merah keperangan ini mempunyai bau yang kuat dan tajam.	Nitrogen Dioxide (NO₂)	<i>Nitrogen Dioxide is formed in the ambient air through the oxidation of Nitrogen Monoxide (NO). This reddish brown toxic gas has a sharp and pungent odour.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
O			
Oksigen Terlarut (DO)	Jumlah gas oksigen (O ₂) yang berada dalam air, dikira mengikut kandungannya dalam isi padu air (miligram O ₂ seliter) atau jumlah peratusnya dalam air tepu.	<i>Dissolved Oxygen (DO)</i>	<i>Amount of gaseous oxygen (O₂) actually present in water expressed in terms either of its presence in the volume of water (milligrams of O₂ per litre) or of its share in saturated water (percentage).</i>
Ozon (O₃)	Gas yang mengeluarkan bau yang tidak menyenangkan, tidak berwarna dan bertoksik yang menyumbang kepada fotokimia asbut (campuran asap dan kabut). O ₃ terbentuk hasil daripada reaksi kimia antara Sebatian Organik Meruap (VOC) dan Nitrogen Oksida (NO _x). Pada lewat tengah hari atau awal petang, lazimnya kepekatan ozon adalah tinggi dan mendominasi bacaan IPU di sesetengah kawasan. Di bawah pengaruh cahaya matahari, NO _x dan VOC yang dilepaskan dari ekzos kenderaan bermotor dan industri ia bertindak balas bagi membentuk ozon di permukaan bumi.	<i>Ground Level Ozone (O₃)</i>	<i>A pungent, colourless and toxic gas that contributes to photochemical smog. O₃ is formed as a result of chemical reaction in the air between Volatile Organic Compounds (VOCs) and Nitrogen Oxide (NO_x). By the late afternoon or early evening, usually O₃ concentration is high and dominating API readings in some areas. Under the sunlight influence, and reaction between NO_x and VOC that released from motor vehicles exhaust and industrial which form the O₃ in the earth's surface. Under the influence of sunlight, nitrogen oxide (NO_x) and volatile organic compounds (VOCs) emitted from motor vehicle exhaust and industry reacts to form O₃ in the earth's surface.</i>
P			
Pelepasan	Pembuangan bahan pencemar ke atmosfera dari punca tetap seperti cerobong asap dan lain-lain, kawasan komersial atau perindustrian dan juga berpunca daripada punca bergerak seperti kenderaan bermotor, lokomotif dan pesawat.	<i>Emission</i>	<i>Discharge of pollutants into the atmosphere from stationary sources such as smokestacks, other vents, surface areas of commercial or industrial facilities and mobile sources, for example, motor vehicles, locomotives and aircraft.</i>
Pemantauan kualiti udara	Bacaan <i>standard</i> dan pemerhatian terhadap udara yang diambil secara berterusan atau kerap yang digunakan sebagai peringatan dan kawalan.	<i>Air quality monitoring</i>	<i>Continuous or frequent standardised measurement and observation of the air, often used for warning and control.</i>
Pencemaran marin	Pengenalan langsung atau tidak langsung oleh manusia atau tenaga ke dalam alam sekitar marin (termasuk muara), menghasilkan kemusnahan kepada sumber kehidupan, berbahaya kepada kesihatan hidupan, halangan kepada kegiatan marin termasuk memancing, merosakkan kualiti air laut dan mengurangkan keselesaan.	<i>Marine pollution</i>	<i>Direct or indirect introduction by humans of substances or energy into the marine environment (including estuaries), resulting in harm to living resources, hazards to human health, hindrances to marine activities including fishing, impairment of the quality of sea water and reduction of amenities.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Pencemaran marin	Pengenalan langsung atau tidak langsung oleh manusia atau tenaga ke dalam alam sekitar marin (termasuk muara), menghasilkan kemusnahan kepada sumber kehidupan, berbahaya kepada kesihatan hidupan, halangan kepada kegiatan marin termasuk memancing, merosakkan kualiti air laut dan mengurangkan keselesaan.	Marine pollution	<i>Direct or indirect introduction by humans of substances or energy into the marine environment (including estuaries), resulting in harm to living resources, hazards to human health, hindrances to marine activities including fishing, impairment of the quality of sea water and reduction of amenities.</i>
Pencemaran udara	Kandungan sesuatu gas, cecair atau zarah yang terampai di udara ambien yang boleh menjejaskan kehidupan atau memberi kesan negatif kepada manusia, tumbuh-tumbuhan dan haiwan.	Air pollution	<i>Content of a gas, liquid or particles suspended in the ambient air that could affect life or a negative impact on humans, plants and animals.</i>
Penempatan penduduk	Konsep penyatuan yang terdiri daripada (a) komponen fizikal tempat berteduh dan infrastruktur dan (b) perkhidmatan yang mana menyokong penyediaan elemen fizikal. Ini boleh dikatakan seperti perkhidmatan komuniti seperti pendidikan, kesihatan, kebudayaan, kebajikan, rekreasi dan pemakanan.	Human settlements	<i>Integrative concept that comprises (a) physical components of shelter and infrastructure and (b) services to which the physical elements provide support, that is to say, community services such as education, health, culture, welfare, recreation and nutrition.</i>
Pengawasan kualiti air	Bacaan <i>standard</i> dan pemerhatian terhadap air yang diambil secara berterusan atau kerap yang digunakan sebagai peringatan dan kawalan.	Water quality monitoring	<i>Continuous or frequent standardised measurement and observation of the water often used for warning and control.</i>
Penyejatan	Suatu proses yang melibatkan perubahan fasa cecair kepada gas apabila cecair terdedah kepada atmosfera. Dalam meteorologi ia diukur sebagai jumlah sejatan iaitu jumlah air yang disejat daripada tangki sejatan.	Evaporation	<i>A process that involves the phase change of a liquid to a gas when the liquid is exposed to the atmosphere. In meteorology, it is measured as the amount of evaporation i.e. the amount of water evaporated from the evaporation tank.</i>
Penyiasatan migrasi	Mengumpul maklumat responden di tempat kediaman pada dua titik masa (tarikh tertentu), di mana tempoh antaranya genap satu tahun. Pertukaran lokaliti tempat kediaman pada dua titik masa ini dianggap sebagai migrasi. Penduduk yang bertukar lokaliti tempat kediaman serta selalu merentasi sempadan negeri adalah migran antara negeri.	Migration survey	<i>Collects information on respondents' usual place of residence at two specific points of time (different date) which are exactly one year apart. Changes in the usual place of residence locality at these two points in time constitute migration. Population that changes its usual place of residence across state boundaries is known as inter-state migrant.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Pepejal Terampai (SS)	Pepejal Terampai (SS) berpunca daripada hakisan tanah dan mendapan daripada pembangunan kawasan tanah tinggi dan pembukaan tanah untuk pembalakan dan perlombongan. Ia akan mengakibatkan peningkatan SS dan perubahan kepada kualiti air di dalam lembangan sungai.	<i>Suspended Solids</i>	<i>Suspended Solids (SS) is caused by soil erosion and sedimentation from the development in highlands and clearance of land for logging and mining. It is resulted in the increase of SS and affects water quality in the river basins.</i>
Perangkaan alam sekitar	Statistik yang menerangkan keadaan dan arah aliran alam sekitar, meliputi media alam sekitar semula jadi (udara/iklim, air, tanah), biota dalam media dan penempatan penduduk. Perangkaan alam sekitar mengukur aktiviti manusia dan kejadian semula jadi yang membawa kesan kepada alam sekitar, kesan daripada aktiviti-aktiviti dan kejadian ini, reaksi masyarakat kepada kesan alam sekitar dan kualiti kesediaan aset semula jadi. Definisi luas termasuk petunjuk alam sekitar, indeks dan perakaunan.	<i>Environment statistics</i>	<i>Statistics that describe the state and trends of the environment, covering the media of the natural environment (air/climate, water, land/soil), the biota within the media, and human settlements. Environment statistics are integrative in nature, measuring human activities and natural events that affect the environment, the impacts of these activities and events, social responses to the environmental impacts, and the quality and availability of natural assets. Broad definitions include environmental indicators, indices and accounting.</i>
Perubahan iklim	Istilah yang kerap digunakan merujuk kepada kepanasan sejagat berkaitan pelepasan gas rumah kaca hasil kegiatan manusia.	<i>Climate change</i>	<i>Term frequently used in reference to global warming due to greenhouse gas emissions from human activities.</i>
R			
Rangka Kerja Pembangunan Perangkaan Alam Sekitar	Konsep rangka kerja bagi membantu membangunkan, menyelaraskan dan menguruskan perangkaan alam sekitar dan perangkaan berkaitan dengan sosial ekonomi dan demografi. Ia dibangunkan oleh <i>United Nations Statistics Division</i> dalam tahun 1984 dan ianya berdasarkan kepada prinsip tekanan-tindak balas impak alam sekitar.	<i>Framework for the Development of Environment Statistics (FDES)</i>	<i>Conceptual framework that assists in development, coordination and organisation of environment statistics and related socio-economic and demographic statistics. It was developed by the United Nations Statistics Division in 1984 and is based on stress-response principles of environmental impacts.</i>
S			
Sinaran global	Jumlah sinaran radiasi elektromagnet yang dipancarkan oleh matahari ke permukaan bumi.	<i>Global radiation</i>	<i>The amount of electromagnetic radiation emitted by the sun to the earth's surface.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Sisa	Aliran bahan pepejal, cecair dan gas, serta tenaga, yang dibuang, dilepaskan atau dikeluarkan oleh pertubuhan dan isi rumah melalui proses pengeluaran, penggunaan atau pengumpulan.	Residuals	<i>Flows of solid, liquid and gaseous materials, and energy, discarded, discharged or emitted by establishments and households through production, consumption or accumulation processes.</i>
Sistem bekas lombong	Sistem untuk menternak ikan di mana-mana tanah yang pernah (tetapi tidak lagi) diberi atau dikeluarkan pajakan lombong atau sijil lombong di bawah mana-mana undang-undang bertulis mengenai perlombongan.	Ex-mining culture system	<i>System of fish culture on any land in respect of which a mining lease or certificate (were once but no longer) granted or issued under any written law relating to mining.</i>
Sistem kandang	Sistem yang merupakan suatu kepungan yang dibuat daripada bahan pengadang yang dilekatkan pada tiang yang ditanam ke dasar laut.	Pen culture system	<i>System of fish culture in an enclosure made of any screening material attached to poles staked to the seabed.</i>
Sistem kolam	Sistem ternakan ikan di dalam kolam.	Culture system	<i>System of fish culture in ponds.</i>
Sistem sangkar	Sistem untuk menternak ikan di dalam suatu kepungan yang dibuat daripada apa-apa bahan saringan yang diikat pada struktur yang dilabuhkan pada dasar perairan sungai atau mana-mana tempat di darat.	Cage culture system	<i>System of fish culture in an enclosure on whatever shape or size made of any screening material and attached to floating structures which are anchored to the sea-bed.</i>
Sistem tangki	Sistem ternakan ikan di dalam tangki di atas tanah.	Tank culture system	<i>System of fish culture in tanks on land.</i>
Standard kualiti udara	Kepekatan sesuatu bahan cemar yang dibenarkan dalam atmosfera oleh undang-undang untuk meminimumkan kesan mudarat.	Air quality standards	<i>Levels of air pollutants prescribed by regulations that may not be exceeded during a specified time in a defined area.</i>
Subbandar	Stesen pengawasan kualiti udara yang terletak di kawasan pinggir bandar.	Suburban	<i>Air quality monitoring stations located in the suburban areas.</i>
Sulfur Dioksida (SO₂)	Berat, tajam, gas tidak berwarna terbentuk terutamanya oleh pembakaran bahan api fosil. Ia adalah berbahaya kepada manusia dan tumbuh-tumbuhan dan menyumbang kepada keasidan dalam hujan.	Sulphur Dioxide (SO₂)	<i>Heavy, pungent, colourless gas formed primarily by the combustion of fossil fuels. It is harmful to human beings and vegetation and contributes to the acidity in precipitation.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
T			
Taman Laut	Kawasan perairan laut yang dizonkan sejauh dua batu nautika dari tikas air surut terendah, kecuali Pulau Kapas di Terengganu, Pulau Kuraman, Pulau Rusukan Besar dan Pulau Rusukan Kecil di W.P. Labuan yang dizonkan sejauh satu batu nautika dari tikas air surut terendah. Taman Laut ditubuhkan untuk melindungi dan memulihara pelbagai habitat dan hidupan marin akuatik.	Marine Park	<i>Sea zoned area for a distance of two nautical miles from the lowest sea level, except in Kapas Island in Terengganu, Kuraman Island, Rusukan Besar Island and Rusukan Kecil Island in W.P. Labuan. These areas are zoned for a distance of one nautical mile from the lowest sea level. Marine Park is established to protect and conserve various habitats and aquatic marine life.</i>
Tanah Bencah-Ramsar	Kawasan yang berpayau, fen, tanah gambut atau berair samada semula jadi atau buatan manusia, kekal atau sementara, mengandungi air yang tidak mengalir, mengalir, air bersih, air tawar atau masin termasuk kawasan perairan laut, di mana dalamannya tidak melebihi enam meter.	Wetland-Ramsar	<i>Areas of marshes, fen, peatland or water, whether natural or artificial, permanent or temporary, static water, flowing, fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six metres.</i>
Tanah bencah	Kawasan dari lapisan tanah rendah yang mana aras air bumi yang berada atau berhampiran dengan permukaan tanah pada kebanyakan masa. Tanah bencah termasuk semua tanah berpayau, tanah berlumpur, fen dan muara.	Wetland	<i>Area of low-lying land where the water table is at or near the surface most of the time. Wetlands include swamps, bogs, fens, marshes and estuaries.</i>
Tanah berhutan	Tanah yang merangkumi lebih daripada 0.5 hektar. Pokok-pokok mencapai tinggi sekurang-kurangnya lima meter dengan litupan kanopi melebihi 10 peratus, atau pokok yang mampu untuk mencapai tahap in-situ (FAO 1998; FRA 2000). Ia tidak termasuk tanah di bawah penggunaan tanah pertanian atau bandar (dirian pokok di kawasan pertanian, taman dan sebagainya). Keluasan kawasan berhutan ini dibahagikan kepada Hutan Simpanan Kekal (HSK), Hutan Tanah Kerajaan (HTK), Hutan Hidupan Liar di luar kawasan HSK, lain-lain Rizab Berhutan dan Tanah Bermilik.	Forested land	<i>A land area of more than 0.5 hectares. The trees should be able to reach a minimum height of five metres with a tree canopy cover of more than 10 per cent, or the trees that are capable to reach in-situ level (FAO 1998; FRA 2000). It does not include land under agricultural or urban land use (stand of trees in agricultural areas, parks, etc.). Forested land is divided into permanent forest reserve (PRF), forest land government (FLG), forest wildlife outside the (PRF), others forested reserve and alienated land. (FAO 1998; FRA 2000)</i>
Tanaman	Tanaman merujuk kepada tumbuhan atau hasil pertanian yang ditanam untuk makanan atau keperluan ekonomi lain seperti pakaian atau makanan ternakan.	Crops	<i>Crops refer to plants or agricultural produce grown for food or other economic purposes, such as clothes or livestock fodder.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Tanaman buluh	Buluh digunakan secara meluas dalam industri pembuatan perabot, kraftangan, bekas barangan, tikar, pulpa, kertas, bahan bakar, pembinaan dan peralatan rumah.	Bamboo plantation	<i>Bamboo is a widely used in the furniture manufacturing industry, handicrafts, container products, matting, pulp, paper, fuel, and construction as well as home appliances.</i>
Tanaman mengaya	Merupakan suatu rawatan pemulihan hutan ke atas kawasan hutan miskin dan kawasan lapang yang dilaksanakan ke atas kawasan di dalam HSK yang telah diusahailah bagi membantu meningkatkan isi kandungan hutan tersebut supaya mencapai tahap yang dikehendaki.	Enrichment planting	<i>Forest restoration treatments on poor forest areas and open spaces that are performed on the areas in PRF which has been harvested to help improve the content of the forest to reach the desired level.</i>
Tanaman rotan	Salah satu hasil hutan bukan kayu utama. Bertujuan untuk meningkatkan stok tumbuhan dalam kawasan HSK yang sesuai bagi memastikan pengeluaran sumber ini secara berkekalan untuk menampung keperluan industri perabot rotan tempatan.	Rattan plantation	<i>One of the main non-timber forest products. The plantation is to increase the stock of this plant in the PRF appropriate to ensure sustainable production of these resources to meet the needs of the local rattan furniture industry.</i>
Tanaman tumbuhan ubatan	Spesies tumbuhan yang mempunyai nilai perubatan dan ditanam secara ladang.	Planting of medicinal plants	<i>Species of plants that have medicinal value and cultivated fields.</i>
Tapak pelupusan	Pemindahan terakhir bahan sisa di dalam atau di atas tanah yang dikawal atau tidak dikawal mengikut cara kebersihan yang berbeza, perlindungan alam sekitar dan keperluan keselamatan yang lain.	Landfill	<i>Final replacement of waste in or on the land in a controlled or uncontrolled way according to different sanitary, environmental protection and other safety requirements.</i>
Tapak pelupusan sanitari	Kaedah untuk melupuskan sisa pepejal di atas tanah tanpa menimbulkan gangguan atau bahaya kepada kesihatan awam dan alam sekitar. Berdasarkan prinsip kejuruteraan, sisa pepejal dihadkan kepada kawasan kecil, dikurangkan kepada jumlah yang ter kecil dan ditutup dengan lapisan tanah pada penghujung waktu operasi (ditutup setiap hari), atau pada jangka masa yang lebih kerap mengikut keperluan.	Sanitary landfill	<i>A method of disposing of solid wastes on land without creating nuisances or hazards to public health or the environment. Using the principles of engineering, the solid waste is confined to the smallest practical area, reduced to the smallest practical volume and covered with a layer of earth at the conclusion of operation (daily cover), or at more frequent intervals as may be necessary.</i>
Tapak semaian	Menghasilkan anak benih dan anak pokok untuk digunakan bagi projek-projek penghutan semula, penyelidikan, perhutanan bandar dan aktiviti landskap.	Nursery	<i>Produce seedlings and saplings to be used for reforestation projects, research, urban forestry and landscape activities.</i>

TERMA	PENERANGAN	TERMS	EXPLANATIONS
Tekanan aras laut	Tekanan udara yang diukur berdasarkan jarak ketinggian dari paras purata aras laut (mengikut ICAO Standard Atmosphere).	Sea level pressure	<i>The air pressure measured based on the altitude distance from the mean sea level (according to the ICAO Standard Atmosphere).</i>
Tidak diperoleh	Tiada pencerapan dilaksanakan.	Not available	<i>No observations are performed</i>
Topografi	Bentuk fizikal kawasan permukaan, termasuk muka bumi atau ketinggian relatif dan kedudukan bentuk muka bumi buatan manusia dan semula jadi.	Topography	<i>Physical feature of a surface area, including its relief or relative elevations, and the position of human-made and natural features.</i>
V			
Viral Hepatitis A	Penyakit akut biasanya termasuk demam, dedar, keletihan melampau, anoreksia, loya, jaundis akut dan kuadran atas kanan abdomen dengan pertambahan lebihan alanine aminotransferase melebihi 2.5 kali kadar biasa.	Viral Hepatitis A	<i>Acute illness typically including fever, malaise, extreme fatigue, anorexia, nausea, acute jaundice and right upper quadrant of abdomen tenderness with raised alanine aminotransferase more than 2.5 times normal rate.</i>

PENERBITAN INI BOLEH JUGA DIPEROLEH DI JABATAN PERANGKAAAN NEGERI SEPERTI BERIKUT:

THIS PUBLICATION IS ALSO AVAILABLE AT THE FOLLOWING STATES DEPARTMENT OF STATISTICS:

Pengarah,
Jabatan Perangkaan Malaysia Negeri Johor,
Tingkat 14, Menara Tabung Haji,
Jalan Air Molek,
80000 Johor Bahru, Johor.
Tel : 07 - 225 3700
Faks : 07 - 224 9972
E-mel : jpjohor@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Perak,
Tingkat 3, Blok A, Bangunan Persekutuan Ipoh,
Jalan Dato' Seri Ahmad Said (Greentown)
30450 Ipoh, Perak.
Tel : 05 - 255 4963
Faks : 05 - 255 1073
E-mel : jpperak@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Kedah,
Aras 1, Zon C, Wisma Persekutuan,
Pusat Pentadbiran Kerajaan Persekutuan,
Bandar Muadzam Shah,
06550 Anak Bukit, Alor Setar, Kedah.
Tel : 04 - 700 1240
Faks : 04 - 733 8412
E-mel : jpkedah@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Perlis,
26B, Aras 2,
KPARC
01000 Kangar,
Perlis.
Tel : 04 - 976 7381
Faks : 04 - 976 8950
E-mel : jpperlis@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Kelantan,
Tingkat 8, Bangunan Persekutuan,
Jalan Bayam,
15514 Kota Bharu, Kelantan.
Tel : 09 - 7419449
Faks : 09 - 7482142
E-mel : jpkelantan@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Selangor,
Tingkat 9, Bangunan Darul Ehsan,
Jalan Indah, Seksyen 14,
40000 Shah Alam, Selangor.
Tel : 03 - 5515 0200
Faks : 03 - 5518 0408
E-mel : jpselangor@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Melaka,
Terengganu, Aras 7 & 8, Wisma Persekutuan,
Jalan MITC, Hang Tuah Jaya,
75450 Ayer Keroh, Melaka.
Tel : 06 - 252 2725
Faks : 06 - 252 2711
E-mel : jpmelaka@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri
Tingkat 9, Wisma Persekutuan,
Jalan Sultan Ismail,
20200 Kuala Terengganu, Terengganu.
Tel : 09 - 622 3062
Faks : 09 - 622 9659
E-mel : jppterengganu@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Sembilan,
Tingkat 12, Wisma Persekutuan,
Jalan Dato' Abdul Kadir,
70000 Seremban, Negeri Sembilan.
Tel : 06 - 765 5000
Faks : 06 - 765 5002
E-mel : jpnsembilan@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Sabah,
Tingkat 1-3, Blok C, Kompleks Pentadbiran
Kerajaan Persekutuan Sabah, Jalan UMS,
Beg Berkunci No. 2046, 88999 Kota Kinabalu, Sabah.
Tel : 088 - 484 602
Faks : 088 - 484 659
E-mel : jpsabah@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Pahang,
Tingkat 7, Bangunan Persekutuan,
Jalan Gambut,
25000 Kuantan, Pahang.
Tel : 09 - 516 3931/7
Faks : 09 - 514 4636
E-mel : jppahang@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Sarawak,
Tingkat 7 & 8, Bangunan Tun Datuk Patinggi
Tuanku Haji Bujang, Jalan Simpang Tiga,
93514 Kuching, Sarawak.
Tel : 082 - 240 287
Faks : 082 - 242 609
E-mel : jpsarawak@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Negeri Pulau Pinang,
Persekutuan, Tingkat 6, Bangunan Persekutuan,
10400, Jalan Anson,
Pulau Pinang.
Tel : 04 - 226 6244
Faks : 04 - 229 9499
E-mel : jpppinang@stats.gov.my

Pengarah,
Jabatan Perangkaan Malaysia Wilayah
Tingkat 14 & 15, Wisma FGV,
Jalan Raja Laut,
50350 Kuala Lumpur.
Tel : 03 - 2267 2400
Faks : 03 - 2274 5075
E-mel : jpwpl@stats.gov.my

Muka surat ini sengaja dibiarkan kosong
This page is deliberately left blank



ISSN 2805-492X



9 7 7 2 8 0 5 4 9 2 0 0 7