

13

GEOGRAPHY, ENVIRONMENT AND POPULATION



Geography, Environment and Population

Location

The Macao Special Administrative Region (MSAR) is an integral part of the People's Republic of China. Situated at the mouth of the Pearl River Delta (PRD) and bordering Guangdong Province, Macao is 60 kilometres from Hong Kong, and the time is eight hours ahead of Greenwich Mean Time. The MSAR comprises the Macao peninsula and two islands: Taipa and Coloane. Its origin point is located at latitude 22°22'40"N and longitude 113°32'22"E. Four bridges – Nobre de Carvalho Bridge, Friendship Bridge (Ponte da Amizade), Sai Van Bridge and the Macao Bridge – link the peninsula to Taipa; while the COTAI Reclamation Area links Taipa and Coloane islands.

According to Chief Executive Notice No. 128/2015 dated 20 December 2015: as stipulated in Order No. 665 of the State Council of the People's Republic of China, the Macao Special Administrative Region comprises land and marine areas, with the land area comprising the Border Gate Macao Checkpoint Building section and the Canal dos Patos section, and the marine area comprising six sections: the Inner Harbour section, Cotai channel section, southern Macao waters section, eastern Macao waters section, artificial island section, and northern Macao waters section. The boundary to the west is meridian 113°31'41.4"E, to the east 113°37'48.5"E, to the south parallel 22°04'36.0"N, and to the north 22°13'01.33"N.

Area

Due to reclamation along its coastline, Macao's total land area has grown from 11.6 square kilometres in 1912, when measurements were first taken, to 33.3 square kilometres in 2024. The Macao peninsula accounts for 9.3 square kilometres (28.0 percent) of the current area; Taipa island for 7.9 square kilometres (23.7 percent); Coloane island for 7.6 square kilometres (22.8 percent); COTAI Reclamation Area for 6.1 square kilometres (18.3 percent); New Urban Zone Area A for 1.4 square kilometres (4.2 percent); New Urban Zone Area C for 0.3 square kilometres (0.9 percent); Macao border crossing area on Zhuhai-Macao checkpoint on the Artificial Island of the Hong Kong-Zhuhai-Macao Bridge for 0.7 kilometres (2.1 percent), and the campus of the University of Macau for one square kilometre.

According to Chief Executive Notice No. 128/2015 dated 20 December 2015: as stipulated in Order No. 665 of the State Council of the People's Republic of China, the Central People's Government explicitly determines that the area of waters of the Macao Special Administrative Region is 85 square kilometres.

Geology and Topography

Macao mainly comprises flat land, terraces and hills. The area of flat land (including reclaimed land) is 24.2 square kilometres, accounting for 72.7 percent of the total; granite hills cover six square kilometres, or 18 percent; and terraces cover 1.2 square kilometres, or 3.6 percent. The terraces are historically areas of denudation, extending along St Augustine, Luis de Camoes Garden, the hill

behind Mong Ha Kun Iam Tong Temple, Russa Hill, and the southern part of Taipa island. Their relatively small area, low elevation (20-25 metres) and gentle slopes mean that most of the terraces are fully utilised. The remaining land – including reserves, monument sites and forests – occupies approximately 1.9 square kilometres, accounting for 5.7 percent of the total land area.

Coastline

According to Executive Order No. 2/2024 dated 8 January 2024, the Macao Special Administrative Region Coastline Map was published to determine the coastline of the Macao SAR, with 1 January 2023 as the baseline date for the revision and survey of the coastline. The total length of Macao's coastline is 79.5 kilometres, 18.5 kilometres of which are around the Macao peninsula; 49.5 kilometres are around the two islands (including Taipa Island, Cotai Reclamation Area and Coloane Island); 5.7 kilometres are around New Urban Zone Area A; 2.7 kilometres are around the Macao border crossing area on Zhuhai-Macao Checkpoint Artificial Island of the Hong Kong-Zhuhai-Macao Bridge; and 3.1 kilometres are around New Urban Zone Area C.

There are two types of coastline in the Macao SAR: artificial and natural coastlines. Artificial coastlines predominate, representing 84.3 percent of the total coastline length, and are mainly around the Macao peninsula and fringing eastern and northern Taipa Island. The natural coastlines mainly fringe western Taipa Island and the southern tip of Coloane Island, representing 15.7 percent of the total coastline length.

Climate

Macao is situated in a subtropical zone, with the Asian continent to the north and a wide tropical sea to the south. In winter, Macao experiences northerly winds, cold and dry weather and low rainfall, due to a cold continental high-pressure system at medium and high latitudes. In summer, Macao is mainly subject to south-westerly winds, hot and wet weather and heavy rainfall, due to the influence of oceanic tropical weather systems. The reverse of wind directions in winter and summer, together with minimal temperature variations during the day, give Macao a marine monsoon climate.

According to the climate normals of the World Meteorological Organisation (WMO), calculated with 30 years of data, the average annual precipitation in Macao between 1981 and 2010 was more than 2,000 millimetres, with most rainfall occurring between April and September. June had the most precipitation – an average of 373.7 millimetres; while December had the least – an average of 31.3 millimetres.

Macao has an average annual temperature of 22.8°C. The coolest month is January, when it averages 15.2°C. Most years, Macao has a short cold weather period when temperatures fall below 5°C. The average monthly temperature exceeds 22°C during seven months of the year, indicating that Macao has a short winter but a long summer.

Macao is frequently hit by typhoons. The typhoon season starts in May and ends in November, with July to September as its peak period.

Weather Overview

General Information

In 2024, Macao's average annual temperature and relative humidity were both higher than the climate normal, with the average temperature tied with 2019 for the hottest year, while the total rainfall was higher than the climate normal, but within the normal range.

Seven tropical cyclones affected Macao in 2024: Tropical Storm Maliksi from 30 May to 1 June, Severe Tropical Storm Prapiroon from 20 July to 22 July, Super Typhoon Yagi from 3 September to 7 September, Typhoon Trami from 25 October to 26 October, Super Typhoon Yinxing from 8 November to 10 November, Typhoon Toraji from 12 November to 14 November and Super Typhoon Man-yi from 18 November to 20 November. Regarding storm surge warnings, three Blue Storm Surge Warnings were issued in 2024 due to the impacts of Prapiroon, Yagi and Man-yi, of which Man-yi caused the highest flooding height of 0.47 metres in the south of the Inner Harbour in the early hours of 19 November.

A total of 47 rainstorm warnings were issued in Macao in 2024, including the Red Rainstorm Warning Signal at night on 30 April, in the afternoon on 12 May, in the morning on 3 June, in the afternoon on 15 June, in the morning on 15 August, in the early morning on 17 August, in the early morning on 18 August and at night on 6 September. The only Black Rainstorm Warning in the year was issued in the morning of 4 May, which was also the only time since 2011 that a Black Rainstorm Warning was issued.

Summary of Severe Weather Warnings Issued in 2024			
Warning / Signal Type		Frequency	No. of Warning Reports Issued
Tropical Cyclone Warning	No. 1 Alert Signal	8	54
	No. 3 Strong Wind Signal	6	44
	No. 8 Northeast Gale Signal	1	18
	No. 8 Southeast Gale Signal	0	0
	No. 8 Southwest Gale Signal	0	0
	No. 8 Northwest Gale Signal	0	0
	No. 9 Increasing Gale Signal	0	0
	No. 10 Typhoon Signal	0	0
Strong Monsoon Warning (Black Ball)		14	59
Rainstorm Warnings	Yellow Rainstorm Warning Signal	55	104
	Red Rainstorm Warning Signal	9	13
	Black Rainstorm Warning Signal	1	1

(Cont.)

Summary of Severe Weather Warnings Issued in 2024

Warning / Signal Type		Frequency	No. of Warning Reports Issued
Thunderstorm Warning		84	214
Storm Surge Alert		0	0
Storm Surge Warning	Blue Storm Surge Warning	3	21
	Yellow Storm Surge Warning	0	0
	Orange Storm Surge Warning	0	0
	Red Storm Surge Warning	0	0
	Black Storm Surge Warning	0	0

Temperatures

Macao had an average annual temperature of 23.6°C during 2024, which was 0.8°C higher than the climate normal and was relatively high compared with the climatic mean, tying with 2019 as the hottest year. The highest and the lowest average temperatures were 28.9°C in July, and 16.7°C in January, respectively. The hottest day was 5 August, when the temperature rose to 35.4°C; whereas the coldest day was 24 January, when the temperature fell to 4.3°C.

Relative Humidity

The average relative humidity during 2024 was 82 percent, which was two percentage points higher than the climate normal. June saw the highest monthly average relative humidity, at 91 percent; whereas the lowest was 64 percent in December.

Rainfall

Total rainfall during 2024 was at a normal level of 2,029.2 millimetres. The highest monthly rainfall was 411.4 millimetres, recorded in August, which was about one-quarter more than the climate average for that month; the rainfall in November was significantly higher due to the impact of tropical cyclones and their rain bands, with 176.6 millimetres of rainfall recorded, which was about four times the climate average for that month, marking it as the second rainiest November since 1952; and there was no record of rainfall in December 2024. The highest daily rainfall was 122.8 millimetres, on 17 August.

Evaporation

The total evaporation level in 2024 was at a normal level of 819.1 millimetres compared to the

climate average. The monthly evaporation levels in February, May, June, September and November were each lower than the climate normal for the same months, while the monthly evaporation levels in January, April, July and August were similar to the climate normal, and those in March, October and December were higher than the climate normal.

Sunshine

During 2024, Macao had 2,295.9 hours of sunshine. The most hours of sunshine were recorded in July, totalling 285.9 hours, which was 74.6 hours above the climate normal for that month. The least hours of sunshine were recorded in February, amounting to 75.8 hours, which was 9.9 hours fewer than the climate normal for that month.

Wind

During 2024, Macao was subject to predominantly northerly winds in January, February, October and December; easterly winds in March, May and September; southerly winds in June and August; and south-southeasterly winds in April and July. Wind speeds averaged 11.6 kilometres per hour.

Meteorological and Geophysical Services

Meteorological and Geophysical Bureau

The Meteorological and Geophysical Bureau (SMG) is supervised by the Secretary for Transport and Public Works. It is responsible for monitoring, analysing and researching, forecasting and warning in the fields of meteorology, aviation meteorology, geophysics and the atmospheric environment.

Apart from hourly real-time weather information, the SMG issues various types of daily weather forecasts for the public, government departments and private institutions. These include five weather reports and forecasts, two marine and weather forecasts for the Macao coastal area, as well as daily weather reports over the past year, which are broadcast daily for the public.

The SMG also provides a 48-hour automatic weather forecast service, which gives hourly forecasts of temperature, humidity, wind speed, wind direction and weather conditions for the next two days on its website and mobile apps for public reference.

The SMG continues cooperating with the Macau Broadcasting Company (TDM). Every day, SMG officers explain the day's weather conditions and the forecast for the following day during the Macau Broadcasting Company's morning and afternoon TV programmes. The SMG forecasters also record weather information regularly, or when necessary, and upload it to the Internet for download and use by various media. This information includes a weather review of the day, a two-day weather forecast and air quality report; a weekly weather forecast; and special weather information (on typhoons, rainstorms, very hot and cold weather).

In response to special weather conditions (such as tropical cyclones that appear likely to enter the South China Sea, heavy rainstorms and significant changes in temperature), the SMG sends special weather notifications to registered users, social welfare organisations and schools via WeChat, mobile apps, SMS and the Meteorological and Geophysical Bureau Telegram Channel.

Whenever a tropical cyclone develops in the northwest Pacific Ocean, the SMG monitors and produces a forecast track reporting its location and intensity in real time and for the next 120 hours. When a tropical cyclone signal is required, the SMG provides a warning signal forecast for the following one to two days, based on a table with forecasts for tropical cyclones and storm surges that is released on its official website. Citizens can learn about the potential impact of tropical cyclones during particular hours and make necessary preparations as soon as possible. When Typhoon Signal No.3 or above is issued, TDM uses split-screen views to announce the latest tropical cyclone news. The SMG also worked with relevant departments to show the latest weather warnings on electronic display screens in the Border Gate checkpoint building and the Outer Harbour Ferry Terminal, such as tropical cyclone and rainstorm warnings, to keep passengers informed regarding the weather.

In recent years, the SMG has continued to enhance its weather forecasts by adopting a “qualitative first, quantitative later” forecasting strategy. The SMG issues qualitative forecasts of severe weather through special push notifications or special weather information one to two days in advance, where feasible, to alert the public of possible weather changes in the near future. In addition, the bureau makes reference to the weather nowcasting system, together with other forecasts or real-time data, to issue early warning alerts and weather warnings one to two hours before the impact of severe weather, so that the public can be prepared in advance.

The Tsunami Warning System developed by the SMG in 2022 came into effect on 1 January 2023.

The SMG has established the Aviation Meteorological Services at the Macau International Airport to provide aviation weather services for airport operators and flight crews. All international flights departing Macao can receive the most up-to-date, international standard aeronautical meteorological documents via the Aviation Weather Information System (AWIS). In 2024, the system typically operated at 100 percent efficiency.

The SMG is committed to promoting meteorological science knowledge through the production of illustrations and videos about science popularisation, and opened the “smgmacau” Instagram account in 2023 to disseminate science knowledge via both conventional and social media platforms.

The SMG received group visits and invited members of civil protection authorities and different social organisations on field exchanges. During the year, there were 92 visits and nine exchange sessions, with a total of about 2,795 visitors. In addition, the SMG organised a wide range of activities, including the “Weather Fun Day” and two parent-child activities, which attracted 1,029 participants; various competitions, including the “Little Weather Reporter Competition” Macao region trial, the “Cloud Art Drawing Contest” and the Campus Weather Monitoring Competition; and 23 drama performances in schools, with an accumulated total of 2,063 participants.

To keep the public informed of potential flooding areas and flood heights during various storm surge warnings, the SMG has posted and regularly updated the Storm Surge Alert labels on the 132 Civil Protection CCTV poles in low-lying areas, at conspicuous spots of over 20 entrances and exits of public car parks under the Transport Bureau, and outside the entrances of over 40 social service facilities under the Social Welfare Bureau and the water level monitoring stations of the SMG.

Monitoring Network

Regarding weather monitoring, the SMG added two new weather monitoring stations in 2024 – at Macao Bridge North and Macao Bridge South, bringing the total to 19 weather monitoring stations, 16 of which provide real-time meteorological information to the public and are located in key locations around Macao and on the cross-harbour bridges, forming an Automatic Weather Station Network that collects weather data 24 hours a day, and shares the information of Taipa Grande using the BUFR code through the Global Telecommunication System (GTS) every hour, while information from three weather stations – Mount Fortress, Taipa Grande and Ka Ho, is released every 15 minutes using the international SYNOP code. Also, the Pearl River Delta Real-time Automatic Weather Station Network was jointly established to exchange meteorological data by the SMG, Guangdong Meteorological Bureau and Hong Kong Observatory.

Regarding meteorological telemetry, the SMG has two ground meteorological reception and processing systems to receive Japanese Himawari satellite information and Chinese FY-2 and FY-4 satellite information; two sets of lightning detectors; a set of centralised lightning information processing systems (the Lightning Location Network in the Pearl River Delta jointly established with Guangdong Meteorological Bureau and the Hong Kong Observatory); one low-level wind profiler; one microwave radiometer; two cloud height meters; and three visibility measuring devices. In addition, the SMG joined hands with the Zhuhai Meteorological Bureau to install one S-band dual-polarisation Doppler weather radar, four X-band phased array weather radars, two low-level wind profilers, and one microwave radiometers in Zhuhai, to monitor weather conditions over Macao and nearby regions.

In terms of meteorological analysis systems, the SMG owns an integrated analysis system for tropical cyclones and storm surges, an ensemble system for predicting storm surges in Macao, and a weather nowcasting system, to analyse the impacts of tropical cyclones and storm surges, and monitor real-time changes in thunderstorms.

The Water Level and Tide Monitoring Network managed by the SMG provides round-the-clock real time data on flooding and tides in flooding black spots and coastal area. The network includes 20 land water level monitoring stations set up at flooding black spots in various districts of Macao (with 18 of these stations providing real-time flooding information to the public), and two tide monitoring stations set up along the coast.

Air quality monitoring

Regarding air quality monitoring, the SMG has established a fully automated air monitoring network to effectively measure major pollutants that jeopardise Macao's air quality. Macao has six automatic air quality monitoring stations, a volatile organic compound monitoring system, and an aerosol light detection and ranging (LIDAR) system for monitoring volatile organic compounds in the ambient environment.

Seismological monitoring

The SMG has a seismological monitoring station in its Taipa Grande headquarters on Taipa,

equipped with a deep shaft (30 metres below ground level) digital seismograph and a strong motion seismograph. In addition, a national seismic information sharing portal was introduced, to receive earthquake information for the entire country. An earthquake-induced tsunami forecasting system was also introduced.

Environmental radiation monitoring

The SMG has set up radiation monitoring stations in its headquarters in Taipa Grande and in the University of Macao, mainly for detecting Gamma radiation dose rates in the atmosphere and announcing the results on the website. A baseline survey on Macao's atmospheric radiation began in 2013. Regular monitoring of Macao's atmospheric radiation is then conducted every year in different districts. Based on the monitoring results, the Atmospheric Environmental Radiation Monitoring Annual Report for the year was compiled and published.

Regional and International Cooperation

The SMG is a member of the WMO. It actively participates in promoting technology, research, training and applications relating to meteorology. Every year, it sends delegations to meetings, seminars, workshops and training programmes arranged by the WMO, the Chinese mainland and overseas meteorological agencies and academic organisations.

The SMG is also a member of the ESCAP/WMO Typhoon Committee. The committee secretariat moved to Macao in 2007.

The SMG keenly takes part in meteorological science meetings and exchange activities conducted by its Chinese mainland and overseas counterparts. Domestic meetings included the Guangdong-Hong Kong-Macao Seminar on Meteorological Science and Technology and the Guangdong - Hong Kong - Macao Meeting on Cooperation in Meteorological Operations organised alternately by the three parties.

Regional and international meetings included:

- The 29th session of the Conference of the Parties (COP29) to the UN Framework Convention on Climate Change;
- The 19th session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP19) and the Sixth session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA6);
- The Third session of the Commission for Weather, Climate, Hydrological, Marine and Related Environmental Services and Applications (SERCOM-3);
- The Third session of the Commission for Observation, Infrastructure, and Information Systems (INFCOM-3);
- The World Meteorological Centre Beijing Workshop on New Technology and Products;
- The WMO and ICAO APAC international Workshop on Aviation Meteorological Science and Service Development;

- The 28th Meeting of the Meteorology Sub-Group of the Asia/Pacific Air Navigation Planning and Implementing Regional Group;
- The 56th session of the ESCAP/WMO Typhoon Committee;
- The 22nd Meeting of the Meteorological Information Exchange Working Group for Asia and the Pacific Regional Office of the ICAO;
- The 20th session of the Forum on Regional Climate Monitoring, Assessment and Prediction for Asia (FOCRAII);
- The 19th Typhoon Committee Integrated Workshop and Roving Seminar;
- The Seventh Annual Meeting of the Working Group on Meteorology of the Typhoon Committee;
- The Typhoon Committee Advisory Working Group Meeting; and
- The Typhoon Committee’s Workshop on Application of Artificial Intelligence in Tropical Cyclone Analysis and Forecasting Technology Exchange.

Air Quality

Population density, scarcity of land, narrow streets and busy traffic all affect Macao’s air quality. However, this is offset to some extent by the low discharge of industrial pollutants. The air quality is therefore generally quite good. Every winter, a comparatively high level of airborne pollutants raises the air pollution index; while in summer the air quality improves, with lower pollution index readings, as the convective precipitation of the tropical climate dispels pollutants.

The SMG revised the definition of the Air Quality Index (AQI) in accordance with the published “Macao Environmental Quality Standards - Ambient Air Quality Standards (trial version)”; the revised AQI was officially adopted from 1 January 2021. The new index further restricts the concentrations of pollutants corresponding to each air quality level, and improves the related preventive measures, and is disseminated hourly via the SMG website and mobile app.

Average air quality of various districts in 2024				
Monitoring Station	Good	Acceptable	Poor (days)	(Very poor) (days)
Macao peninsula roadside	62.6%	33.3%	4.1% (15 days)	----
High-density residential area of Macao peninsula	49.2%	45.4%	5.5% (20 days)	---
High-density residential area of Taipa island	52.2%	43.2%	4.6% (17 days)	---

(Cont.)

Average air quality of various districts in 2024

Monitoring Station	Good	Acceptable	Poor (days)	(Very poor) (days)
Taipa ambient	43.7%	48.9%	7.4% (27 days)	---
Coloane ambient	44.3%	49.5%	6.3% (23 days)	---
Ka Ho roadside	40.7%	49.5%	9.3% (34 days)	0.5% (two days)

In 2024, ozone (O₃) was the main pollutant that led to “poor” or “very poor” air quality in Macao, primarily affecting Macao in summer and autumn. However, in December 2024, there were 11 days when at all stations the 24-hour average concentration of fine particulate matter (PM_{2.5}) exceeded the standard, marking it the month with the most days with poor or very poor air quality throughout the year. The Ka Ho roadside monitoring station recorded the greatest number of days that did not meet the air quality standards (the “poor” or “very poor” air quality days), totalling 36 days and representing 9.8 percent of the year. Overall, the air quality standards (“good” to “acceptable”) were met on over 88 percent of days (322 days) across various districts in 2024.







Average Pollutant Concentrations in 2024

Monitoring Station	Respirable suspended particulates (µg/ m ³)	Fine suspended particulates* (µg/ m ³)	Sulphur dioxide (µg/ m ³)	Nitrogen dioxide (µg/ m ³)	Ozone (µg/ m ³)	Carbon monoxide (mg/m ³)
Roadside	36.0	19.2	3.6	43.2	35.4	0.9
High-density residential area of Macao peninsula	41.2	16.1	4.5	40.7	52.3	0.7
High-density residential area of Taipa island	42.4	20.2	4.5	25.8	48.9	0.7
Taipa ambient	35.7	16.2	4.7	23.4	61.4	0.6
Coloane ambient	30.9	16.4	3.8	22.6	61.3	0.4
Ka Ho roadside	38.2	18.0	4.8	23.0	66.5	0.5

Comparisons between Pollutant Concentrations and the Daily Air Pollution Index (adopted since 1 January 2021)

Air quality index	Respirable suspended particulates 24-hour average ($\mu\text{g}/\text{m}^3$)	Fine suspended particulates 24-hour average ($\mu\text{g}/\text{m}^3$)	Sulphur dioxide 24-hour average ($\mu\text{g}/\text{m}^3$)	Nitrogen dioxide 24-hour average ($\mu\text{g}/\text{m}^3$)	Ozone 8-hour average ($\mu\text{g}/\text{m}^3$)	Carbon monoxide 8-hour average (mg/m^3)
0	0	0	0	0	0	0
50	50	25	20	100	80	5
100	100	50	50	200	160	10
200	250	115	150	700	240	17
300	350	150	475	1,200	400	34
400	420	250	800	2,000	600	46
500	500	350	1,600	2,500	800	57

Air Pollution Index

Air quality index	0 ~ 50	51 ~ 100	101 ~ 200	201 ~ 300	301 ~ 400	401 ~ 500
Air quality level (defined by Macao standards)						

Environment

Environmental Protection Bureau

The Environmental Protection Bureau (DSPA) is a public department in charge of studying, planning, executing, coordinating and promoting environment policies.

Advisory Council on the Environment

The Advisory Council on the Environment is chaired by the Director of the Environmental Protection

Bureau. Members include a maximum of seven representatives of other entities or government departments, and a maximum of 20 other prominent social figures in the environmental protection field.

The major responsibility of the Advisory Council on the Environment is consulting different social sectors regarding Macao's environmental protection, and providing recommendations on the study, formulation, implementation, coordination and promotion of environmental policies.

Noise

There are many reasons for noise pollution in Macao. Urban characteristics – such as population density, busy traffic, narrow streets and the large number of high-rise buildings – create conditions for noise transmission.

Environmental Noise Complaints		
	No. of cases	Year-on-year
Environmental Protection Bureau	1,900	+1.3%
Public Security Police	8,654	+5.3%
Total	10,554	+4.6%

Complaint category	No. of cases	Percentage
Public places	4,121	39.0%
Activities of daily life and domestic pets in residential buildings	3,153	29.9%
Industrial, commercial and service sectors	1,491	14.1%

Environmental Noise Monitoring Network

In order to assess the ambient noise level in different districts, the DSPA has set up six environmental noise monitoring stations – three on the Macao peninsula, one on Taipa island, one in the COTAI reclamation area and one in Coloane. These monitoring stations conduct round-the-clock monitoring of ambient noise, road traffic noise, and noise from the residential zones, by means of an automated network. The data is published on a monthly basis on the Environmental Protection Bureau's website and in the Environmental Geographic Information System. The 2023 Annual Report on Data Collected by Environmental Noise Monitoring Stations of Macao was published in April 2024. In addition, preliminary work on an environmental noise survey commenced in 2024.

Water Quality and Wastewater Treatment

Water Quality

Situated at the mouth of the Pearl River, Macao occupies a peninsula and nearby islands facing Lingdingyang to the east and the South China Sea to the south; there is a wide expanse of water. Water exchanges resulting from tidal flows dilute pollutants entering the area. The Inner Harbour to the west of Macao is a favourite berthing place for Zhuhai and Macao fishing boats. The sluice of the Zhuhai Qianshan River lies upstream of the Inner Harbour channel, and when this is closed the area is partially blocked off. The poor exchange of its waters with the sea results in conditions in which pollutants can accumulate. When the sluice is open, Macao's water quality is determined by the quality of the water in the Qianshan River. Pollutants that have accumulated will then flow to neighbouring waters.

Based on the geographic features of Macao, the Public Health Laboratory of the Health Bureau adopts Category 3 Water Quality Standard of the Sea Water Quality Standard of China (GB3097-97), to assess individual indicators, nutrition indicators and comprehensive indicators of the water quality at each monitoring station.

Water Quality Monitoring Network

In 2024, the Environmental Protection Bureau continued monitoring the water quality and sedimentation in marine areas that are under Macao's management, to enable a more comprehensive understanding of the marine environment. In addition, the Environmental Protection Bureau has set up three automatic environmental water quality monitoring stations – at Ilha Verde Dockyard, Inner Harbour and Cotai Nature Reserve. Round-the-clock monitoring of water quality is conducted through an automated network. The data is published monthly on the website of the Environmental Protection Bureau and in the Environmental Geographic Information System. The 2023 Annual Report on Data Collected by Automatic Water Quality Monitoring Stations of Macao was published in April 2024. In addition, in response to the remediation of the Canal dos Patos, the bureau took over management of the two automatic water quality monitoring stations in Canal dos Patos, to constantly monitor the water quality in the area.

Monitoring Drinking Water Quality

The Laboratory Division of the Municipal Affairs Bureau is responsible for the public water supply network; inspecting the water quality of public water sources and wells; and – if necessary – recommending the closure of these facilities in the public interest. It regularly monitors the quality of water processed by the water supply company, and the public water supply networks and reservoirs in the territory, to verify whether the quality complies with the requirements stipulated in the Decree-Law No. 46/96/M – Rules and Regulations on Water Supply and Drainage in Macao. It collects samples from different water supply points every day and conducts tests on substances such as physicochemical indicators, organic substances, harmful ions, heavy metals, microorganisms, pesticide residues, and radioactive substances. In 2024, a total of 3,356 samples and 53,380 items were examined, and all the results complied with the required standards, demonstrating that the

water quality of the public water supply system is safe and stable.

Since being awarded the ISO/IEC 17025 Certificate of Laboratory Accreditation by the China National Accreditation Committee for Laboratories (CNAL; now China National Accreditation Service for Conformity Assessment) in 2003, the Laboratory Division has enhanced its analytical performance and its quality management system. The laboratory also continued to participate in proficiency tests held by renowned organisations in the Chinese mainland and countries including the United States, the United Kingdom and Australia. The laboratory's inspection technology has fulfilled international requirements. Currently, it possesses 93 and 212 accreditations for water quality certificates and various food certificates, respectively.

Wastewater Management

The six sewage treatment facilities in Macao – the Macao Peninsula Sewage Treatment Plant, Taipa Sewage Treatment Plant, Coloane Sewage Treatment Plant, the Cross-boundary Industrial Zone Sewage Treatment Plant, the temporary sewage treatment plant near the Outer Harbour Ferry Terminal, and the Avenida Marginal do Lam Mau temporary sewage treatment plant – can handle 374,000 cubic metres of sewage per day.

In 2024, the Macao Peninsula Sewage Treatment Plant handled 55,722,392 cubic metres of sewage; Taipa and Macau International Airport Sewage Treatment Plants handled 8,918,763 cubic metres; Coloane Sewage Treatment Plant handled 20,255,614 cubic metres; the Cross-boundary Industrial Zone Sewage Treatment Plant handled 994,930 cubic metres; and the temporary sewage treatment plant near the Outer Harbour Ferry Terminal handled 1,640,363 cubic metres. The public tender procedures for the expansion project of the Coloane Sewage Treatment Plant and the construction project of the Sewage Treatment Plant on the Artificial Island for the Macao boundary crossing area of Hong Kong-Zhuhai-Macao Bridge were completed in 2024.

To improve coastal water quality, once the temporary sewage treatment plant near the Outer Harbour Ferry Terminal in Macao became operational, the construction of the temporary sewage treatment plant at Avenida Marginal do Lam Mau was completed in December 2024, and construction of the temporary sewage treatment plant at Inner Harbour South commenced in November 2024.

Waste Management

Companhia de Sistemas de Resíduos, Lda. (CSR) has been contracted to undertake Macao's household waste collection and conveyance, urban cleaning operations and the cleaning and maintenance of public waste containers, under the Government's supervision. In 2024, the CSR collected about 239,542 tonnes of household waste in Macao.

To help implement the Macao Solid Waste Resources Management Programme (2017-2026), the Environmental Protection Bureau has continued to promote the policy of "Waste reduction at source, sorting and recycling".

In terms of plastic reduction, in addition to Law No. 16/2019 – Restrictions on the Provision of Plastic Bags, the Environmental Protection Bureau continued to foster awareness of plastic reduction in the community through a series of activities such as the Green School Project, the

Plan for Recognition of Eco-Supermarkets, the Macao Green Hotels Award, the “Reducing Plastic is Very Easy”, “Bringing Your Own Water Bottles is Easy” campaigns, and the Scheme for Food Waste Reduction during Macao Food Festival. To further promote plastic restriction measures, the policy of regulating disposable plastic tableware has been implemented in phases, banning the import of disposable styrofoam utensils, non-degradable plastic disposable drinking straws, drink stirrers, knives, forks, spoons, plates, cups and disposable styrofoam food trays to the MSAR.

For the sorting and recycling of the “three-colour resources” (paper, plastic and metal/aluminium cans), the Environmental Protection Bureau continued expanding the community resources recycling network, to provide more accessible recycling channels – including the Environmental Protection Fun corners, the Environmental Protection Fun clean collection spots, the Environmental Protection Fun collection points, mobile recycling vehicles and smart recycling machines. The “Recycling in Buildings is Easy” programme was also launched. After pre-treatment, the recyclables are transported to neighbouring regions for recycling and resource treatment.

Food waste from government departments, schools, hotels, supermarkets, banks, hospitals, associations and institutions is collected through the Food Waste Treatment Demonstration Project. The Restaurant Food Waste Collection Pilot Project collects commercial and industrial food waste from small and medium-sized restaurants. Starting from 5 June 2024, the household food waste collection service of the Environmental Protection Fun corners has been expanded to also cover mobile recycling vehicles and the Environmental Protection Fun clean collection spots. By the end of 2024, more than 58 tonnes of household food waste had been collected through the abovementioned channels. In addition, the Household Food Waste Collection Pilot Project was launched in the fourth quarter of 2024, to set up smart food waste recycling machines in housing estates under suitable conditions. Moreover, construction of the Organic Waste Recycling Centre has commenced.

The collected food waste is transported to Macao Incineration Centre for centralised treatment through the food waste treatment machine and composting facility. After treatment, the food waste is converted to organic fertiliser to be distributed to the public and landscaping companies, free of charge. Over 180,000 small bags (100 grammes per bag) and 9,000 larger bags (20 kilogrammes per bag) of fertiliser were distributed by the end of 2024.

In 2024, the Environmental Protection Bureau again organised the “Recycling Red Packets is Easy” event during Chinese New Year, setting up 58 used red packet distribution points and more than one thousand collection points across Macao, to promote the message on using less new packets, reusing more and making less waste. About 2.52 million red packets were collected (weighing approximately 7.38 tonnes). In addition, the Environmental Protection Bureau again organised the “Recycling Mooncake Boxes is Easy” event during Mid-Autumn Festival in 2024 to promote the environmental message of “reuse first and recycle later”. Over 1,200 mooncake box collection points were set up across Macao, and 18,400 used mooncake boxes (weighing approximately 6.82 tonnes) were collected and recycled.

Macao Waste Incineration Centre

The third phase of the expansion of the Macao Waste Incineration Centre was completed in 2024;

this included the third phase of the Waste Incineration Plant, the new Special and Hazardous Waste Treatment Centre, the new Administration Building and an electricity substation. Macao Incineration Centre is responsible for processing all Macao's solid waste. It comprises three plants with eight processing lines and a total processing capacity of 3,000 tonnes of waste per day. During 2024, the centre processed 580,033 tonnes of solid waste, of which municipal solid waste amounted to 526,979 tonnes. The waste heat produced during the treatment of the municipal solid waste can be recovered and used for power generation. The centre can generate up to 56.7 megawatts per hour of electricity at full load, of which 15 megawatts are used for operations, with the remaining power transferred to the public grid. During 2024, the incineration centre supplied 193,624 units (10,000 kilowatt hours) of electricity to the public grid.

Special and Hazardous Waste Treatment

The new Special and Hazardous Waste Treatment Centre within the Macao Waste Incineration Centre is designed to treat special wastes that are produced in Macao, mainly by using superheating techniques to treat waste materials that cannot be processed by the incineration centre, including discarded tyres, solid and liquid hazardous waste, carcasses of animals such as horses and dogs, slaughterhouse waste, medical waste, and other special and hazardous wastes. In 2024, the waste treatment centre processed a total of 3,759 tonnes of waste (including medical waste), with discarded tyres comprising 17 percent of the total. To encourage special and hazardous waste producers to carry out waste sorting and reduction and to achieve the polluter-pays principle, the MSAR Government intended to set up a charging system for special and hazardous waste treatment stations, and commenced drafting plans for the charging system in 2024 following consultations with industry that commenced in 2023.

A total of 21 fixed collection points and mobile recycling vehicles have been set up under the Electronic and Electrical Equipment Recycling Programme, and free appointment-based pick-up services are provided. By the end of 2024, a total of about 950,000 items of used electronic and electrical equipment were collected. Over 266 tonnes of pre-treated circuit boards have been transported in batches to neighbouring regions for recycling and resource treatment in accordance with the Basel Convention.

Over 1,300 collection points for the Used Battery Collection Scheme have been set up in various districts of Macao. By the end of 2024, over 376 tonnes of used batteries and their components had been collected through the scheme. Of these, over 192 tonnes of pre-treated disposable and lead-acid batteries have been transported to neighbouring regions for subsequent recycling and resource treatment in accordance with the Basel Convention, and 11 tonnes of battery components have been reused as resources.

Over 900 collection points for the "Disposing Used Lamps is Easy" scheme have been set up in various districts of Macao. By the end of 2024, more than 99 tonnes of used lamps and their components had been collected through the scheme. Of these, about 41 tonnes of lighting tubes had been transported to neighbouring regions for subsequent recycling and resource treatment in accordance with the Basel Convention, and 34 tonnes of lighting tube components have been reused as resources.

By the end of 2024, a total of 146 organisations had participated in the “Recycling Glass Bottles is Easy” scheme, with over 5,900 tonnes of glass bottles collected. Crushed glass from recycled bottles will be used as road construction material in Macao, and the remainder of the bottles will be exported to qualified treatment plants for recycling.

In addition, mobile recycling vehicles are parked at 16 different locations around Macao each month on a rotating basis, providing collection services for electronic appliances and devices, used batteries, lamps, glass bottles and the “three-colour resources”. Since June 2024, a food waste recycling service has also been provided.

Treatment of Construction Waste

Since the construction waste landfill commenced operations in 2006, it has been mainly used for the disposal of non-combustible inert solid waste produced through excavation, demolition, and construction. The solid waste includes debris, cement blocks, soft soil, marine clay and furnace slag. In 2024, about 1.89 million cubic metres of construction waste were disposed of. As the construction waste landfills have reached their full capacity, the MSAR Government has introduced an administrative regulation on the Construction Waste Management System, while minimising the pressure on landfills through measures including controlling the increase in volume, minimising the waste and reusing as much as possible. The Environmental Protection Bureau is now conducting an assessment on the future treatment of three types of non-usable construction waste: marine mud, mixed construction waste and furnace slag.

Legislation and Pollution Control

Legislation enacted in 2024 covering environmental issues included:

1. Amendment to the Annex to the Executive Order No. 200/2021 – Approval of the Sale Price, Co-contribution, Guarantee and Costs of Natural Gas for the Wholesale Supply of Natural Gas for Public Services (Executive Order No. 16/2024);
2. Amendment to the Annex to the Executive Order No. 105/2022 – Defining the Values of the Parameters of Electricity Supply Tariffs, Tariff Periods, Subgroups, Bands, Public Electric Charging Tariffs, Normal Electric Charging Tariffs and Specific Provisions for Tariff Support (Executive Order No. 66/2024);
3. Prohibition of the Import and Transshipment of Certain Goods to the Macao Special Administrative Region, Including Adhesives for Building and Renovation Uses Exceeding the Statutory Limit of Volatile Organic Compounds Content (Executive Order No. 80/2024);
4. Substitution of Annex to By-law No. 30/2016 - Limit for Exhaust Gas Emissions from In-use Vehicles and Methods for Measurements, as amended by Executive Order No. 92/2023 (Executive Order No. 101/2024); and
5. Prohibition of the Import, Export and Transshipment of Chemicals Listed in Annex I of the Stockholm Convention on Persistent Organic Pollutants and Goods Listed in Annex II according to Executive Order No. 168/2024.

Environmental Protection and Energy Conservation Fund

The Government established the Environmental Protection and Energy Conservation Fund through By-law No. 21/2011, and on 26 July 2021, By-law No. 25/2021, amending Administrative Regulation No. 21/2011, was promulgated to improve the operation and management of the Environmental Protection and Energy Conservation Fund.

In 2024, the Environmental Protection and Energy Conservation Fund continued to disburse grants under the Recycling Industry Equipment and Vehicle Incentive Scheme, and commenced and implemented the new phase of the Plan for Granting Financial Support for Scrapping Obsolete Motorcycles and Their Replacement with New Electric Motorcycles and the Plan for Granting Financial Support for Scrapping Old Diesel-Powered Vehicles.

To improve Macao air quality and support the dual carbon goals of the country, in 2022 and 2023 the Environmental Protection and Energy Conservation Fund launched the Plan for Granting Financial for the Scrapping of Obsolete Motorcycles and Their Replacement with New Electric Motorcycles, and the Plan for Granting Financial Support for the Scrapping of Old Diesel-Powered Vehicles – both involving two phases – to encourage owners to replace their older, more polluting motorbikes with new electric motorbikes, and to phase out older and more polluting diesel vehicles. The second stages of the two schemes were divided into two phases, and the target groups were expanded to encourage more owners to scrap their old and more polluting motorcycles and diesel-powered vehicles.

Plan for Granting Financial Support for the Scrapping of Obsolete Motorcycles and Their Replacement with New Electric Motorcycles

	Application deadline	No. of applications received	No. of applications vetted	No. of obsolete motorcycles scrapped	No. of new motorbikes registered	Amount of grants involved (10,000 patacas)
1st Phase	1 March 2022 to 31 March 2023	1,822	1,822	1,778 (As of February 2024)	1,767 (As of February 2024)	---
2nd Phase (First application period)	1 June 2023 to 31 May 2024	1,577	1,577 (As of July 2024)	1,558	1,537	550
2nd Phase (Second application period)	1 June 2024 to 31 May 2025	940 (As of the end of 2024)	860 (As of the end of 2024)	751 (As of the end of 2024)	665 (As of the end of 2024)	300

Plan for Granting Financial Support for the Scrapping of Old Diesel-Powered Vehicles

	Application deadline	No. of applications received	No. of applications vetted	No. of obsolete diesel vehicles scrapped	Amount of grants involved (10,000 patacas)
1st Phase	15 September 2022 to 15 March 2023	313 (As of the end of 2023)	313 (As of the end of 2023)	296 (As of the end of 2023)	
2nd Phase (First application period)	1 June 2023 to 31 May 2024	611	611 (As of the end of July 2024)	562	4,400
2nd Phase (Second application period)	1 June 2024 to 31 May 2025	122 (As of the end of 2024)	114 (As of the end of 2024)	94 (As of the end of 2024)	730

Promotion of Environmental Protection Education

With the theme “Building a Low Carbon Macao and Embracing a Green Life”, the Environmental Protection Bureau organised 478 diverse events during 2024, attended by 519,894 participants.

The Environmental Protection Bureau continued to conduct publicity in the community to enhance merchants’ and the public’s understanding of the Restrictions on the Provision of Plastic Bags law; and, continued communicating with the convention and exhibition industry to conduct publicity on the law, reminding industry members that the Restrictions on the Provision of Plastic Bags law applies to retail practices in convention and exhibition activities, with the expectation that the industry would comply with the regulations. In addition, the bureau established a platform to encourage merchant to donate the plastic bag charge to environmental and social welfare organisations.

To support the country’s dual carbon goal and promote the use of electric vehicles, the Environmental Protection Bureau, the Labour Affairs Bureau and relevant organisations jointly organised the Electric Motorcycle Maintenance and Safety Course in December 2024, to support the development of the electric vehicle market and assist the industry with upgrading skills in electric vehicle maintenance and professional safety knowledge.

Since its launch, the Environmental Fun Bonus Points Scheme has gained popular support from the public. By the end of 2024, there were more than 50,000 members. Environmental Protection Fun - waste reduction and recycling encouraged the public to participate in sorting and recycling waste, while Environmental Protection Fun - environmentally-friendly moves encouraged the community to participate in a variety of green behaviour, including through the coordination of a

group of frontline teams (Environmental Protection Fans) to assist in guided tours of Cotai Nature Reserve. In order to support the country's dual-carbon goal and to encourage the public to practice various green behaviour, starting from 5 June 2024, the Environmental Protection Bureau has standardised the bonus points into "Carbon Points", and increased the number of environmental projects for which "Carbon Points" can be exchanged.

In 2024, the Environmental Protection Bureau set up two additional Environmental Protection Fun corners, at Tamagnini Barbosa and Rua do Cunha in Taipa. By the end of 2024, there were eight Environmental Protection Fun corners, 45 community recycling stations and 66 Smart Recycling Machines across Macao.

The Environmental Protection Fun Corner continued to fulfil its functions of recycling and environmental education for the community, and regularly organised Environmental Protection Fun Corner Public Guided Tours. By the end of 2024, 16 tours had been organised for a total of 221 participants; and 382 tours had been organised for schools, organisations, associations and institutions, with a total of 9,190 participants.

The Environmental Protection Bureau organised a series of environmental education events and the Green School Award Project through the Green School Project. In 2024, 54 schools participated in the Green School Awards Project, with 39 schools receiving awards.

The "2023 Macau Green Hotel Awards" were awarded to a total of 15 award-winning hotels, bringing the total number to 54 (the awards are valid for three years). Of these hotels, about 70 percent have conducted carbon audits, which have achieved remarkable results. Regarding waste management, all green hotels have implemented resource recycling, with an accumulated recycling volume of over 72,000 tonnes; about 70 percent of the green hotels have implemented food waste recycling, with an accumulated recycling volume of over 11,000 tonnes. In addition, the green hotels continue providing charging facilities for electric vehicles, with around 300 charging spaces installed, some of which are open for public use.

The Environmental Protection Bureau held the Scheme for Recognition of Eco-Supermarkets 2023 in collaboration with the Municipal Affairs Bureau, the Consumer Council, the Macau Merchandise Merchants Industry Chamber of Commerce and the Macau Union Suppliers Association, with a total of 84 supermarkets participating, resulting in two gold awards, 15 silver awards and 40 bronze awards. The award-winning supermarkets have continued to implement carbon reduction measures such as plastic wrapping reduction, waste reduction and recycling as well as energy saving and emissions reduction, and participating in environmental activities, in order to promote the culture of green consumption.

In addition, by the end of 2024, more than 200 restaurants had participated in the "Cherishing Food is Easy" programme; about 800 buildings had participated in the "Recycling in Buildings is Easy" programme; over 2.8 million customer requests had been recorded for the "Reducing Plastic is Easy" scheme, and it was estimated that 6.1 million sets of disposable utensils had been saved; a total of 82 drinking water dispensers had been set up for "Bringing Your Own Water Bottles is Easy" campaigns in various districts in Macao, with over 5.4 million plastic bottles saved; and over 1,900 tonnes of clothes have been collected through the "Recycling Used Clothes is Easy" programme.

The Environmental Protection Bureau continued to promote the Food Waste Reduction in Macao

Food Festival Scheme by setting up promotion booths and sets of tri-coloured waste separation bins. Meanwhile, students and teachers from “green schools” took part in the Enjoying Food Festivals with DSPA Mascot event. Also, the bureau promoted environmental messages to the public during environmental festivals such as World Wetlands Day, Earth Day, World Environment Day, and encouraged the public to participate in environmental activities and put environmental protection into practice.

The World Wetlands Day is celebrated on 2 February. The Environmental Protection Bureau held the World Wetlands Day 2024 - Environmental Protection Fans Award Ceremony and “Recycling Red Packets is Easy” launch ceremony on 27 January 2024 at Cotai Nature Reserve.

To support the country’s dual carbon target and the implementation of carbon reduction in Macao, the Government has continued supporting the Earth Hour campaign launched by World Wide Fund for Nature (WWF). Under the coordination of the Environmental Protection Bureau, the campaign mobilised government departments, integrated hotels and entertainment enterprises and some large industrial and commercial corporations to turn off unnecessary lights according to their own circumstances for one hour, from 8:30pm on 23 March 2024.

On 22 April, Earth Day, the Environmental Protection Bureau in collaboration with the Marine and Water Bureau and the Municipal Affairs Bureau organised the “Cleaning Beach is Easy” activity at Hac Sa Beach, with about 30 teachers and students joining hands to clean the beach to raise public awareness of environmental protection.

In response to World Environment Day on 5 June, and to encourage all sectors of the community to achieve the country’s dual carbon goal, the Environmental Protection Bureau invited the environmental protection departments of the Guangdong-Hong Kong-Macao Greater Bay Area, and the public authorities, associations, integrated hotels and entertainment enterprises and institutions of Macao to hold the World Environment Day 2024 Activity Series. Activities included “Guangdong-Hong Kong-Macao World Environment Day Carnival”, “Lights-off for 1 Hour” campaign, “Casual Clothing in Summer for Energy Conservation” and “5% Energy Saving” lucky draw.

Regional Cooperation on Environmental Protection

In terms of international environmental cooperation, the Environmental Protection Bureau participated in the 29th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change held in Azerbaijan, in November 2024; the 19th session of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol and the Sixth session of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement – participating together with the national delegation; the 2024 Technical Coordination Group Meeting on the Stockholm Convention Implementation and Technical Exchange Meeting on Synergistic Management of New Pollutants in China, held in Nanchang City, Jiangxi Province in November 2024; and the 22nd China International Environmental Protection Exhibition, held in Beijing.

To strengthen exchanges and cooperation on environmental protection between the Chinese mainland and Macao, in March 2024, the MSAR Government and the Ministry of Ecology and Environment held the second inter-ministerial liaison work conference on the Agreement on Cooperation in Environmental Protection Between the Chinese Mainland and the Macao SAR.

The Macao International Environmental Co-operation Forum and Exhibition 2024 (2024MIECF) was organised by the MSAR Government in March, with the National Development and Reform Commission, the Ministry of Science and Technology, the Ministry of Industry and Information Technology, and the Ministry of Ecology and Environment as special sponsors; the Pan-Pearl River Delta provincial/regional governments as co-organisers; and the Commerce and Investment Promotion Institute, and the Environmental Protection Bureau as official contractors. The event theme was “Reaching the Dual Carbon Goal through Green Transformation”, which aimed to promote green and sustainable development in line with the country’s dual carbon goal and the MSAR Government’s key policies on environmental protection, including the Long-term Strategy for Carbon Reduction in Macao.

MIECF invited over 30 local and overseas experts and academics to discuss ESG (environmental, social and corporate governance), green finance, carbon neutrality and green transformation during four Green Forums. The Green Showcase featured five zones with more than 400 exhibitors showcasing carbon neutral technologies, energy management, water management, green transportation, ecological city integration, green buildings and other green products and services, and a Green Smart Industry Exhibition Zone to enable connections with green technologies and supply chains, helping enterprises to upgrade and achieve green transformations. The Green Public Day allows the public to learn about the latest environmental information and technologies, and promotes the practice of green and low-carbon living.

Regarding environmental cooperation in the Pan-Pearl River Delta Region, the Environmental Protection Bureau attended the 20th Coordinator Working Meeting of the Joint Conference on Pan-Pearl River Delta Regional Environmental Protection on October 2024 through video conferencing.

In December 2024, Guangdong, Hong Kong and Macao jointly announced the 2023 Report of the Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network, which shows that there has been a notable and continuous downward trend of various air pollutants in the Pearl River Delta Region.

Under the Guangdong-Macao Environmental Protection Cooperation Agreement, the two parties continued to exchange views and cooperate in various areas, including joint prevention and control of ambient air pollution, water environment management, recycling scrapped vehicles and waste paper, environmental industries, publicity and education.

Regarding Hong Kong-Macao environmental cooperation, in July 2024, the 16th Meeting on Environmental Protection Cooperation between Hong Kong and Macao was convened in Hong Kong. The parties exchanged views on carbon reduction strategies, hydrogen development strategies, commercial and household food waste recycling programmes, environmental exhibitions and seminars, and discussed plans for future cooperation. In addition, in October 2024, the Environmental Protection Bureau sent a delegation to attend the Eco Expo Asia 2024, in Hong Kong.

Under the framework of the Zhuhai-Macao Environmental Protection Cooperation Agreement, the Zhuhai-Macao Environmental Cooperation Working Group Meeting 2024 was held in Macao in October 2024. The two parties reviewed the environmental cooperation projects in the past year, and exchanged views on marine pollution governance, atmospheric environment quality, communication on environmental emergencies, exchanges on ecological issues, environmental protection industry and promotion of environmental protection education. There were also discussions on plans for

cooperation in the coming year. In addition, the Environmental Protection Bureau sent a delegation to attend the World Environment Day Activities 2024, held in Zhuhai.

Environmental Protection Planning in Macao

The Environmental Protection Bureau continued to make progress with the various tasks involved in the Implementation of the Environmental Protection Plan of Macao (2021-2025), as well as reviewing and evaluating its implementation in order to ensure its effectiveness. To support the national goal of “dual carbon”, in December 2023 the Environmental Protection Bureau announced the Long-term Strategy for Carbon Reduction in Macao, which serves as a blueprint for the region’s efforts in carbon reduction, and continued promoting and coordinating the related work.

To make the List of Types of Projects Requiring Environmental Impact Assessments more operational, the Environmental Protection Bureau conducts reviews on a regular basis. After reviewing the actual implementation of the related work, making reference to the experience of EIA work in other countries and neighbouring regions, as well as integrating the opinions and suggestions from related government departments, organisations and the industry, the revised 2024 version of the List of Types of Projects Requiring Environmental Impact Assessments has been completed. It was published on 5 June 2024 and adopted with effect from 1 January 2025.

Environmental Data

In June 2024, the Environmental Protection Bureau published the Report on the State of the Environment of Macao 2023, which introduced various aspects of Macao’s environment and trends reflecting ways they are changing, as well as the effectiveness of responses to environmental issues, in order to promote awareness of and participation in environmental protection among all sectors of the community.

Complaints received by the Environmental Protection Bureau in 2024:

Category	Number of cases
Noise	1,677
Air pollution	390
Noise and air	113
Noise and other	110
Air and other	50
Environmental hygiene	41
Other	158
Total	2,539

Technical advice provided at the request of other departments in 2024:

Department	Premises and projects	Nos.
Tourism Office	Premises including karaoke bars, bars, hotels, restaurants, sauna and massage establishments, dance halls and health clubs.	458
	Inspections before issuance or renewal of licences	121
	Technical advice	7
Economic and Technological Development Bureau	Technical advice	1
	Inspection of industrial sites	18
	Technical advice on import applications for HCFCs as “Controlled Substances” under Decree-Law No. 62/95/M	29
Land and Urban Construction Bureau	Project plans including piling foundation (environmental protection) projects and applications for extension of construction time, construction plans, expansion plans, modification of / legalisation on construction projects	273
	Maps of urban conditions	59
	Technical advice	120
Municipal Affairs Bureau	Technical advice on licensed premises	462
	Site inspections	185
	Project plans	63
	Technical advice	35
Public Works Bureau	Project plans	418
	Technical advice	90
Meteorological and Geophysics Bureau	Technical advice	17
Cultural Affairs Bureau	Technical advice	11
Customs	Inspection	322
Other departments	Technical advice	37

Moreover, in 2024 the Environmental Protection Bureau provided 311 technical recommendations on environmental planning assessment areas, and received 14 environmental impact assessment reports on new projects and related information.

Flora

Macao abounds in plant species. More than 1,500 species of vascular plants have been identified in Macao. These are mainly found in woodlands, parks and leisure grounds. Most of Macao's vegetation belongs to the evergreen broad-leaf woodland, tree, shrub and coastal bush groups, including such species as Rose Myrtle (*Rhodomyrtus tomentosa*), Blood-red Melastoma (*Melastoma sanguineum*), Oblong leaved Litsea (*Litsea rotundifolia* var. *oblongifolia*), Pop-gun Seed (*Bridelia tomentosa*), Hong Kong Hawthorn (*Rhaphiolepis indica*) and Linear Forked Fern (*Dicranopteris*). The most common species of cultivated plants are the Chinese Hibiscus (*Hibiscus rosa-sinensis*), Hong Kong Orchid Tree (*Bauhinia blakeana*), Sunshine Tree (*Cassia surattensis*) and False Groundnut (*Desmodium heterocarpon*). Also, Macao has 104 species of bryophytes which belong to 34 genera and 63 families. Rare species include *Fissidens macaoensis*, *Kurzia sinensis*, *Phaeoceroa laevis*, *Notothylas japonica* horik, *Micromitrium* and *Vesicularia*. *Fissidens macaoensis* is a new species to science, which was officially announced in 2011. As it was discovered in Macao, its Latin name includes "Macao".

The terrestrial vegetation in Macao has a relatively diverse plant community. Types of vegetation can be identified: coniferous forests, mixed conifer broadleaf forests, evergreen broadleaf forests, mixed evergreen deciduous plants and scrublands. Forest areas on Taipa and Coloane have undergone a compositional transformation. A firebreak was set up, and many indigenous tree species were introduced, including Melia-leaved Evodia (*Tetradium glabrifolium*), Hong Kong Gordonia (*Gordonia axillaris*), Acronychia (*Acronychia pedunculata*), Morris's Persimmon (*Diospyros morrisiana*), India Carallia (*Carallia brachiata*), Yanmin (*Dracontomelon duperreanum*), Persimmon-leaved Litsea (*Litsea monopetala*), *Michelia chapensis*, Burmese Rosewood (*Pterocarpus indicus*), Heterophyllous Winged-seed Tree (*Pterospermum heterophyllum*), Silver-back Artocarpus (*Artocarpus hypargyreus*), Pinus elliottii×Pinus oaribaea, Common Fig (*Ficus carica*), Horse-tail Pine (*Casuarina equisetifolia*), Chinese Holly (*Ilex rotunda*), *Michelia macclurei* and Chinese Guger Tree (*Schima superba*).

In addition to leafy plants that were commonly used in the past – namely the Dwarf Yellow (*Duranta repens*), Golden Leaves (*Ficus microcarpa*), Bridal Wreath (*Stephanotis floribunda*), Fukien Tea (*Ehretia monopyrena*), Cochin-china Excoecaria (*Excoecaria cochinchinensis*) and Ivy Tree (*Schefflera heptaphylla*) – colours were added to the green belts to improve greening of streets in Macao and create a better view by growing colourful flowering shrubs, such as Ti Plant (*Cordyline fruticosa*), Britton's Wild Petunia (*Ruellia brittoniana* Leonard), Hawaiian Hibiscus (*Hibiscus rosa-sinensis*), Yellow Allamanda (*Allamanda cathartica*), Purple Allamanda (*Allamanda blanchetii*), Indian Canna (*Canna indica*), Dwarf Umbrella Tree (*Schefflera arboricola* 'Variegata') and Red Strap Flower (*Loropetalum chinense* f. *rubrum*) in recent years. The view looks more layered with the addition of these flowers, together with trees such as Terminalia (*Terminalia mantaly* H. Perrier), Chinese Holly (*Ilex rotunda*), Chittagong Chickcrassy (*Chukrasia tabularis*) and Lance-leaved Sterculia (*Sterculia lanceolata*).

Woodland Recovery

Macao was hit by strong typhoons Hato and Mangkhut in 2017 and 2018, which caused severe damage to forest ecosystems.

In the fourth quarter of 2018, with support from the Chinese Academy of Forestry of Guangdong Province, which is directly under the Forestry Administration of Guangdong Province, the Municipal Affairs Bureau commenced the first stage of woodland recovery. The recovery work was completed in two phases. In the first phase of the woodland recovery, guided by the Forestry Administration of Guangdong Province, with the assistance of Chinese Academy of Forestry of Guangdong Province, a total of 35,000 saplings were replanted or transplanted. Damaged woodland within five metres to ten metres from 11 trails was restored, covering a total area of 35 hectares. The recovery work was completed in September 2019, with a remarkable result of over 98 percent survival rate of the saplings, which bloomed and bore fruits in spring and summer 2020. The second phase of woodland recovery commenced in the fourth quarter of 2019, as planned by the Municipal Affairs Bureau, covering an area of about five hectares. In all, 5,000 saplings were replanted or transplanted. The first stage (first and second phases) of emergency ecological recovery was completed in 2020, with a total recovery area of 40 hectares and a high survival rate and good growth rate of over 40,000 seedlings planted.

The second stage of woodland ecology recovery (third to sixth phases) commenced in the fourth quarter of 2021, focusing on overall improvement and enhancement. It is expected this will be completed in about five to ten years, with the goal of restoring an area of at least 120 hectares by 2024. With the assistance of the Guangdong Forestry Science Academe, the third phase of woodland recovery commenced in September 2021 and completed in August 2022 according to the forestry design plan, and included the thinning and removal of dead trees, covering an area of about 15 hectares. In all, approximately 15,000 saplings were replanted or transplanted. The fourth and the fifth phases of woodland recovery were completed in August and November 2023, respectively, with a recovery area of 35 hectares in both phases, and about 35,000 saplings were planted during both phases. In addition, the sixth phase of the woodland recovery plan, covering 35 hectares of area, was completed in August 2024, with about 43,000 saplings of indigenous South China trees planted, thereby achieving the target of recovering a total area of 120 hectares of woodland.

After six phases of woodland recovery, over 160,000 seedlings of more than 100 species have been planted. Some of the planted seedlings have been growing for more than five years, and some trees have grown to a height of three to five metres. The ecological benefits and biodiversity of the woodland have been greatly enhanced. However, the woodland is still in the growth stage, and the damage caused by *Mikania micrantha* needs to be monitored, with this fast-growing creeper requiring ongoing clearance efforts.

Fauna

Macao is small. The development of land and expansion of urbanisation affect and damage the survival and scope of activities of wild animals. The numbers of species and populations of wild animals in Macao are decreasing. The scarcity of unpolluted waters in Macao leads to a decrease in the diversity and numbers of amphibians. The commonest species are Asian Common Toad (*Bufo*

melanostictus) and Ornate Pygmy Frog (*Microhyla ornata*). In the hilly forest area of Coloane, the Municipal Affairs Bureau has constructed artificial freshwater wetlands as better habitats for amphibians.

The commonest wild mammals are bats, rats and Red-bellied Tree Squirrels. Bats mainly inhabit Coloane and Taipa. The Japanese House Bat (*Pipistrellus abramus*) and Short-nosed Indian Fruit Bat (*Cynopterus sphinx*) can be found on the Macao peninsula. The former frequents gaps between buildings and lives on mosquitoes and flies, helping to limit populations of harmful insects. The latter eat fruits in parks or woods, and may help spread their seeds, contributing to the city environment and natural environment of the woods. The Red-bellied Tree Squirrel (*Callosciurus erythraeus*) is an exotic species, which has now become established in the wild in Macao. Its lack of natural enemies makes it a threat to other animal species, notably as squirrels eat bird eggs, thus endangering birds' reproductive success. Eurasian Otters (*Lutra lutra*) have been recorded in Macao in the past, and were again found in 2024.

Reptiles, especially snakes, play an important ecological role in controlling the number of rats. The common Chinese Rat Snake (*Ptyas korros*), Oriental Rat Snake (*Ptyas mucosa*) and Asiatic Water Snake (*Fowlea piscator*) are non-venomous, while common venomous species include White-lipped Pit Viper (*Trimeresurus albolabris*) and Taiwan Cobra (*Naja atra*). Two rare species, Many-banded Krait (*Bungarus multicinctus*) and Burmese Python (*Python bivittatus*), were recorded several times in 2019. However, Macao's dense population poses an enormous threat to their dwelling and foraging areas. In addition, some people's misunderstanding and fear about snakebites have caused the number of snakes to decrease most significantly among all wild animals in Macao.

Previous studies recorded over 300 species of birds in Macao. A total of over 290 species of birds has been recorded from 2006 to the present.

There are abundant fish stocks in Macao, which can be categorised into saltwater fish, brackish fish and freshwater fish. Saltwater fish and brackish water fish mainly refer to the fish off the coast of Macao. There are approximately 200 species of these fish. Freshwater fish most need protection in the natural environment. Although the habitats of freshwater fish and amphibians are similar to each other, the former have a narrower sphere of activities. Whenever the environment is destroyed or altered by human activities, they are often affected most directly.

There are over 700 species of insects, which are widely distributed in Macao, including 150 ant species, over 100 butterfly species and more than 40 dragonfly species.

Laws Governing Nature Conservation

Macao began to enact laws and regulations on nature conservation – including the establishment of nature reserves and the protection of flora and fauna of special interest – more than 40 years ago. New by-laws were promulgated in 2004 to replace older ones. They are as follows:

1. Decree-Law No. 33/81/M, gazetted on 19 September 1981; Decree-Law No. 30/84/M, amended on 28 April 1984; and Decree-Law No. 3/99/M, revised on 25 January 1999, which designated a 196,225-square-metre area of Seac Pai Van Country Park as a conservation area of outstanding educational, ecological, scenic and scientific value.

2. Law No. 11/2013, approved by the Legislative Assembly on 13 August 2013, and By-law No. 31/2018 enacted on 4 May 2018, designated part of Coloane island with an altitude of 80 metres or above as a buffer zone. Under the same law, Executive Order No. 118/2024 – List of Protected Old and Valuable Trees, promulgated on 22 July 2024, provides effective protection for the listed trees.
3. The Environmental Law, approved by the Legislative Assembly on 31 January 1991 and gazetted by Law No. 2/91/M on 11 March 1991, which set out general guidelines and basic principles for the formulation of environmental policies.
4. General Regulations Governing Public Places (By-law No. 28/2004) enacted on 28 July 2004, which established general principles for behaviour to be observed when using and enjoying public places.
5. By-law No. 15/2022, amending Sanitary and Phytosanitary Control (By-law No. 40/2004) enacted on 14 December 2004, came into effect on 16 April 2022. And from 1 January 2022 onwards, sanitary quarantine and phytosanitary quarantine will be applied to imports and transshipments of goods listed in Annex III of the constituent parts of Executive Order No. 209/2021, and implemented Chief Executive Order No. 245/2014 on the List of Regulated Quarantine Plant Pests of the Macao SAR.
6. The Animal Protection Law (Law No. 4/2016) came into effect on 1 September 2016, with regulations on keeping, managing and selling animals, and the use of animals in public exhibitions and scientific applications. In addition, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Biological Diversity, and the International Plant Protection Convention (Chief Executive Notice No. 20/2006 announces that the Convention came into effect on 20 October 2005 for the People's Republic of China, including the Special Administrative Region) have been made applicable to Macao, thus ensuring that Macao's nature conservation policies conform to international practices.
7. To ensure the enforcement of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in Macao, the Legislative Assembly of the Macao SAR deliberated and passed Law No. 2/2017 regarding the convention, and the Chief Executive has formulated the Administrative Regulation No. 19/2017 in the same year, to supplement the law; and later implemented the amended Annexes I, II and III to CITES effective from 23 February 2023 by Chief Executive Notice No. 3/2024.

Nature Reserve

The Taipa-Coloane Wetland Reserve managed by the Environmental Protection Bureau is situated adjacent to the Lotus Flower Bridge in Taipa and Coloane. It has a total area of 55 hectares, including a 40-hectare bird foraging area that is regarded as zone two of the reserve, on the west coast of reclaimed area between Taipa and Coloane. Next to this zone is a 15-hectare bird habitat, regarded as zone one of the reserve, which provides different bird species (including the rare Black-faced Spoonbill) with suitable habitats.

As at the end of 2024, the Cotai Nature Reserve’s known plant species included 327 species of planktonic algae, four species of bryophyte, 22 species of pterophyte, 11 species of gymnosperm, and 413 species of flowering plants. Regarding animal species, 143 plankton species, 176 zoobenthos species, 654 species of insects, 118 species of fish, five species of amphibians, 22 species of reptiles and 12 species of mammals were recorded. The abundant food resources have attracted 198 species of birds to forage and roost in the nature reserve, including the globally rare Black-faced Spoonbill (*Platalea minor*).

A series of events in the Cotai Nature Reserve were held monthly by the Environmental Protection Bureau, including the Cotai Nature Reserve Open Day, the “Nature School” family workshop, and bird watching in nature reserves during migratory bird seasons from November to April the following year, while Ichthyology Workshops were held in other seasons to raise public awareness of environment protection.

Country Parks

There are four country parks in Macao: Seac Pai Van Country Park, Taipa Grande Nature Park, Hac Sa Reservoir Country Park, and Ka Ho Reservoir Country Park.

Seac Pai Van Country Park

Situated to the west of Coloane, Seac Pai Van Country Park is bounded by quarries to the north, Seac Pai Van Road to the west, Estrada do Alto de Coloane to the south, and Estrada do Militar to the east, covering an area of approximately 198,000 square metres. The park was established by legislation as a reserved zone in 1981 for its educational, ecological, scenic and scientific values, pioneering nature education in Macao. In 1984, it became the first country park in Macao.

Giant Panda Pavilion

Set against a hill side in Seac Pai Van Park of Coloane, with a fan-shaped layout and an area of about 3,000 square metres, Macao Giant Panda Pavilion is designed to combine the terrain’s natural undulations with the architectural characteristics. The pavilion comprises two 330-square metre indoor activity quarters and two 300-square metre outdoor yards. The appearance of the Macao Giant Panda Pavilion is designed to mimic nature, and it features green elements with leisure facilities such as pools and wooden climbing frames for the pandas.

Taipa Grande Nature Park

Taipa Grande Nature Park is on the east of Taipa island, and covers a wooded and hilly area between Ponta da Cabrita Road, Governador Nobre de Carvalho Avenue and Padre Estevao Eusebio Situ Road. It has an observation deck, a viewing pavilion, a children’s playground, a barbecue area, a circular plaza, a green promenade, a grass skiing slope, a trail and a camellia garden, while serving as a multifunctional park for relaxation, exercise, environmental protection, education, and retreat. It is also an ideal destination for Macao residents to enjoy forest scenery to the full, embrace nature

and enrich their leisure time. The total area is approximately 559,000 square metres.

Hac Sa Reservoir Country Park

Hac Sa Reservoir Country Park is situated in a hilly forest area on the south-eastern slopes of the central mountain of Coloane. The park occupies 377,000 square metres between the entrance of the Grand Coloane Resort on Hac Sa Road to the east, and Chu Ku Tong pond, in front of Man Hong Un, to the south. The park is named after Hac Sa Reservoir due to this being its most distinctive geographical feature. The trail at the top of the Hac Sa Reservoir dam is temporarily closed due to safety risks.

Ka Ho Reservoir Country Park

Ka Ho Reservoir Country Park is situated on the northeast of Coloane island. The park faces Ka Ho Village to the east, separated by Barragem de Ka Ho Road. Seac Pai Van Reservoir lies to its west; and the golf course and Alto de Coloane Road lie to its south. It is bordered by a road that leads to the youth challenge centre in the north; and it stretches all the way down to a wooded and hilly area by the shoreline. Ka Ho Reservoir Country Park has an area of approximately 507,000 square metres. With Ka Ho Reservoir as its central point, the park boasts various facilities, including the Ka Ho Reservoir Trail, Northeast Trail and Little Spring; as well as barbecue, and picnic areas; an outdoor experience camp; and a freshwater-wetland ecological zone.

Population

Macao's resident population was 688,300 at the end of 2024, representing a slight increase of 4,600, or 0.7 percent, over the previous year. An estimated 46.3 percent of Macao's population were males, and 53.7 percent were females.

The local population was 568,700 at the end of the year, representing a decrease of 2,500, or 0.4 percent, over the previous year. The number of foreign employees residing in Macao increased by 5.7 percent to 91,400, while the number of foreign students residing in Macao increased by 8.5 percent to 28,200.

Natural factors are among the reasons for the increase in population. In 2024, there were 3,607 new-born babies, 2.8 percent fewer than in 2023, and 2,477 deaths, 16.9 percent fewer than in 2023. The natural population growth rate rebounded by 0.5 percentage point to 0.16 percent. The median age of mothers giving birth to their first child was 31.3 years old, representing a year-on-year increase of 0.3 years.

On top of this increase, there was a change in immigration, another factor influencing population. The net number of immigrants was 3,500 in 2024, largely attributed to more foreign employees residing in Macao.

Regarding the population distribution by statistical district, most residents lived in Baixa da Taipa, with 75,600 residents, comprising 11.0 percent of the total population, followed by Areia Preta New Reclamation Zone (10.3 percent) and Areia Preta and Iao Hon Districts (9.8 percent).

Lam Mau Tong district (+1,800 residents) and the Coloane district (+1,500 residents) saw the highest increases in population compared to 2023.

According to immigration data, in November 2024, there were 22,800 Macao citizens active in Macao and residing in Zhuhai and its neighbouring areas, representing a year-on-year increase of 14 percent, of whom 53.1 percent were males; and 55.7 percent were aged between 25 years and 54 years. The number of households at the end of the year was 205,000, representing a year-on-year increase of 600 households.

Birth and Death Rates

In 2024, the birth rate was 0.53 percent, representing a drop of 0.02 percentage points, while the death rate was 0.36 percent, representing a decrease of 0.08 percentage points from 2023.

Population Ageing

Macao's population is ageing because of the increasing life expectancy. Senior citizens (aged 65 years or above) made up 14.6 percent of the population, 0.6 percentage points more than the previous year; the number of other adults (aged 15-64 years) increased by 0.2 percentage points, representing 73.0 percent of the population; the population of young children decreased by 0.7 percentage points to 12.5 percent; the aging index rose to 116.6 percent. The ageing in the population of Macao people is more significant, with 17.6 percent represented by senior citizens (aged 65 years or above), representing an increase of 0.9 percent; and a decrease of 0.2 percentage points to 67.3 percent in other adult population (aged 15 years to 64 years). The elderly dependency ratio of the population of Macao people was 26.1 percent, an increase of 1.3 percent, which means there was one senior citizen for every 3.8 adults. Young children (aged 0-14) made up 15.1 percent of the population, 0.7 percentage points lower than the previous year.

Identification Services Bureau

Under the Basic Law of the Macao SAR, the Macao Special Administrative Region Government is authorised by the central government to issue MSAR Passports to Chinese citizens who hold MSAR Permanent Resident ID cards, and to issue other types of MSAR travel permits to other legal residents of Macao. MSAR Passports and travel permits are valid for worldwide travel, and entitle their holders to return to Macao.

The Identification Services Bureau is under the administration of the Secretariat for Administration and Justice, and is responsible for the overall planning and work relating to the civil and criminal identification of Macao residents. It issues ID cards and certificates of criminal record, certificates to substantiate the facts stated in official record, MSAR Passports, and other travel permits to Macao residents. It also responsible for handling nationality applications from MSAR residents, receiving and handling applications for Certificate of Entitlement to Right of Abode and issuing the related certificates, arranging the registration of associations and syndicates qualified as juridical persons and issuing the related certificates, as well as other duties as vested by law.

Personal Identity Cards

Only Chinese citizens who are permanent residents in Macao with a Macao Resident ID card are eligible to apply for an MSAR Passport. A Chinese citizen who is a Macao Resident ID cardholder, but not a permanent resident of Macao and not eligible for other travel permits, may apply for an MSAR travel permit.

By 31 December 2024, the Identification Services Bureau had issued 979,794 MSAR Passports and 65,182 travel permits.

Under the Nationality Law of the People's Republic of China and the Interpretation by the Standing Committee of the National People's Congress on Several Questions Relating to the Application of the Nationality Law of the People's Republic of China in the Macao Special Administrative Region, any permanent resident of Macao with Chinese nationality and a Portuguese travel document may travel to other countries or regions with the Portuguese travel document as before. Therefore, such people may hold both a Macao SAR Passport and a Portuguese travel document at the same time.

The Identification Services Bureau is responsible for issuing Visit Permits for Residents of the Macao SAR to the Hong Kong SAR (also known as "Visit Permits to the HKSAR"). Residents of the MSAR who are either Chinese or Portuguese citizens and who hold a Macao Resident ID card or an MSAR Resident ID card may apply for Visit Permits to the HKSAR. The bureau had issued 464,616 such permits as at 31 December 2024.

The Identification Services Bureau is also responsible for issuing Macao SAR Resident ID cards. As at 31 December 2024, there were 753,661 Macao SAR Resident ID card cardholders. Between 1 January 2024 and 31 December 2024, 10,501 residents received Macao SAR Resident ID cards for the first time.

Nationality

Under Law No. 7/1999, the Identification Services Bureau is responsible for handling nationality applications from MSAR residents, including applications by foreign nationals or stateless persons for naturalisation; applications by Chinese citizens to renounce Chinese nationality; applications by foreigners who previously had Chinese nationality to restore Chinese nationality; applications by MSAR residents of both Chinese and Portuguese descent to choose either Chinese or Portuguese nationality; and applications by original Macao residents who are Chinese citizens with other nationalities to adopt Chinese nationality.

Between 20 December 1999 and 31 December 2024, 1,491 applications for naturalisation were approved; 585 people restored their Chinese nationality; 125 renounced their Chinese nationality; 4,181 successfully applied to adopt Chinese nationality; 168 opted for Portuguese nationality; and there were 10 applications for change of nationality.

Certificate of Entitlement to Right of Abode

A certificate of entitlement to right of abode confirms the status of a permanent resident of the

MSAR. Any person who claims to have right of abode in the MSAR but does not hold a valid Macao Resident ID card or MSAR Resident ID card and who does not live in any other region of the People's Republic of China (except the Hong Kong SAR and Taiwan) must apply for a certificate of entitlement to right of abode.

Such people include Chinese citizens who have ordinarily resided in Macao for seven consecutive years before or after the establishment of the Macao SAR; children of Chinese nationality born outside Macao whose parents are Chinese nationals and permanent residents of Macao; people of both Chinese and Portuguese descent who have ordinarily resided in Macao for seven consecutive years before or after the establishment of the MSAR; and children of Chinese nationality or children born outside Macao who have not selected a nationality but intend to reside in Macao permanently and whose parents are permanent Macao residents of either Chinese citizenship or Portuguese descent. The certificate of entitlement to right of abode indicates its date of effectiveness, prior to which holders of the certificate have no right to enter or reside in Macao.

Between 20 December 1999 and 31 December 2024, the Identification Services Bureau issued 86,924 certificates of entitlement to right of abode.

Certificate of Criminal Record

In August 1996, the Identification Services Bureau started to issue certificates of criminal record and certificates of special record for minors. The former is the sole and sufficient document to prove whether an applicant has any criminal record; while the latter is applicable to those under 16.

Between 1 January and 31 December 2024, the bureau issued a total of 79,788 certificates of criminal record. Of these, 65,453 were in response to public applications, and 14,335 were for agency applications. Among the 87 certificates of special record for minors that were issued, 10 were to public bodies, and 77 were to minors applying through an agency.

Immigration Controls

According to the Basic Law of the Macao SAR, the Government may impose restrictions on people from other countries or regions entering, staying in, and leaving Macao. The Immigration Department of the Public Security Police is responsible for entry and exit in Macao. The MSAR Immigrant Department records the entry and exit of non-residents, as well as their passport, visa, or other relevant documents for reference; and collect biometrics for identification when necessary.

By 31 December 2024, citizens of 82 countries enjoyed visa-free access to Macao. Valid passport holders of these countries and regions may enter and stay in Macao for 14 to 90 days, while those from certain countries may stay for up to six months.

Legal Immigration

In 2024, the number of new immigrants from the Chinese mainland holding one-way permits increased by 110 from the previous year, to 3,346, with the number of new immigrants from Guangdong province increasing by 138 to 2,303, 66.52 percent of whom were female and 33.48

percent were male. Among new immigrants, 27.35 percent were aged below 30 years, representing a drop of 2.66 percent.

Overstaying and Illegal Entry

In 2024, 14,554 overstayers were repatriated. They included 13,906 Chinese mainland citizens, 56 Taiwan region citizens, 35 Hong Kong citizens, 557 foreign nationals, and 12,749 voluntarily repatriated Chinese mainland citizens.

Civil Registration

The Civil Registry is responsible for implementing regulations relating to the civil registration of births, parentage, adoption and child custody, marriage agreements, deaths, legal certification of the deaths of missing persons, and issuing relevant certified documents.

Birth Registration

The Birth Registry is responsible for the registration of births in Macao, as well as the re-registration of births of people aged 14 or over. The Civil Registry should be verbally notified of any birth in Macao by the parents or guardians within 30 days. There were 3,703 registered births during 2024.

Marriage Registration

The Civil Registry is responsible for handling applications for marriages, approving marriage registrations, hosting ceremonies for the signing of marriage certificates and registering marriages. A total of 3,187 marriages were registered during 2024.

Death Registration

Family dependents or other relatives of a deceased person may register his or her death with the Civil Registry. There were 2,574 deaths registered during 2024.

Divorce by Mutual Consent

The Civil Registry has the authority to process divorce by mutual consent. Applicants who have been married for over one year, have no children aged under 18, and have reached agreement on maintenance payments and ownership of their residences may submit applications to the Civil Registry. There were 594 divorce applications during 2024.



↑ 澳門 Macau
及 港珠澳大橋
Ponte Hong Kong-Zuhai-Macau

Macao Bridge



Macao Bridge is a major transport infrastructure adjacent to the Hong Kong-Zhuhai-Macao Bridge. It starts from the eastern side of New Urban Reclamation Zone Area A in Macao, connects to the artificial island of the Hong Kong-Zhuhai-Macao Bridge Port, crosses the Outer Harbour Channel and the Macao Channel, and extends to New Urban Reclamation Zone Area E1, with a reserved elevated connection to the Taipa Grande Tunnel. The total length of Macao Bridge is approximately 3.1 kilometres, with the sea-crossing section measuring about 2.9 kilometres. The bridge not only optimises Macao's overall transport network, but also provides more convenient commuting for residents and visitors, further supporting Macao's development as a world centre of tourism and leisure, and contributing to the continuous improvement of people's wellbeing and appropriate economic diversification. The completion ceremony was held on 1 October, and a march to commemorate the inauguration of Macao Bridge was held on 29 September prior to the bridge's commencement of operation, attracting around 21,000 participants to enjoy the lively atmosphere.

