CFE-DM

MALAYSIA

Disaster Management Reference Handbook

December 2025



CENTER FOR EXCELLENCE IN DISASTER MANAGEMENT & HUMANITARIAN ASSISTANCE
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Acknowledgements

CFE-DM would like to thank the following people for their knowledge and support in developing this resource:

Aamir Riaz, Programme Officer; Karen Woo, Senior Coordinator on Early Warning Systems; and Amila Amunugama, Consultant, International Telecommunications Union (ITU);

Chinatsu Endo, Programme Management Officer, United Nations Office for Disaster Risk Reduction, Regional Office for Asia and the Pacific;

Jochen Luther, Technical Coordinator, World Meteorological Organization (WMO) Regional Office for Asia and the South-West Pacific;

Malaysian Red Crescent, and Ganesh Navaratnam, Humanitarian Crisis Analysis Team Leader/Coordinator, Health, Disaster, Climate, and Crisis Unit, Asia-Pacific Regional Office, International Federation of Red Cross and Red Crescent Societies;

Mohd "Min" Muhaimin Ridwan Wong, Senior Research Officer, and Noor Diyana binti Fazan Ahmad, Social Research Officer, Humanitarian Assistance and Disaster Relief Research Centre, National Defence University of Malaysia;

Nidhirat Srisirirojanakorn, Associate Humanitarian Affairs Officer, United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Regional Office for Asia and the Pacific (ROAP)

Front Cover

Batu Cave in Gombak, Selangor, Malaysia during Deepavali in October 2025. Photo credit: Stephanie Liu

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Other references may cite this publication using the following format:
CFE-DM. Title. Year. Date Accessed. URL

Published: December 1, 2025 (20251201v4.0)

ISBN 978-1-955429-70-2

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Letter from the Director

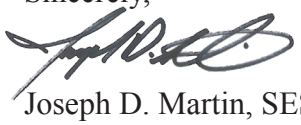
Malaysia's practice of proactive, holistic disaster management (DM) is delivering results in the country, regionally, and globally. Malaysia has increased coordination throughout the disaster management system and incorporated disaster risk reduction, particularly after large-scale flooding in December 2014. The 2015 establishment of the country's National Disaster Management Agency (NADMA) led to a decade of strategic and practical shifts. Through this work, Malaysia has cemented its commitment to disaster management aspects of the Association of Southeast Asian Nations (ASEAN), which is leading the way for how a regional organization can play a significant role in disaster management. Malaysia is also contributing beyond the region with disaster response efforts, including sending search and rescue teams to Türkiye and Myanmar after earthquakes in those countries.

The United States (U.S.) and Malaysia share a diverse partnership across numerous sectors. Security cooperation activities encompass frequent participation in exercises, including Bersama Warrior, Pacific Angel, and Pacific Partnership. The two countries exchange expertise and lessons learned in numerous areas including humanitarian assistance and disaster relief and work to build interoperability across skillsets that may support large-scale international disaster responses. The Washington National Guard, through the National Guard Bureau's State Partnership Program, also helps maintain close connections with Malaysian Armed Forces during annual engagements, which often include components of disaster response training.

The Center for Excellence in Disaster Management and Humanitarian Assistance (CFE-DM) also contributes to engagements with Malaysia. In April 2025, CFE-DM collaborated with NADMA to conduct a civil-military coordination course development workshop with Malaysian interagency and civil society participants. In September 2025, in collaboration with NADMA, CFE-DM conducted a Civil-Military Coordination in Humanitarian Logistics Management workshop for Malaysian interagency participants.

CFE-DM is pleased to offer this handbook, which provides an overview of Malaysia's approach to disaster risk and response management, including the roles of key responders and DM partners. This publication is intended to serve as a source of information for individuals preparing for immediate deployment or disaster-related trainings and engagements alongside Malaysian partner responders.

Sincerely,



Joseph D. Martin, SES
Director

About the Center for Excellence in Disaster Management & Humanitarian Assistance

Overview

The Center for Excellence in Disaster Management & Humanitarian Assistance (CFE-DM) is a United States (U.S.) Department of Defense (DoD) organization comprised of nearly 30 subject matter experts that provide academic research, civil-military coordination training, and operational insights to support decision making before, during, and after crises. The Center is designed to bridge understanding between humanitarians, civilian, and military responders. CFE-DM partners with a diverse group of governmental and nongovernmental actors, as well as academic institutions to increase collaborations and capabilities in humanitarian assistance and disaster response. While maintaining a global mandate, the Indo-Pacific region is our priority of effort and collaboration is the cornerstone of our operational practice. The Center is a direct reporting unit to U.S. Indo-Pacific Command (USINDOPACOM) and is located on Ford Island, Joint Base Pearl Harbor-Hickam, Hawaii.

Vision

Resilient Joint Forces, Allies, and Partners that are fully prepared to respond across the spectrum of humanitarian crises.

Mission

CFE-DM builds crisis response capacity in US, Allies and Partner militaries across the Indo-Pacific to save lives before, during, and after emergencies.

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EXECUTIVE SUMMARY

Familiarity with a country's hazard exposure, vulnerabilities, and coping capacities can support effective disaster response operations. This updated Malaysia Disaster Management Reference Handbook provides information for planners and operators have a baseline of knowledge to support disaster management (DM) engagement with Malaysian stakeholders.

Hazards and Communities

Malaysia sits astride the South China Sea with Peninsular Malaysia on the western side and East Malaysia (on Borneo) on the eastern side. The country is home to some 34.2 million people, many of whom reside in dense urban corridors on the Peninsula's west coast.

The country's terrain, hydrology, and climate are factors in disaster risk. Both Peninsular and East Malaysia are home to myriad river systems and steep terrain. The humid, tropical climate, dominated by two monsoon seasons, is marked by regular periods of heavy rainfall. This combination intersects with socioeconomic factors and settlement patterns. Nearly annual flood events have major impacts on people and livelihoods. Historic floods have damaged properties and disrupted business and transport and have been especially damaging for urban households located in floodplains.

Other hazard events occur less often but can be severe. Steep natural and man-made slopes and upland areas are vulnerable to landslides when heavy rains strike, and these slides can block roads and isolate communities. Droughts correlate with El Niño phases and lead to disruptions of food systems and industrial sectors reliant on water – utilities, manufacturing, etc. Dengue outbreaks occur almost annually, with seasonal peaks and concentrations in urban and peri-urban corridors on the west coast of Peninsular Malaysia. Finally, wildfires and haze events are episodic. Although destructive earthquakes within Malaysia are rare, the country is vulnerable to tsunami impacts triggered by regional seismic events.

While most years see few human deaths and injuries, major events highlight the country's exposure to both recurrent hydrometeorological hazards and infrequent but high-impact geophysical shocks. The 2004 Indian Ocean tsunami struck Peninsular Malaysia's northwest coast, where it killed 68 people and damaged infrastructure and livelihoods.

Building a Shared Response

For 30 years, Malaysia's government has been moving toward a holistic DM strategy. In line with global frameworks, it is integrating disaster risk reduction (DRR) to ensure that government, non-government organizations (NGO), the private sector, and communities are aware of hazards, adaptation opportunities, and response options before, during, and after emergencies.

Since 2014, the National Disaster Management Agency (NADMA) has been the focal point for all national DM activities, and it received a bolstered mandate in 2024 to ensure integration of DRR into DM. NADMA leads coordination, while state and district Disaster Management Committees deliver local DRR programs and execute response operations. NADMA and local authorities adhere to the cluster approach to disaster response, and the country has proactively designated ministries and agencies to lead clusters alongside international humanitarians.

A key player in NADMA's work is the Special Malaysia Disaster Assistance and Rescue Team (SMART), which conducts domestic and international responses that require technical skills, especially in search and rescue (SAR). SMART has participated in numerous international missions, including in India, Indonesia, Myanmar, Nepal, Pakistan, Philippines, Türkiye, and Ukraine. NADMA is also active in the international arena, particularly in DM and DRR initiatives with other member-states of the Association of Southeast Asian Nations (ASEAN) and with United Nations (UN) agencies and bodies.

COUNTRY OVERVIEW

Malaysia's disaster risk is shaped by its geography, terrain, and climate. The Northeast Monsoon (November–March) drives nationwide flood risk across 189 river basins, while upland regions face heightened danger from rain-triggered landslides. Although Malaysia lies outside the main cyclone belt and away from major faults, it is still exposed to tsunamis generated by regional quakes. Moreover, episodic drought and haze can stress water supply and health systems. Urbanization along the west coast – especially Greater Kuala Lumpur – amplifies consequences when floods strike densely populated, low-lying districts, and social vulnerabilities intersect with these hazards. A centralized federal system aids national coordination, but uneven local capacity remains a constraint.

Geography and Environment

The interplay of terrain, hydrology, and climate significantly shapes disaster risk and operational access in Malaysia. Low-lying river basins are susceptible to flooding, and some areas recurrently experience seasonal floods. Meanwhile, steep natural and man-made slopes and upland areas – especially in Peninsular Malaysia's highlands and Sabah's mountainous interior – are vulnerable to landslides after heavy rains.

Malaysia covers approximately 330,800 square kilometers (km^2; 127,723 square miles [mi^2]) of land, divided into two geographically distinct regions – Peninsular or West Malaysia and East Malaysia (Sabah and Sarawak on Borneo) – separated by the South China Sea.[1] Peninsular Malaysia features the Titiwangsa Mountains, which run north–south through the center of the peninsula and are heavily forested.[2] In comparison, East Malaysia transitions from swampy coastal lowlands to the dry, hilly interior and then to the mountainous Crocker Range, the latter containing Mount Kinabalu, the country's highest peak at 4,095 meters (m; 13,435 feet [ft]).[3] Figure 1 shows a map of Malaysia, created using ArcGIS Online.[4]

Malaysia's landscape is interlaced with a dense system of 189 river basins; 89 of the river basins are in Peninsular Malaysia, 78 in Sabah, and 22 in Sarawak.[5] There are many long, meandering systems that provide water supply, transport, irrigation, and hydropower. Rivers are vital for biodiversity and livelihoods but also pose challenges from seasonal flooding, sedimentation, and pollution.[6]

Malaysia sits within a tropical monsoon climate zone. The Northeast Monsoon (November–March) brings intense rainfall to the east coast of Peninsular Malaysia and parts of East Malaysia. The Southwest Monsoon (May–September) is comparatively drier but may still deliver substantial rainfall in localized areas, including western Sabah. Average annual precipitation hovers around 2,500 millimeters (mm; 98 inches [in]), with mountainous areas receiving up to 5,000 mm (197 in) of precipitation annually. Temperatures are typically warm, ranging 27–32°C (80.6 – 89.6°F) in lowland areas.[7]

Society and Demographics

Malaysia is a multi-ethnic society composed chiefly of the Bumiputera, who constitute some 70% of citizens. This category includes the ethnic Malay majority and indigenous groups – the Orang Asli in Peninsular Malaysia and the native peoples of Sabah and Sarawak. The remainder of the population is comprised primarily of ethnic Chinese (about 23%) and Indian (about 7%) minorities, according to the 2020 Population and Housing Census.[8]

Including non-citizens (mostly foreign workers), the total population was about 34.2 million in 2025.[9] The population has a slight male majority (approximately 111 males per 100 females) due to an overrepresentation of males among foreign workers.[10]

Malaysia's demographic growth has slowed significantly in the last 40 years, from 3.3% annual growth in 1980.[11] While 2023's growth



Figure 1: Map of Malaysia

(around 1.9%) was already lower than earlier years, the annual growth in 2024 fell sharply to 0.5%.[12] Fertility rates have fallen below replacement level. Whereas the country recorded a fertility rate of 5 births per woman in 1970, it recorded only 1.6 births per woman in 2022, the lowest rate in five decades.[13] Consequently, Malaysia is undergoing a steady aging trend. The share of the population aged 65 years and older rose to 8.1% in 2024 and is projected to reach 14–17% by 2040. Within two decades, the country is expected to qualify as an "aged" society.[14]

Life expectancy has increased in parallel with falling fertility. As of 2024, Malaysia's Department of Statistics reported a life expectancy at birth of 75.2 years (77.8 for females, 73.0 for males).[15] These trends reflect improving health but foreshadow greater needs for elder care and social support as the population ages.

Malaysia's population is unevenly distributed, with a high concentration in peninsular urban corridors. The overall population density is estimated at 110 people per km^2 (42.47 people per mi^2),[16] but this number masks great variation; the rural interior of Malaysian Borneo (Sabah and Sarawak) is sparsely populated, whereas the west coast of Peninsular Malaysia is densely settled.[17]

The proportion of Malaysians living in urban areas has risen markedly in recent decades and has reached nearly 80%.[18] The Klang Valley / Greater Kuala Lumpur metro area – encompassing the capital and surrounding cities in Selangor state – dominates the urban landscape. Greater Kuala Lumpur, by far the largest urban agglomeration, has an estimated 8-9 million people in its conurbation.[19] The next largest city regions are an order of magnitude smaller. Johor Bahru, the southern industrial hub opposite Singapore, has 1-2 million people,[20] and the George Town metro area in Penang (including Butterworth on the mainland) houses 1.5-3 million people.[21] Other state capitals and regional centers – e.g., Ipoh in Perak, Kota Kinabalu in Sabah, and Kuching in Sarawak – range from a few hundred thousand to just under 1 million inhabitants.[22]

The greater Selangor/Kuala Lumpur area

alone accounts for over one-fifth of the national population.[23] By contrast, entire states like Perlis or Labuan hold well under 1% each. This urban concentration brings both advantages and vulnerabilities. On one hand, urban infrastructure and services reach the majority of people; on the other hand, many major settlements lie on low-lying coasts or flood plains, a location that exposes large populations to natural hazards. Photo 1 depicts Kuala Lumpur's city center, with the Petronas Twin Towers in the center.[24]

Vulnerable Groups

The impact of hazard events on individuals and coping strategies people employ depend heavily on socio-economic status, cultural norms, and access to resources, among other factors. Specific risk reduction measures – especially including vulnerable people in hazard awareness campaigns and in planning for disasters – can help reduce vulnerability and build societal resilience.

Children - As of the first quarter of 2025, the proportion of Malaysia's population comprising children aged 0–14 years of age was 22.2%.[25] Children are especially vulnerable during disasters. They cannot independently access critical information or resources and must rely on adults for evacuation and care. Children from poor or rural families face compounded risks; malnutrition and stunting have been rising among low-income Malaysian children in non-crisis times, and a disaster can further deprive them of food security and medical attention.[26] Additionally, Malaysia hosts a significant number of refugee and asylum-seeker children (nearly 60,000 people below 18 years of age are registered with the UN High Commission on Refugees [UNHCR]).[27] These children, many of whom are from Myanmar's Rohingya community, often lack access to formal education and live in precarious conditions. In an emergency, unaccompanied or separated children – especially those already marginalized – are at heightened risk of exploitation or abuse, a risk that underscores the importance of child protection measures in disaster response.[28]

Elderly – Malaysia's population is aging; as of 2024, 11.6% of Malaysians (approximately



Photo 1: Kuala Lumpur's City Center

3.9 million people) were aged 60 years and above, and 8.1% were 65 years of age or older.[29] Many older Malaysians live with chronic health conditions or reduced mobility that can impede response to warnings or evacuation orders. While most elders co-reside with family, a non-trivial share of seniors live alone. The 2018 National Health and Morbidity Survey (NHMS) found 6.3% of those aged 60 years and older lived alone, and this situation can heighten isolation during emergencies.[30] Older adults also face a digital divide; uptake and use of internet and online services are markedly lower among those age 60 years and older compared with younger groups, and this lack of digitization can reduce access to official advisories.[31] Research on Orang Asli communities documents low disaster preparedness and barriers to early readiness among indigenous older persons.[32] Targeted measures like assisted evacuation, continuity of medications, accessible/low-tech alerts, and caregiver support in shelters are critical for this cohort.

Foreign Workers – Malaysia hosts a large population of foreign workers, drawn by jobs in construction, plantation agriculture, manufacturing, domestic work, and services. By mid-2023, there were roughly 3 million resident non-citizens – about 8.9% of the population – the vast majority of whom were labor migrants from Indonesia, Bangladesh, Nepal, and Myanmar.[33] A significant number of these workers have irregular or undocumented status, although government amnesty programs have recently legalized hundreds of thousands.[34] As a group, foreign workers are socially and economically vulnerable; in formal settings, they might receive some safety training or inclusion in workplace emergency drills, but undocumented workers and those living at worksites or crowded dormitories may have little access to disaster preparedness information. Language barriers and fear of authorities can prevent them from seeking help or shelter during an emergency. Moreover, migrants typically lack social support networks in Malaysia; their ability to access post-disaster assistance often hinges on their employers or community groups.[35] After a major disaster, many migrant workers could lose their livelihoods and housing, and some may return to their home countries (voluntarily or via repatriation) if industries shut down. Ensuring that this population is accounted for in DM plans (with multilingual warnings, inclusive relief policies, etc.) remains an important challenge for Malaysian authorities.

People Living in Poverty – Malaysia has reduced overall poverty rates, but vulnerable pockets remain, particularly in urban low-income settlements and rural indigenous communities. In 2022, about 6.2% of households lived below the national poverty line, though 16–17% lived in "relative poverty" (below 50% of median income).[36] These families often lack savings, insurance, or secure housing; a single flood, fire, or drought can push them into deeper hardship. Urban poor households are concentrated in informal settlements, which are often hazard-prone areas, such as floodplains in Kuala Lumpur, while rural poverty is most acute among indigenous peoples in Sabah and Sarawak and in some Malay villages in peninsular states. Disasters can wipe out subsistence livelihoods, prolong displacement, and entrench inequality. Many in the "B40" low-income group (refers to the bottom 40% of households by income) hover just above the poverty line and risk falling back into poverty when shocks occur.[37]

People Living with Disabilities – People living with disabilities ("Orang Kurang Upaya," OKU) in Malaysia are a significant but often overlooked vulnerable group. As of March 2025, about 767,000 OKU (roughly 2% of the population) were officially registered with the Department of Social Welfare. However, survey data from the 2019 NHMS indicate that disability prevalence is much higher, with approximately 11% of adults and 4.7% of children (aged 2-17 years) experiencing functional difficulties.[38] Most OKU are unregistered and socially marginalized, and

fewer than 1% were employed in 2018. Disaster risks for OKU are heightened due to Malaysia's urban infrastructure gaps; high-rise apartments and public transit are often inaccessible, and emergency alerts may not reach those with hearing or vision impairments.[39] During the 2021 floods, many wheelchair-bound or bedridden residents required direct rescue.[40] Evacuation centers frequently lack accessible facilities such as suitable toilets, sleeping arrangements, or adequate basic services, and they are, therefore, difficult for OKU to use during disasters. Including OKU in Malaysian disaster planning and providing accessible shelters, targeted evacuation support, and replacement of lost assistive devices are critical steps to ensuring this group is not left behind.[41]

Refugees and Asylum-Seekers – Malaysia hosts about 200,260 refugees and asylum-seekers registered with UNHCR as of May 2025. The majority (approximately 179,000) of these people are from Myanmar, including approximately 117,000 Rohingya.[42] Malaysia is not a signatory to the 1951 Refugee Convention and does not legally recognize refugee status. Therefore, no formal refugee camps are permitted, and refugees are dispersed in urban low-rent apartments and informal settlements around Kuala Lumpur, Penang, Johor, and other cities. Moreover, refugees cannot work legally, attend public schools, or access most public health care. Families are reliant on informal jobs, charity, and humanitarian aid, and they often are trapped in poverty.[43] Their vulnerabilities are magnified in crises. Refugees often miss official communications due to language barriers or fear of authorities, and they may be excluded from government aid channels.[44] During lockdowns at the height of the Coronavirus Disease 2019 (COVID-19) pandemic, many refugees were unable to obtain food or cash relief without NGO support, and this gap underscores systemic exclusion.[45] While UNHCR and local NGOs help fill gaps through community outreach, shelter, and relief, coverage is limited.

Women – Women in Malaysia have legal equality under the law, but entrenched social norms and economic structures create distinct vulnerabilities, especially during disasters. Women often have primary caregiving responsibilities for the sick, elderly, and children; these duties may limit their time and flexibility to respond to crisis. Malaysia's working women experience a "double burden" as they spend significantly more time on unpaid care work than Malaysian men do. A complicating factor is that many women work in informal or low-wage sectors with limited social protection, and their susceptibility to income loss during disasters or pandemics is higher.[46] Disasters can further intensify risks of gender-based violence, while cultural norms in some communities restrict women's access to life-saving skills or their freedom to evacuate.[47] Despite these challenges, women are central to household and community resilience. Effective disaster response requires safe relief centers, targeted support for women-headed households, and active inclusion of women in planning and decision-making. Malaysian women's organizations have long advocated for gender-responsive DM and recognizing that empowering women strengthens recovery outcomes for entire communities.[48]

Government

The Malaysian government is a constitutional monarchy. It operates on a parliamentary, federal system. The administrative framework is often described as a form of centralized parliamentary federalism, as states ceded significant powers such as finance, defense, and foreign affairs to the federal government but retained constitutionally protected authority in certain areas, including Islamic law, land, and local governance.[49]

At the federal level, the head of state is the Yang di-Pertuan Agong, who is elected to a 5-year term by and from among the nine hereditary rulers of Peninsular Malaysia. This rotation follows an established order agreed upon by the Conference of Rulers rather than strict seniority. While the Yang di-Pertuan Agong acts largely on the advice of the Prime

Minister and Cabinet, the Constitution grants limited discretionary powers in key situations, such as appointing a Prime Minister when no party commands a majority or withholding consent for the dissolution of Parliament.[50] The head of government is the Prime Minister.[51]

Of Malaysia's 13 states and 3 Federal Territories, 11 states and 2 territories are in Peninsular Malaysia, while Sabah, Sarawak, and the Federal Territory of Labuan are in East Malaysia. Of the 13 states, 9 are hereditary monarchies, 7 are ruled by Sultans, 1 (Negeri Sembilan) is led by a Yang di-Pertuan Besar elected from eligible princely families, and 1 (Perlis) has a Raja. The remaining states (Penang, Melaka, Sabah, and Sarawak) are headed by Yang di-Pertua Negeri (Governors), who are appointed by the Yang di-Pertuan Agong for renewable 4-year terms on the advice of each state's Chief Minister.[52]

Below the federal and state levels, Malaysia's administrative divisions include districts (daerah/jajahan) and sub-districts (mukim). Local government is carried out by local authorities (Pihak Berkuasa Tempatan), but they have limited autonomy. Local elections were suspended in 1965 under emergency regulations and effectively abolished by Section 15(1) of the Local Government Act 1976; councilors are now appointed by state governments.[53]

A key constitutional provision, Article 150, empowers Malaysia's federal government to assume state powers during a declared emergency – for example, through the Emergency (Essential Powers) Act 1979.[54] Disaster governance also reflects the federalized structure - i.e., federal institutions lead coordination, while state and district committees operate under federal direction. The framework is guided by NADMA Directive No. 1,[55] which obliges state and district Disaster Management Committees to conduct integrated disaster drills and seasonal preparedness activities, a shift from a security-driven model to a more comprehensive DM system aligned with the ASEAN Agreement on Disaster Management and Emergency Response (AADMER) and the Sendai Framework.[56]

Economic Profile

Malaysia is an upper-middle-income, highly open economy that is expected to move to high-income status in or shortly after 2028.[57] The central bank, Bank Negara Malaysia (BNM), revised its growth outlook for 2025 to 4.0–4.8%, after a 5.9% nominal expansion in gross domestic product (GDP) in 2024 and real growth of 4.4% year-on-year in the first quarter of 2025. Momentum is led by domestic demand, but the country is also exposed to global trade and tariff risks, all of which shape fiscal space and near-term resilience. Because BNM is trusted and growth is steady, Malaysia can stabilize the economy and bounce back after shocks. Nonetheless, the economy is very trade-dependent, and weak global demand or new tariffs abroad still spill over quickly at home.[58]

Services are Malaysia's dominant economic pillar, contributing 60% of GDP, followed by manufacturing. This composition underpins employment and fiscal revenue while bolstering resilience, as diversified urban services and industry provide strong rebound capacity. However, operational continuity is heavily dependent on infrastructure resilience because spatial clustering of industry and services in major corridors heightens logistics and flood risks. These concentrations leave urban and industrial hubs especially vulnerable to floods and supply-chain shocks. Meanwhile, with exports accounting for some 70% of GDP, high trade dependence supports rapid recovery when global demand strengthens but also magnifies exposure to external downturns.[59]

Unemployment stood at around 3.3% in mid-2024 and edged lower to 3.0% by May 2025. Low unemployment strengthens household resilience and near-term response capacity via income security. However, the concentration of jobs in services and manufacturing, with agriculture a small share, implies that rural, weather-sensitive livelihoods can be disproportionately affected by shocks, requiring targeted safety nets.[60]

DISASTER PROFILE

Malaysia is exposed to a wide range of hazards, with flooding by far the most frequently occurring and the most damaging. Flooding occurs almost annually, particularly during the Northeast Monsoon, and it has nationwide impacts. The December 2021 floods caused an estimated MYR 6.1 billion (US$1.46 billion) in losses and displaced tens of thousands of people. Other hazards occur less often but can be severe. They include landslides and debris flows in hilly terrain, droughts intensified by El Niño, epidemic diseases such as dengue, and episodic wildfires and haze. Malaysia also faces low to moderate risk from earthquakes and tsunamis, with the 2004 Indian Ocean tsunami killing at least 68 people on Malaysia's northwest coast.[61] While most years see relatively few human losses, major events highlight the country's exposure to both recurrent hydrometeorological hazards and infrequent but high-impact geophysical shocks.

Hazards

Geographic areas of Malaysia have varying levels of exposure to natural and anthropogenic hazards. The threat level associated with landslides, tropical storms, and tsunamis is higher in concentrated areas, whereas the likelihood of impacts from drought, epidemic disease, and flooding is more widely distributed.

Droughts

Droughts in Malaysia occur with moderate frequency, especially in years influenced by El Niño, and they are expected to intensify under warming ocean scenarios. A 2021 analysis of approximately 40 years of streamflow data across Peninsular Malaysia found that about 24% of the land area is under hydrological drought stress in typical years, while during severe events such as droughts in 1997-1999, 2002, and 2016-2018, more than 48% of the peninsula experienced hydrological drought.[62] The same study reported relatively higher drought severity and frequency in the northeast and southeast regions of Peninsular Malaysia. In East Malaysia (Sabah and Sarawak), droughts occur intermittently but also tend to become severe during periods of low rainfall associated with El Niño and monsoon variability; recent studies show that these events disproportionately affect the central and eastern regions of both states.[63]

Earthquakes

Malaysia experiences low to moderate seismic hazard, with higher activity localized in Sabah (East Malaysia), while Peninsular Malaysia is generally less active but not free of risk. Empirical data from Sabah for the years between 2002 and 2020 confirm recurrent earthquakes of varying magnitude, including the 2015 Moment Magnitude Scale (Mw) 6.0 Ranau earthquake, which caused landslides and 18 fatalities on Mount Kinabalu.[64] Several fault zones in Sabah, such as those in the Crocker Range, are recognized as seismically active.[65] In contrast, seismicity in Peninsular Malaysia is mainly associated with distant subduction activity in Sumatra, reactivation of ancient fault structures, or intraplate events of modest magnitude ($Mw \leq 5$).[66] Although destructive earthquakes within Malaysia are rare, the country is vulnerable to impacts by tsunamis triggered by regional seismic events. Modeling and hazard assessments show that regional tsunamigenic sources in the Andaman-Indian Ocean and Manila-South China Sea regions pose a real threat to Malaysia's coastal zones.[67]

Epidemic Diseases

Malaysia's foremost epidemic hazard is dengue, which recurs seasonally and peaks in multi-year waves that are concentrated in urban and peri-urban corridors on the west coast of Peninsular Malaysia (i.e., Selangor, Kuala Lumpur/Putrajaya, Penang, and parts of Johor). Outbreaks typically coincide with the rainy season, when mosquito breeding sites are more abundant. The World Health

Organization (WHO) regional situation updates for 2025 assess a high dengue burden across the Western Pacific, and Malaysia's iDengue system routinely maps clusters in the named conurbations.[68]

Zoonotic malaria now dominates Malaysia's malaria risk. The country has recorded zero indigenous human-only malaria cases since 2018. Meanwhile, Plasmodium knowlesi persists in forest-fringe areas of Sabah and Sarawak, and cases rose from 2,505 in 2022 to 2,879 in 2023.[69]

Beyond arboviruses and malaria, tuberculosis imposes steady pressure on services; a 2025 review reported an incidence of about 97-113 cases per 100,000 people in 2021–2022, with higher rates in Sabah, Labuan, and Kuala Lumpur.[70] Hand, foot, and mouth disease (HFMD) remains common, with a recent national analysis showing higher incidence in East Malaysia than Peninsular Malaysia in most years and a rising trend in peninsular districts.[71] Flood seasons elevate leptospirosis and other water- and shelter-related infections, a trend that reinforces the importance of water, sanitation, and hygiene (WASH) measures at evacuation centers.[72] Japanese encephalitis continues to warrant surveillance in Sarawak, where it remains a noted contributor to viral encephalitis.[73]

Extreme Temperatures

Malaysia's climate is equatorial; temperatures are relatively uniform year-round, with high humidity and copious rainfall.[74] However, observational studies confirm that the frequency, duration, and geographic extent of heatwaves in Peninsular Malaysia have increased in recent decades. For example, a recent spatiotemporal analysis reports that heatwaves (defined by high daytime and/or nighttime temperatures exceeding high percentile thresholds for ≥ 3 days in a row) occur more often now than in earlier decades and that the land area affected by such heatwaves has been increasing. Urban centers such as Kuala Lumpur are particularly vulnerable due to dense development and poor ventilation, both of which amplify heat stress through the urban heat island effect.[75]

The impacts of extreme heat in Malaysia are multifaceted. Health risks include heatstroke, dehydration, and exacerbation of chronic conditions, especially among children, the elderly, and outdoor workers.[76] Education and economic activities have also been disrupted, with school closures and reduced outdoor labor productivity during peak events.[77] Agriculture faces yield stress under prolonged heat, while marine ecosystems suffer coral bleaching and reduced fisheries productivity due to elevated sea surface temperatures.[78] Projections indicate average temperatures may rise by 1-3°C (about 2-5°F) by the end of the century depending on emissions pathways, and this rise would increase both the likelihood and severity of extreme heat events.[79]

Floods

Flooding is Malaysia's most frequent hazard event; it accounts for about 85% of recorded disasters since 2000.[80] Risk peaks during the Northeast Monsoon (November–March), which routinely brings riverine flooding to east coast peninsular states – Kelantan, Terengganu, Pahang, and Johor; urban areas such as the Klang Valley also face damaging flash floods, and flood events also occur in East Malaysia.[81] Flood impacts are recurrent and sometimes severe. The December 2021 floods caused billions of Malaysian ringgit in losses and highlighted the possible scale of displacement and disruption across Selangor, Kuala Lumpur, and other states.[82] More recent monsoon seasons, including late 2024, again forced mass evacuations across multiple states.[83]

Landslides

Landslides and debris flows are a recurring hazard in upland and hilly terrain, where they are driven by heavy rainfall, deforestation, road cuttings, and poorly managed slope development. The Highland Towers collapse in Selangor in 1993 and the Bukit Antarabangsa landslide in 2008, also in Selangor, both underscored how saturated soils, drainage failures, and structural weaknesses can combine

to trigger major slope failures and widespread displacement.[84] While such events are localized, their consequences are often severe and include fatalities, the destruction of homes, blocked transport corridors, and disruption of critical infrastructure. Hotspots include the Cameron Highlands, Genting Highlands, Fraser's Hill, Sabah's Crocker Range, and hill suburbs around Kuala Lumpur. As urbanization continues to encroach on steep terrain and extreme rainfall events increase under climate change, landslide and debris-flow risks are expected to rise unless slope engineering, drainage maintenance, and land-use planning are rigorously enforced.[85] Figure 2 depicts the landslide hazard risk across Peninsular Malaysia, as published in the UN Office for Disaster Risk Reduction (UNDRR) 2020 Risk Status Report.[86]

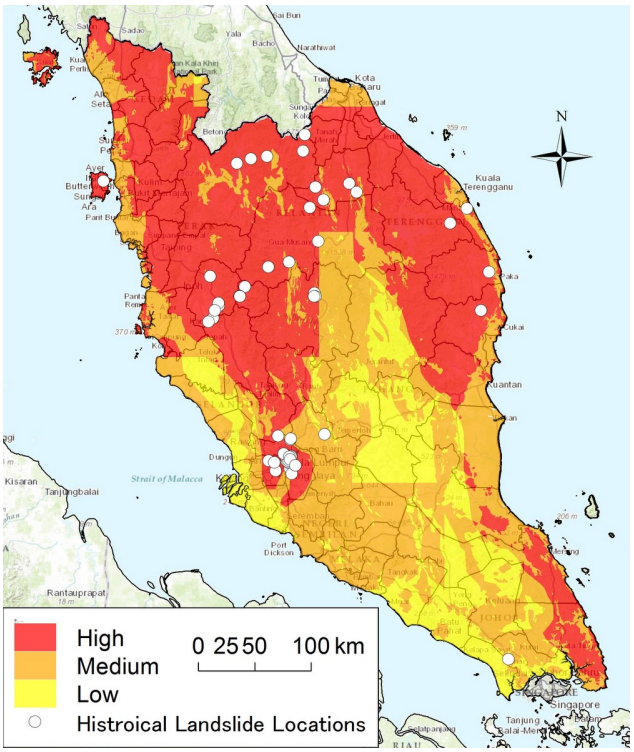


Figure 2: Landslide Risk Map of Peninsular Malaysia

Tropical Cyclones and Storms

Malaysia is not directly in the main path of tropical cyclones, but it is affected indirectly. The country lies between 1°N and 7°N.[87] Tropical cyclones rarely form or maintain strength within about 5° of the equator, because the Coriolis force there is too weak to sustain rotation.[88] As a result, Malaysia almost never experiences direct landfall by typhoons or cyclones. Malaysia's main hazards are the secondary impacts of tropical cyclones: torrential rain, flooding, and storm surges, particularly on the east coast of Peninsular Malaysia and coastal Sabah and Sarawak.[89]

Tsunamis

Malaysia faces a low to moderate tsunami risk, largely stemming from its exposure to the Indian Ocean and nearby submarine earthquake zones. The northern and western coasts of Peninsular Malaysia (notably Penang, Kedah, and Langkawi) were struck by the 2004 Indian Ocean tsunami, which caused wave run-ups of 2-3 m (6.5–9.8 ft) and local run-ups of 6-8 m (19.7–26.3 ft) in more exposed spots. The waves damaged fishing villages and displaced coastal residents.[90] The government recorded 68 deaths, including 54 in Penang, and many injuries.[91] While major tsunamis are rare, future risk assessments identify plausible sources in the Indian/Burma Plate, Andaman Islands, Sunda Trench, Sulu Trench, Sulawesi Trench, and other regional fault or trench zones that could generate waves impacting Malaysia's coasts.[92]

Wildfires and Haze

Wildfire risk in Malaysia is dominated by peatland and forest fires, especially during dry seasons and El Niño events. Areas with drained peat soils, such as peat swamps in Selangor (Raja Musa Forest Reserve), Sarawak, Johor, and Perak, are particularly susceptible to ignition. Studies using various models show increasing fire risk in peatlands under all climate scenarios. Projections for peat fire susceptibility in Sarawak suggest rising risk, though with high uncertainty.[93] The impacts of peat and forest fires extend well beyond burnt areas. These fires drive regional haze and air pollution, degrading air quality, harming health, and reducing visibility with knock-on effects for transport and tourism. Peatland fires also release significant greenhouse gases, and they damage biodiversity, soil integrity, and hydrology.[94]

Disasters by Numbers

The following assessment of data is intended to support planning for potential disaster responses by characterizing the most common hazard types, their seasonal clustering, geographic distribution, and any observable trends in frequency or severity.

The Centre for Research on Epidemiology of Disasters (CRED) maintains an international disaster database (EM-DAT) that classifies disasters as events resulting in 10 or more deaths, affecting 100 or more people, or triggering a declared state of emergency.[95] Using this dataset, 107 disasters were recorded in Malaysia between 2000 and July 2025.[96] Of the 107 disasters recorded, 81 were linked to natural hazards – biological, climatological, extra-terrestrial, geophysical, hydrological, and meteorological. The remaining 26 events were anthropogenic or technological incidents, of which 22 were transport accidents (14 water, 4 road, 3 air, and 1 rail) and 4 were other accidents (2 industrial, 1 school fire, and 1 miscellaneous).

While EM-DAT provides consistency with international practice for tracking disasters across time and countries, the data should be interpreted with caution. Reporting biases are inherent in aggregated datasets, particularly across hazard types. For instance, biological hazards (e.g., epidemics) and extreme temperature events (e.g., heatwaves) are often underreported or of lower quality. EM-DAT also excludes certain categories, such as communal violence and major transnational events (e.g., the COVID-19 pandemic). Moreover, some events may be missing due to incomplete reporting from Malaysia and its DM partners. For further details, see EM-DAT's documentation on known limitations: *https://doc.emdat.be/docs/known-issues-and-limitations/specific-biases/#accounting-biases*.

Despite these limitations, EM-DAT was chosen for this assessment because its methodology aligns with international standards, and because the types of events it includes are the most likely to generate large-scale loss of life, significant disruption, and potential requests for international assistance – including foreign military support.

Among natural hazard events, hydrological disasters dominated, with 68 incidents in total – 65 floods and 3 landslides. Geophysical hazards accounted for two events (one earthquake and one tsunami), while climatological hazards also numbered two (one wildfire and one drought). Biological hazards contributed to four events, comprising three viral epidemics (one HFMD outbreak and two dengue fever outbreaks) and one other infectious disease. Finally, five meteorological events were recorded, all storms. Figure 3 illustrates the distribution of natural hazard types recorded in Malaysia over the past 25 years, according to EM-DAT.[97]

Figure 4 provides the incidence of various hazard events from 2000 to 2025, and highlights the increased frequency of flood events from 2019 to 2023 compared to previous years. Other hazard types show relatively stable frequencies, though single large-scale events – such as the 2004 tsunami or major dengue outbreaks in 2007 and 2023 – stand out as significant outliers.

The deadliest single event recorded during the 25-year period was the 2014 crash of a Boeing 777-200, which killed 239 people. The second was a 2023 dengue outbreak that caused 100 deaths, and the third was the 2004 Indian Ocean tsunami, with at least 68 deaths.

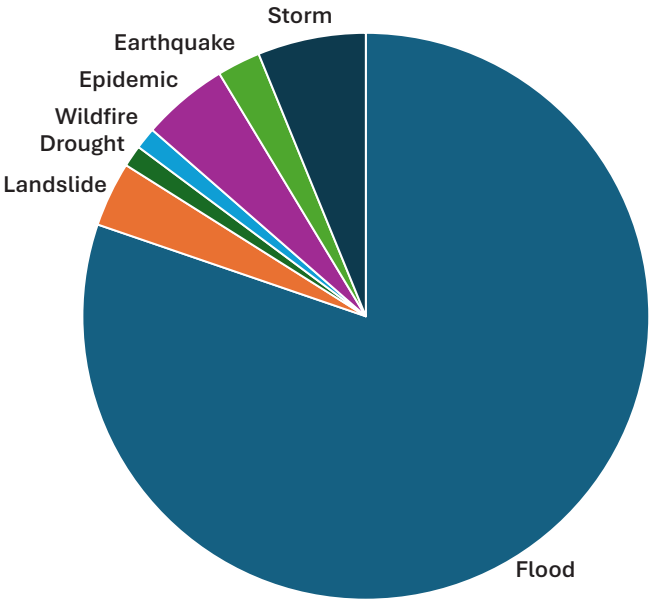


Figure 3: Total Disasters, by Hazard

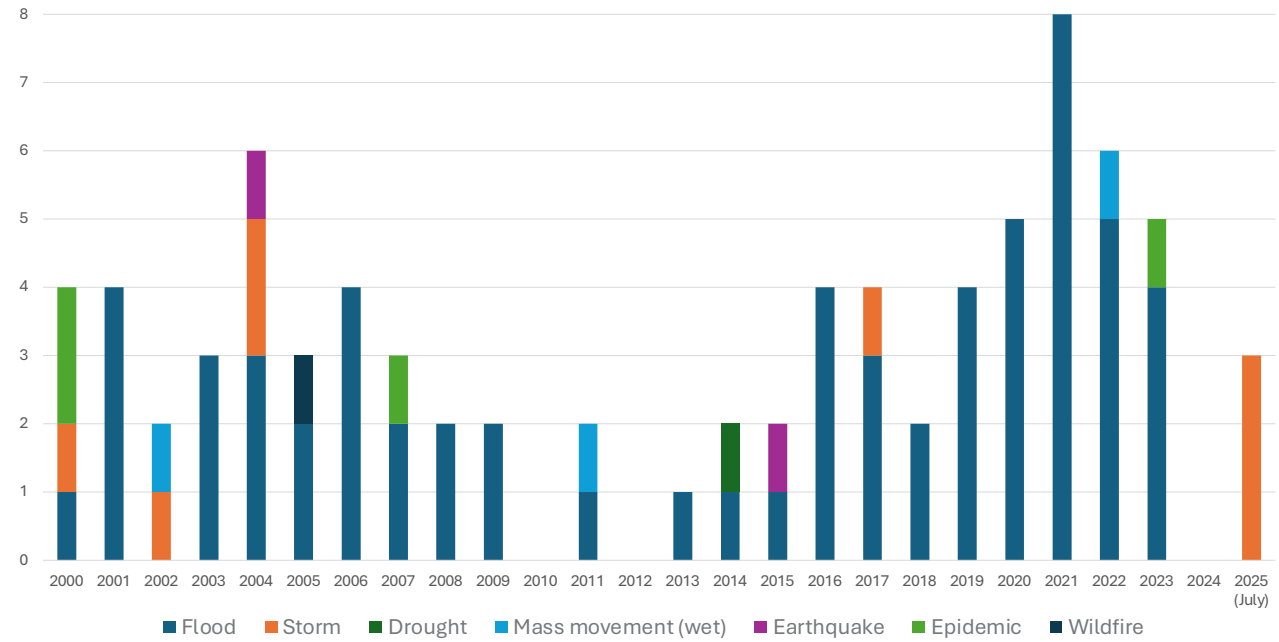


Figure 4: Hazard Events, by Year

Other high-fatality events included a 2015 water transport accident that killed 61 people, flash floods in 2021 that resulted in 56 deaths, and a 2007 dengue outbreak with another 56 deaths. It is important to note that many hazards that are common in Malaysia have resulted in no reported fatalities. This phenomenon may indicate either zero deaths or gaps in reporting. Figure 5 shows that, in terms of natural hazard–related deaths, floods are the leading cause, followed by epidemics.

Flooding is not only the most frequent hazard event in Malaysia but also the most consequential, both in scale and distribution. Figure 6 highlights that floods cluster strongly between November and January, during the Northeast Monsoon. Other hazards occur more sporadically; storms are scattered across different months, epidemics appear in isolated years, and earthquakes remain rare. When floods are excluded, no single hazard dominates the seasonal pattern, a finding that underscores how disproportionately floods shape Malaysia's disaster profile.

Geographically, floods are recorded across nearly all regions, as shown in Figures 7 and 8. Once floods are removed, however, patterns of other hazard events emerge more clearly. Landslides cluster in steep, hilly terrain; storms affect coastal areas; and epidemics are spread more diffusely, reflecting human settlement patterns rather than physical geography. This layered risk picture suggests that while flood preparedness is a national priority, localized strategies remain necessary for other hazards.

Figure 9 shows the number of people affected according to the hazard and year. Floods are the most consistently disruptive hazard, with annual impacts often in the tens of thousands.

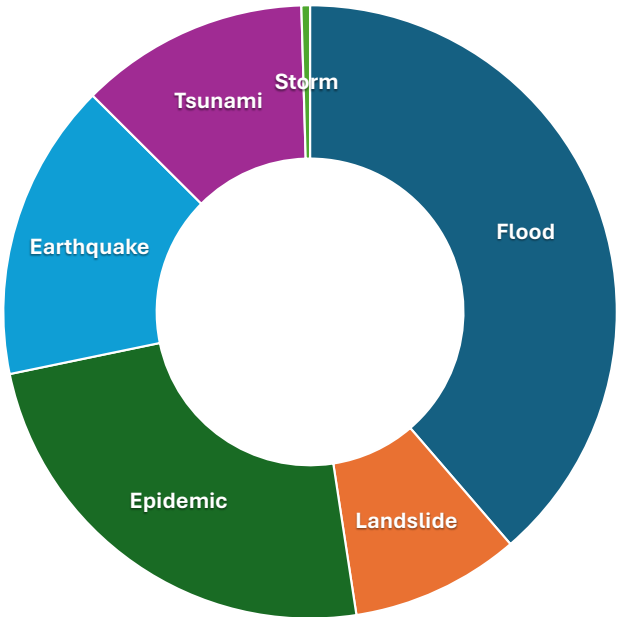


Figure 5: Deaths from Natural Hazards (2000-2025)

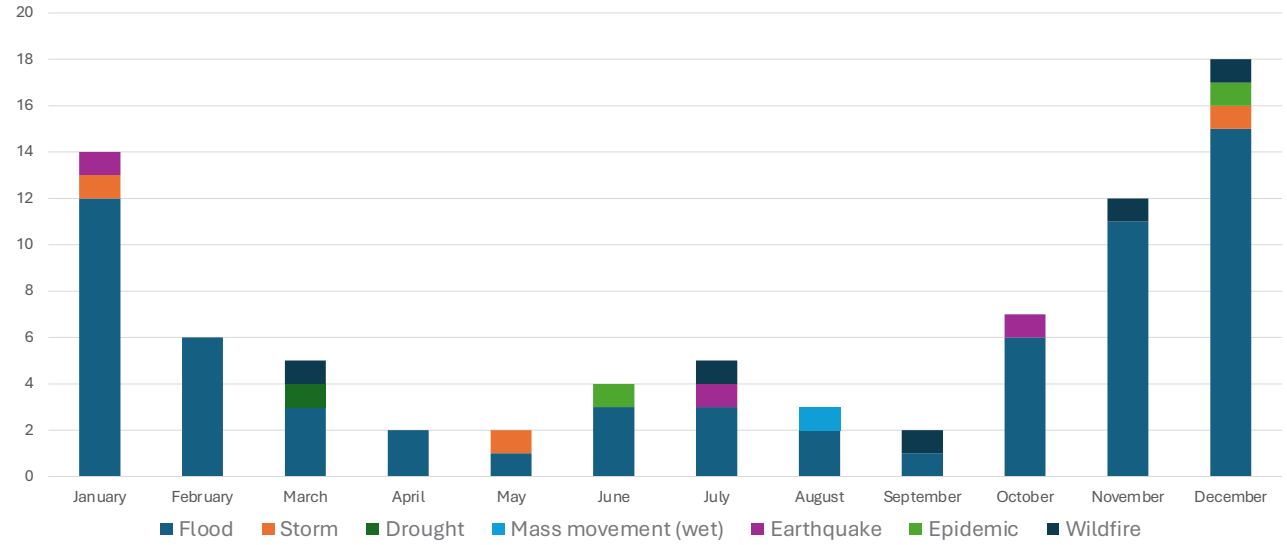


Figure 6: Hazard Events, by Monthly Occurrence

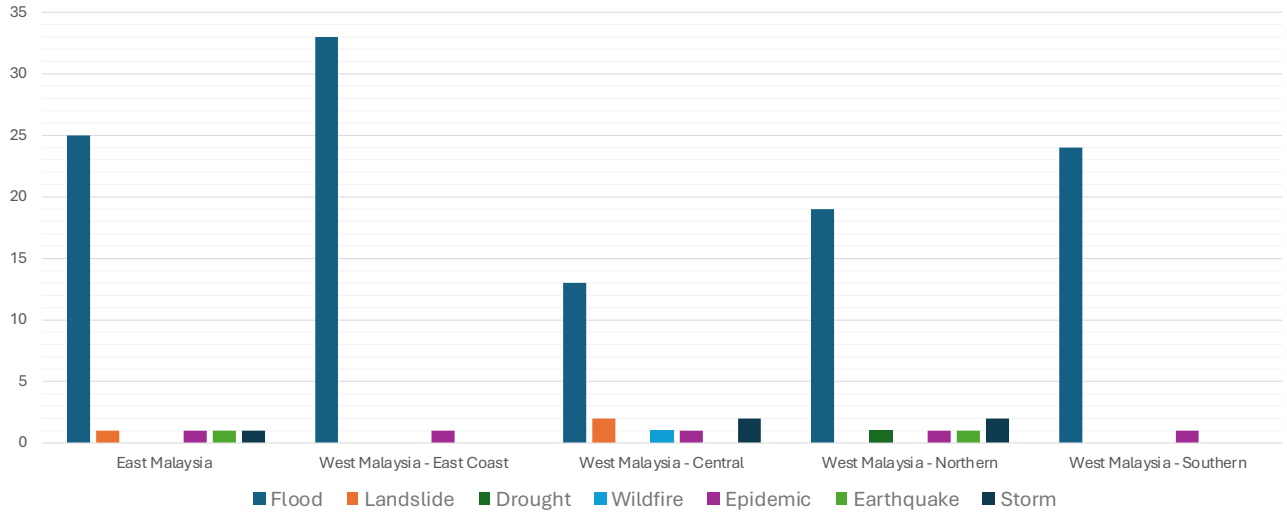


Figure 7: Geographic Spread of Natural Disasters, by Region

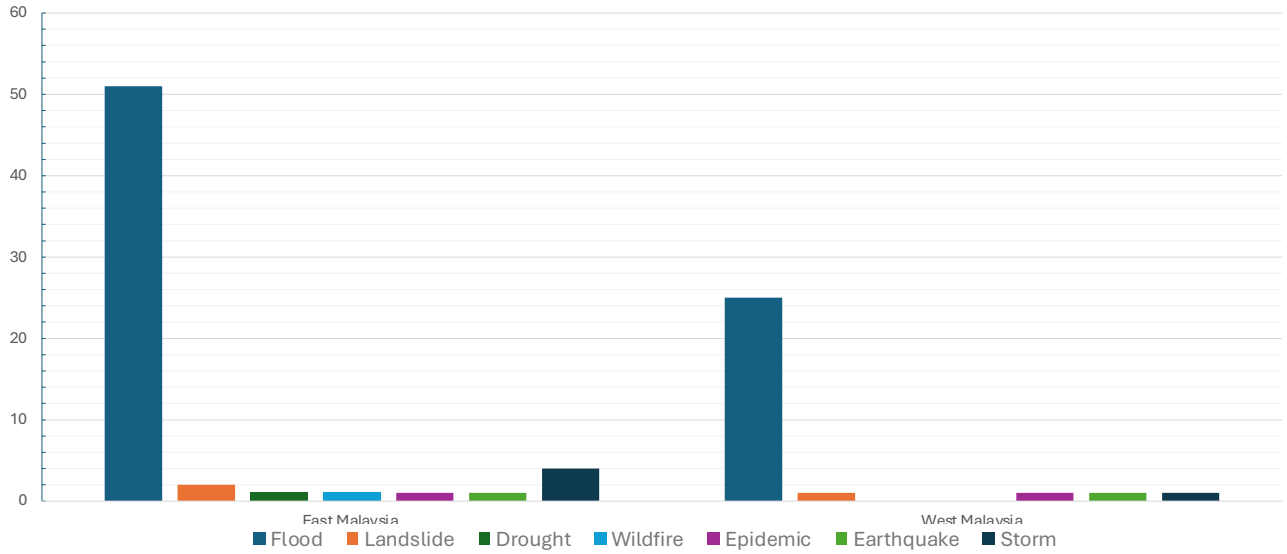


Figure 8: Geographic Spread of Natural Disasters, East vs. West Malaysia

of people and several years exceeding 100,000 people affected by flooding. The 2015 drought is an extreme outlier; it affected more than 2.2 million people nationwide. Other hazards contribute more episodically; a storm in 2007 affected about 41,000 people, an earthquake in 2018 affected approximately 5,000, and a dengue outbreak in 2023 affected more than 120,000. Landslides and wildfires rarely displaced more than a few dozen people. When the 2015 drought is excluded, as shown in Figure 10, floods remain the dominant hazard in terms of people affected, followed by epidemics and storms.

Overall, flooding dominates both the seasonality and geography of hazard exposure in Malaysia. Floods are nationwide, seasonal, and increasing in frequency, while the incidence of landslides, storms, and epidemics is shaped by local geography or settlement patterns. The rare but extreme 2015 drought demonstrates how climate variability can generate massive impacts even from hazards that otherwise occur infrequently.

The vulnerability of people in hazard-prone areas is a distinct issue from exposure itself. While many individuals and community assets may be at risk, their capacity to withstand or adapt determines whether a hazard event escalates into a disaster. When people lack the means to avoid the hazard, they are directly affected. It is important to note that none of the preceding graphs capture resilience or coping capacity because they do not display community or government responses.

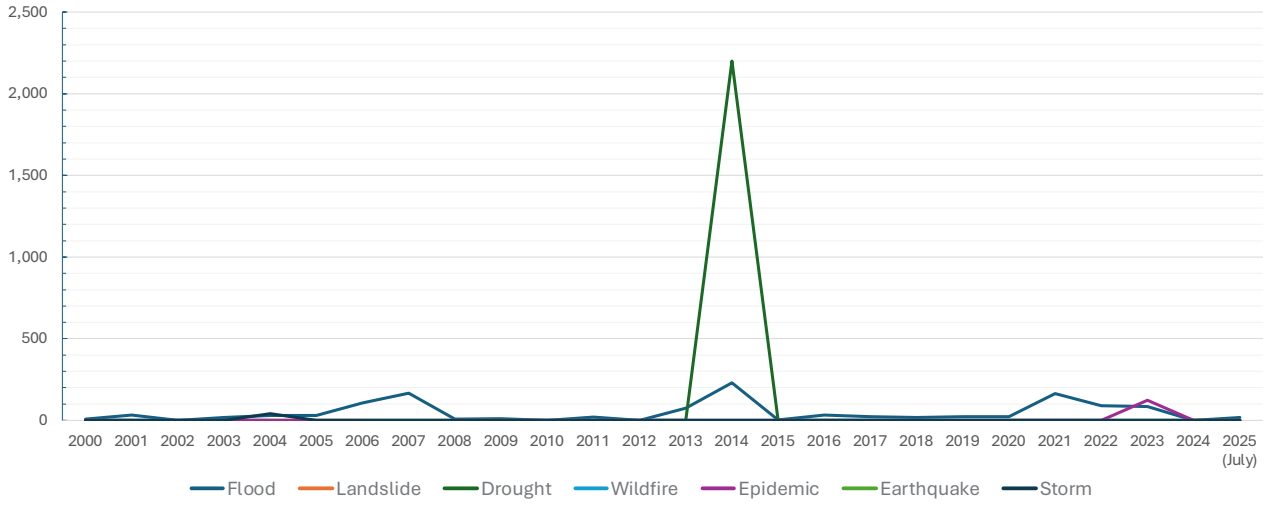


Figure 9: Number of People Affected, by Hazard and Year

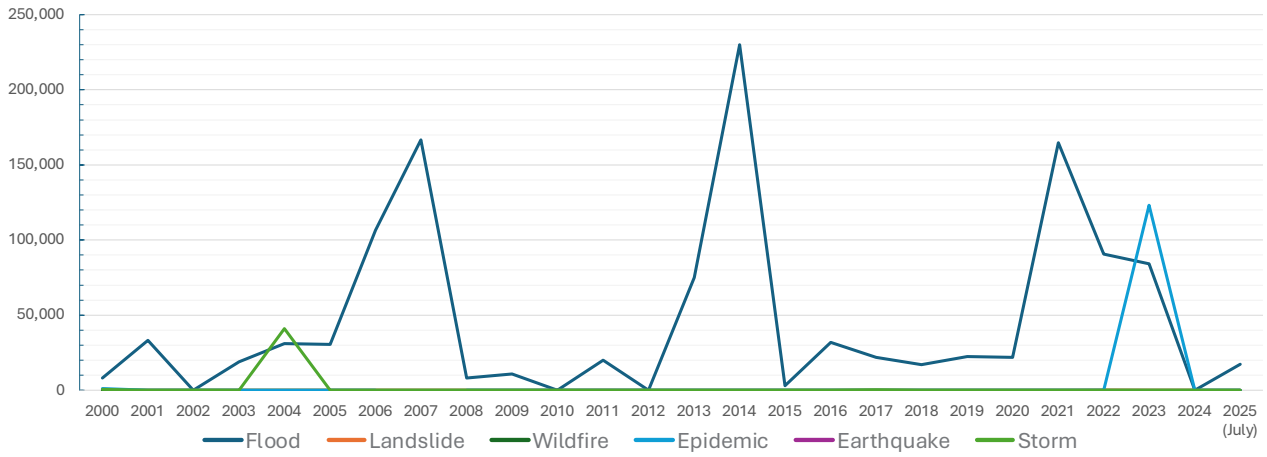


Figure 10: Number of People Affected, by Hazard and Year, Drought Removed

Recent Disasters

This section provides a short synopsis of disasters occurring in the past 10 years, with a focus on impacts.

Floods and Landslides – September-October 2025

In September 2025, floods and landslides in Sabah State killed at least 14 people and displaced at least 2,256 people to evacuation centers. As many as 120 villages were affected across the districts of Membakut, Penampang, Papar, Beaufort, and Sipitang. Sarawak's State Disaster Management Committee also reported that its Dewan Suarah Marudi relief center sheltered displaced people.[98]

The following month, Malaysia experienced further heavy rainfall and strong winds that started 4 October and led to floods and severe weather-related incidents. As of 6 October, 219 people were displaced in 4 evacuation centers; they included 193 people affected by flooding in Kedah and Perak states and 24 people affected by strong winds in Kuala Lumpur.[99] By 21 October, floods and storms had impacted the states of Selangor, Johor, and Melaka in Peninsular Malaysia. An additional 139 individuals were reportedly displaced; they included 84 people in Pontian (Johor), 51 in Jasin (Melaka), and 4 in Kuala Langat (Selangor), with affected persons taking shelter in 3 evacuation centers.[100]

Monsoon Floods – November-December 2024

The 2024 Northeast Monsoon brought widespread flooding to nine states across Peninsular Malaysia. They forced mass evacuations as rivers overflowed and low-lying areas filled rapidly. At the height of the event, between 95,000 and 139,000 people were displaced, and fatalities were reported in multiple states.[101] By 28 November, at least four people had been killed.[102] Agricultural areas were inundated, homes were destroyed, and transport links were severed, disrupting local economies and livelihoods. The scale of displacement made it one of the largest flood emergencies Malaysia has faced in recent decades.[103] Photo 2 shows the Malaysian Red Crescent responding to the Northeast Monsoon Flood during November-December 2024.[104]

Drought – 2023-2024

The strong El Niño that emerged in 2023 affected water supply and agriculture in Southeast Asia. By March 2024, heat wave or

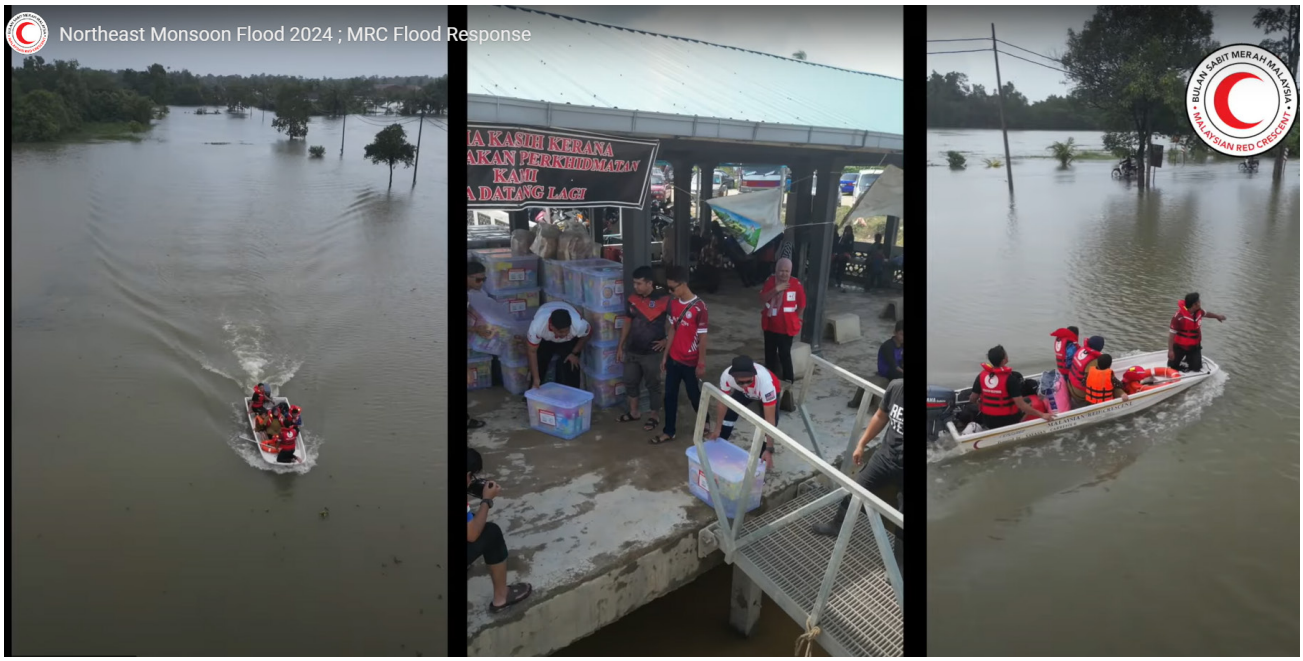


Photo 2: Malaysian Red Crescent Responding to Northeast Monsoon Flood (2024)

drought affected 12 districts in Sabah state, where 58,080 families needed clean water supplied with state government funding. Sabah's Papar District was officially declared a drought disaster area, impacting some 150,000 residents. Other affected areas included some northern areas and states along Peninsular Malaysia's east coast.[105] By mid-2025, Malaysia's water sector was grappling with mounting losses, driven by a combination of failing water infrastructure and prolonged drought conditions. Several states were operating below critical water reserve margins, signaling severe stress on water security and infrastructure. The prolonged dry period affected agricultural production and water available for human consumption.[106]

Dengue Outbreak – October 2023

By October 2023, Malaysia had recorded a sharp increase in dengue infections, with 96,443 cumulative cases for the year. This total marked a rise of 100.5% compared to the same period in 2022. The death toll, by 22 October 2023, stood at 73, compared to 29 deaths by the same date the previous year. The outbreak affected approximately 240,000 people. Selangor emerged as the most affected state, the scene of 51 of the 73 national hotspots. Urban poor communities and migrant worker populations were especially impacted in a reflection of vulnerabilities tied to housing density, sanitation, and drainage. The outbreak triggered alarm ahead of the monsoon season, when vector breeding was expected to worsen.[107]

Johor Floods - March 2023

Days of intense rain forced approximately 40,000 people from their homes in Johor. At least four deaths were reported. Towns such as Batu Pahat and Yong Peng saw extensive residential inundations; authorities opened hundreds of temporary shelters as rivers overtopped their banks.[108]

Landslide and Flooding - December 2022

On 16 December 2022, persistent heavy rain caused a catastrophic landslide at an unlicensed campsite in Batang Kali, Selangor. Soil and debris engulfed campers overnight. There were 31 confirmed deaths (including 13 children). Ninety-two people were affected overall, with many rescued from buried tents.[109]

Floods – July 2022

From 4 July 2022, heavy rainfall affected northern Peninsular Malaysia (particularly Kedah State). The rainfall caused flooding, flash floods, and rivers to overflow, with the Ketil River among the most affected. Per the ASEAN Disaster Information Network (ADINet), at least three fatalities were reported and more than 1,400 people evacuated to emergency accommodations in eastern Kedah State. At least six houses were destroyed and 70 damaged.[110]

Floods and Landslide – March 2022

Heavy rain started on 5 March 2022 and caused flooding in Greater Kuala Lumpur, Melaka, Negeri Sembilan, and Selangor as precipitation extended over several days. Flooding in the Klang Valley caused severe traffic problems in Kuala Lumpur. A total of 1,291 people moved to evacuation centers across affected areas, mostly in Selangor where the districts of Gombak, Hulu Langat, Kuala Langat, Petaling, and Sepang were affected.[111] The heavy rains triggered a landslide on 10 March in Selangor's Hulu Langat District; it killed four people, injured one person, and affected at least 75 people, including 14 people displaced. Fifteen houses were damaged or destroyed.[112]

Floods – February 2022

Flooding affected Kelantan, Pahang, and Terengganu States after heavy rains during 25-27 February. An estimated 1,916 families (5,653 people) were displaced to 63 evacuation centers in Jeli, Kota Bharu, Kuala Krai, Machang, Pasir Mas, Pasir Puteh, and Tanah Merah (Kelantan State). An additional 2,122 families (6,680 people) were displaced to 120 evacuation centers in Besut, Dungun, Hulu Terengganu, Kemaman, Kuala Nerus, Kuala Terengganu, Marang, and Setiu (Terengganu State).[113]

Peninsular Floods - December 2021

In December 2021, Malaysia experienced one of its costliest disasters of the century when days of intense monsoon rainfall triggered widespread flooding across at least eight states, with Selangor and Pahang among the hardest hit. Entire neighborhoods in the Klang Valley were submerged, and major highways and industrial zones were inundated. At the peak of the disaster, more than 40,000 people were displaced, and official reports confirmed between 54 and 56 fatalities. The Department of Statistics later estimated total economic losses at MYR 6.1 billion (about US$1.46 billion), reflecting heavy damage across housing, vehicles, manufacturing, agriculture, and infrastructure. The scale of human displacement and the breadth of economic disruption underscored the vulnerability of Malaysia's densely populated lowland and urban areas to extreme rainfall events.[114]

Floods – August 2021

On 18 August 2021, a flash flood from the foothills of Mount Jerai (Gunung Jerai) affected Kedah State. Heavy downpours caused water surges and landslides on Gunung Jerai. Some 1,149 people in Yan District and 320 households in Kuala Muda District were affected by muddy flash floods. Out of 4,825 people affected by the flash flood, only 43% went to evacuation centers. Some people were hesitant to evacuate due to fears of COVID-19 transmission. Flash floods destroyed farmland and plantations and caused livestock loss, destroying critical livelihoods and safety net assets. Some farmers lost harvests due to the flood, which hit just as the rice harvest was due later in the month.[115]

Floods – May 2021

On 20 May 2021, heavy rainfall occurred in Sabah State and caused flooding in Beaufort and Tenom districts when the Pagalan and Pada Rivers overflowed. A total of 1,552 families (5,782 people) were affected.[116]

Floods – January-May 2021

Very heavy rains, which began on 2 January 2021, caused flooding in five states in Peninsular Malaysia on the morning of 4 January. NADMA estimated that 11,973 families were affected by the floods, and 8 deaths were reported. A total of 42,947 people were evacuated to 397 evacuation centers in 27 districts. Continuous heavy rains resulted in floods in Terengganu, Kelantan, and Sabah States. There were reports of damage to roads alongside landslides, and minor damage to houses.[117]

Floods – October-November 2020

In mid-October 2020, heavy rains affected various parts of the country. On 8 October, heavy rain across Eastern Malaysia triggered floods and resulted in the evacuation of 400 people to 6 relief centers. Damage was reported to hundreds of buildings across Kota Kinabalu, Kota Belud, Tuaran, and Telipok Districts in Sabah State.[118] On 10 November, a landslide occurred in Tambun Town in Perak State on the west coast of Peninsular Malaysia where two people were killed. Floods in Sabah's Keningau District also killed two people after the Liawan River overflowed.[119] On 23 November, flooding in Terengganu State displaced 361 people to 12 evacuation centers.[120] By 26 November, more than 1,200 people were reported to have evacuated across the States of Perak, Terengganu, Johor, and Kedah.[121]

Floods – May-July 2020

Starting 8 May 2020, widespread floods due to heavy rain affected Betong District (Sarawak State) and resulted in casualties and damage. At least 650 families were affected, and several houses and roads were flooded.[122] From 17 May, floods triggered by the rains flooded at least 80 houses and several roads in Penang State. In Perak State, people evacuated after the overflow of the Bernam and Kuala Slim Rivers caused the inundation of several houses.[123] On 20 June, floods due to heavy rains hit Johor State and forced 1,210 people to evacuate to 18 centers in Muar, Batu Pahat, Tangkak, Kluang, and Pontian Districts.[124] From 27 June, heavy rainfall affected Eastern Malaysia, particularly

Sabah State, where it triggered floods and caused damage. After 29 June, floods were reported in Sarawak State, where heavy rain hit remote areas in the districts of Baram, Marudi, Long Lama, Lawas, and Limbang. By 1 July, around 1,100 people had evacuated from Tenom, Kota Belud, Papar, Beaufort, and Penampang Districts. A reported 152 villages across 11 districts were affected in Sabah State.[125]

Floods – November 2019-May 2020

From November 2019, heavy rains had been affecting Malaysia, particularly the northern states of the Peninsula, and by December flooding caused mass disturbances along Peninsular Malaysia's east coast. River water levels rose in Kelantan and Terengganu States. On 29 November, Sungai Golok at Jenob Tanah Merah and Sungai Lebir in Tualang Kuala Krai breached warning levels. Three rivers in Setiu and one in Besut, in Terengganu State, also breached their water level danger points. On 3 December, more than 15,000 people evacuated to designated relief centers in Kelantan and Terengganu States. The Pasir Mas district in Kelantan was the worst affected district. It was only accessible to watercraft and saw almost 2,000 families evacuate to evacuation centers. After the water receded, most of the evacuation centers closed on 5 December, with most families returning to their homes or living in relatives' houses.[126]

COVID-19 Pandemic - 2020-2023

The COVID-19 pandemic represents the most severe communicable disease outbreak in Malaysia's history. COVID-19 claimed 471 lives in 2020, 31,016 in 2021, and 5,366 in 2022. To curb transmission, the government implemented a nationwide Movement Control Order beginning on 18 March 2020; it was rolled out in four phases over two months. Malaysia's case fatality rate remained below the global average, an achievement attributed to early preparedness, the capacity of the public health and hospital system, strict enforcement of movement control, and comprehensive measures including contact tracing, active case detection, and quarantine protocols.[127]

Dengue – December 2019-March 2020

Malaysia reported 130,101 dengue cases in 2019 and 90,304 cases in 2020. There were at least 182 deaths in 2019. Hardest hit was Selangor state, which recorded 72,543 cases and 56 dengue-related deaths from January to 28 December 2019. The next worst were Kuala Lumpur and Putrajaya, which together recorded 15,424 dengue cases and 10 deaths during the same period. Johor, Kelantan, and Sabah were in third, fourth, and fifth places, recording 10,873, 6,003, and 5,478 cases, respectively, during the year.[128] In 2020, Malaysia seemed on trend to continue experiencing higher numbers of dengue, but transmission was disrupted by the COVID-19 pandemic, which led to the government imposing movement control orders that implemented various lockdowns starting in March 2020.[129] The rise in dengue cases up to that time was not isolated to Malaysia. From 2015 to 2019, dengue cases in Southeast Asia increased by 46% (from 451,442 to 658,301).[130]

Floods – January 2018

Areas of the country experienced flooding caused by heavy rains that began on 1 January 2018. The floods forced approximately 12,000 people to evacuate their homes nationwide and led to two fatalities in Pahang State. By 4 January, 11,991 flood-affected people were sheltering at relief centers in Johor, Terengganu, Pahang, and Sabah. As of 5 January, Pahang was the worst-hit state with 9,366 flood evacuees from the districts of Kuantan, Rompin, Pekan, Jerantut, Lipis, and Bera. In Teregganu State, there were up to 2,159 flood evacuees sheltering in 17 relief centers in Kemaman and Dungun districts.[131]

Penang–Kedah Floods - November 2017

In November 2017, intense rainfall from a tropical depression struck Penang and Kedah. It led to five deaths, over 9,500 evacuations, and an estimated MYR 328 million (US$76 million) in economic losses, particularly in George Town

and surrounding urban areas.[132]

Floods – December 2016

Starting 26 December 2016, continuous heavy rains fell in Peninsular Malaysia's east coast states where they caused flooding in Kelantan and Terengganu. About 25,000 people were displaced. In Kelantan, three main rivers overflowed and flooded several districts including Bachok, Gua Musang, Jeli, Kota Bahru, Machang, Pasir Mas, Pasir Puteh, Tanah Merah, Tumpat, and Kuala Krai. In Terengganu State, three rivers reached critical levels, prompting the authorities to evacuate communities from riverside districts. Schools not flooded were used as evacuation centers.[133]

Drought and Heat Wave – April 2016

On 26 April 2016, Malaysia recorded its second fatality from heatstroke. The country had recorded 200 cases of heatstroke, including the first fatality, the previous month as it suffered from a heat wave, which caused rivers and reservoirs to dry up. Parts of the country were also experiencing drought. Seven dams recorded water levels below 50%. The water level in Linggiu Reservoir in Johor rapidly fell to historic lows, registering at 35% as of 22 April. As much as 757,000 cubic meters (200 million gallons) of water a day was pumped from the Jus Dam to the Durian Tunggal Dam to stabilize the water supply.[134]

Floods – February 2016

In early February 2016, heavy rainfall commenced and caused major flooding in several states including Sarawak, especially in Serian and Simunjan divisions. In Serian, 315 families were affected and moved to 2 evacuation centers. In Simunjan, 85 families moved to evacuation centers.[135]

Sabah Earthquake – June 2015

On 5 June 2015 at 07:15 local time, a 5.9-magnitude earthquake with a depth of 10 km (6.2 mi) occurred in Ranau town, Sabah State. There were 18 fatalities, including 6 Singaporean children on a school trip. Most of the fatalities were hikers on the slopes of Mount Kinabalu where the earthquake triggered rockslides. Local Sabah mountain guides on site were the first rescuers. They navigated new paths where the quake had destroyed old trails, and they were joined by government agencies responding and assisting after they were able to access the area. MERCY Malaysia reported 130 people were rescued off the mountain.[136] The quake damaged roads and buildings, including schools and a hospital on Sabah's west coast, and it broke one of the twin rock formations on Mount Kinabalu. There was more than MYR100 million (US$23 million) in damage to buildings and infrastructure.

Photo 3, by IFRC/Fadza Ishak, shows a Malaysian Red Crescent volunteer unloading relief supplies from a boat to assist communities in Terengganu state affected by severe flooding in 2021.[137]



Photo 3: A Malaysian Red Crescent volunteer assists flood-affected communities in 2021.

DISASTER MANAGEMENT POLICY, PLANNING, AND RESPONSE

Malaysia has progressively shifted toward a proactive DM approach that addresses prevention, mitigation, preparedness, response, and recovery. In the past decade, following widespread flooding in December 2014, the Cabinet agreed upon the establishment of NADMA to take over as the lead DM agency at the national, regional, and international levels.[138] Most recently, in 2024, NADMA Directive No. 1 outlined a more comprehensive DM and DRR policy and mechanism, further empowering NADMA as the primary agency coordinating DM across government agencies and administrative levels.[139]

National Disaster Management System

The National Disaster Management Agency (NADMA) is Malaysia's lead agency for DM and DRR at the national, regional, and international levels. In the wake of devastating flooding in 2014, NADMA was established in 2015 and took over as DM lead from the National Security Council (NSC).[140] On 1 August 2024, in response to emerging trends and worsening disasters, the NSC, chaired by the Prime Minister, issued NADMA Directive No. 1: National Disaster Management Policy and Mechanism; it replaced NSC Directive No. 20. The new Directive more comprehensively outlined DM and DRR mechanisms, improved alignment with international frameworks, and defined roles for different DM stakeholders to avoid discrepancies or duplication in dealing with disasters. According to Directive No. 1, NADMA's responsibilities are:

- Lead DM and DRR at the national, regional, and international levels
- Develop and maintain strategies, instructions, action plans, directions, and guidance documents related to DM and DRR at the policy level
- Ensure smooth implementation of DM and DRR policies and mechanisms
- Advise agencies on DM and DRR as appropriate
- Advise the Chairs of District Disaster Management Committees (JPBD), State Disaster Management Committees (JPBN), and Central Disaster Management Committees (JPBP), or of another lead agency to take action before a disaster incident becomes more difficult to handle, including in the post-disaster stage
- Support or assist in coordinating movement of government agencies in responding to disasters
- Collect, analyze, and disseminate disaster information through the National Disaster Command Centre (NDCC)
- Regulate and audit DM and DRR activities by government agencies and direct improvements
- Provide secretarial services to JPBPs
- Manage and mobilize the SMART for SAR operations at home and abroad
- Manage the National Disaster Relief Trust Fund
- Plan and coordinate policies and supervise implementation of integrated DM exercises and simulations
- Monitor and ensure the implementation of DRR measures carried out by government agencies
- Plan and coordinate policies and oversee the implementation of education, training, and awareness strategies for officers and members of government agencies, statutory bodies, the private sector, voluntary bodies, and the public
- Ensure that a DM after action review is held after a disaster response
- Coordinate the assessment of disaster loss and damage by government agencies
- Assess, coordinate, and lead humanitarian assistance and disaster response missions abroad

- Assess and coordinate humanitarian assistance and disaster response domestically[141]

Figure 11 shows NADMA's organizational chart.[142]

The Special Malaysia Disaster Assistance and Rescue Team (SMART) was established in 1995 after an NSC directive that reflected the experience of the 1993 collapse of the Highland Towers, where 48 people were killed. In 2015, when NADMA was established, SMART fell under the new agency's purview. The SMART leads SAR operations both domestically and internationally. In 2016, the UN Office for the Coordination of Humanitarian Affairs (OCHA) recognized SMART as a Heavy Urban Search and Rescue (USAR) Team, as it met the criteria set by the International Search and Rescue Advisory Group (INSARAG). Malaysia and Singapore are the only two Southeast Asian countries with this recognition, which provides a marker of their capability and expertise in the SAR field. SMART is preparing for renewed INSARAG certification in 2026. The Team has approximately 200 personnel from the police, army, and fire and rescue department.[143]

SMART has participated in numerous international rescue missions, including earthquake relief efforts in Türkiye (1999 and 2023), Gujarat, India (2001), Pakistan (2005), Padang, Indonesia (2009), and Nepal (2015). The team also played a crucial role in responding to the 2004 tsunami in Aceh, Indonesia, and provided aid during Typhoon Haiyan in the Philippines in 2013. In 2014, SMART was deployed to Ukraine following the downing of flight MH17. In March 2025, SMART was mobilized to join SAR operations in earthquake-hit Myanmar.[144]

Malaysia is one of many countries that has adopted and adapted the "Cluster Approach" to coordinate disaster response and delivery of

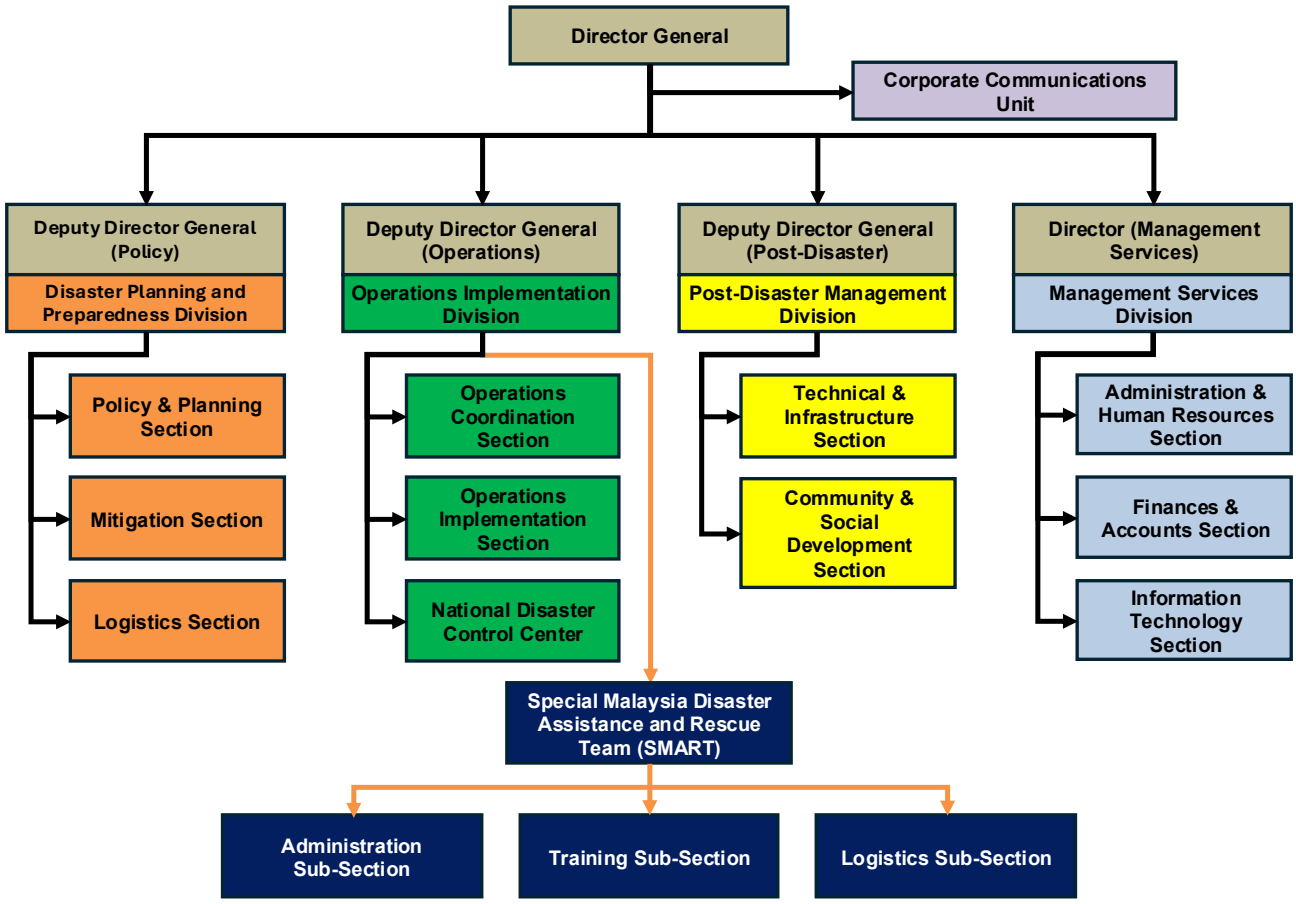


Figure 11: NADMA Organization Chart

humanitarian relief at national and local levels. Figure 12 depicts how the country has used this approach.[145] The Cluster Approach is used by the international humanitarian community at the global level to organize humanitarian coordination in an international response by functional clusters or sectors. At the global level, an international organization leads each cluster. Malaysia has proactively designated relevant ministries or agencies to act as national cluster lead for humanitarian coordination during disaster response within Malaysia. The Clusters and their national leads are:

- Early Recovery — Malaysia Public Works Department (JKR)
- Education — Ministry of Education (MOE)
- Emergency Telecoms — Malaysian Communications and Multimedia Commission (MCMC)
- Food Security — Ministry of Agriculture and Agro-Based Industry (MOA)
- Health — Ministry of Health (MOH)
- Logistics — Malaysia Volunteers Corps Department (RELA)/ Ministry of Transport (MOT)
- Nutrition — Ministry of Agriculture and Food Security (MAFS)
- Protection — Royal Malaysia Police (PDRM)
- Shelter — Department of Social Welfare (JKM)
- Water, Sanitation and Hygiene — National Water Services Commission (SPAN)

Recent reforms aim to modernize operations. In 2022, with the support of the Department of

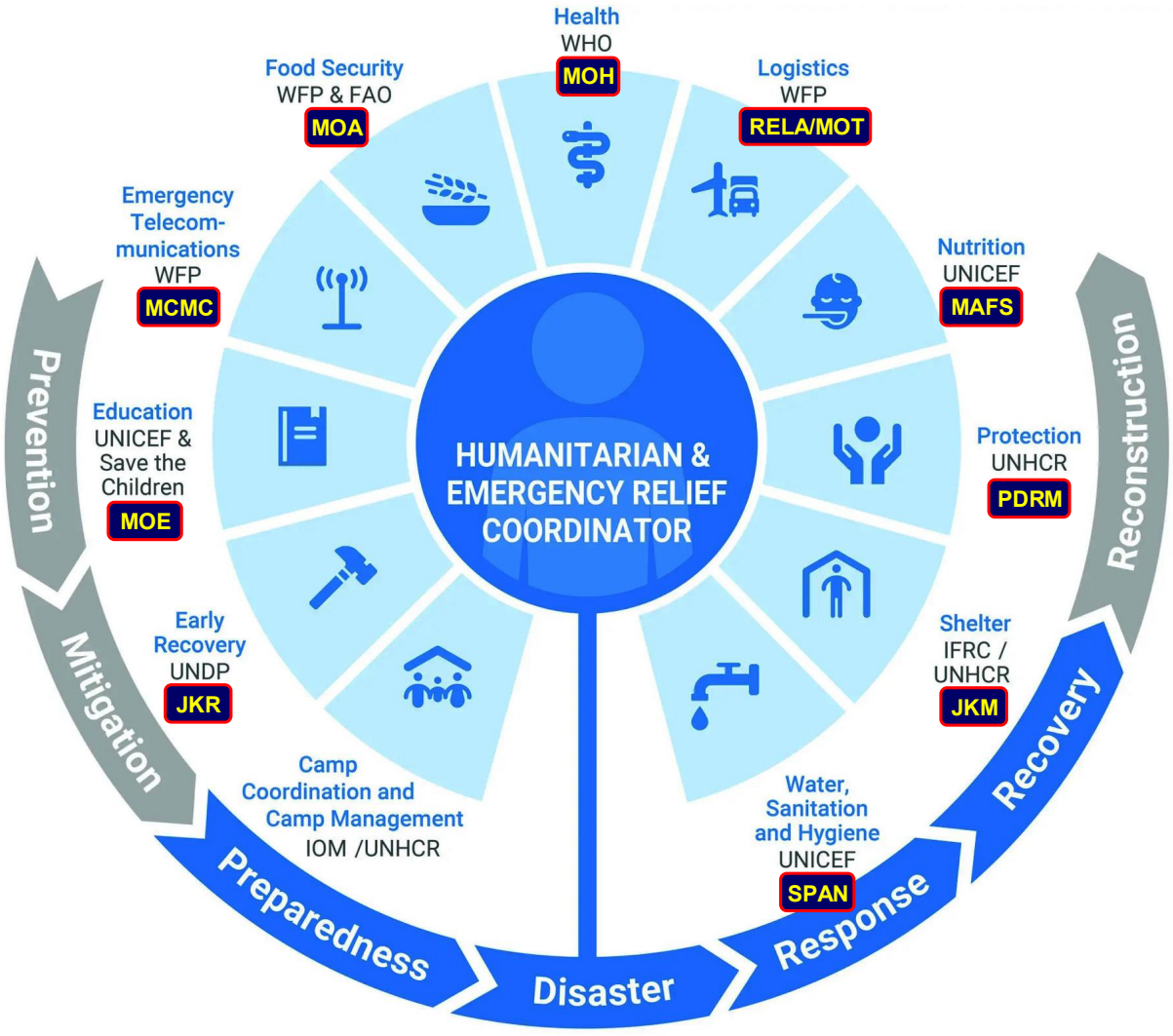


Figure 12: Cluster Approach to Humanitarian Coordination in Malaysia

Survey and Mapping, NADMA launched the Defence Geospatial Information Management (DGIM) platform to support real-time monitoring and centralized data analysis via the NDCC.[146] At the same time, NADMA has placed greater emphasis on community-based disaster risk management (CBDRM) to complement the traditional top-down model. In 2014, it published the National CBDRM Guideline. However, challenges remain, particularly due to limited local funding, implementing capacity, and public awareness.[147]

The National Policy on Disaster Risk Reduction (DRR Policy) 2030 was launched in October 2024 to provide guidance for reducing disaster risk to protect life and property through prevention, mitigation, preparedness, response, and recovery.[148] The DRR Policy outlines four principles – shared responsibility, inclusiveness, participation, and localization – and five strategic pillars – strengthening governance, investing in disaster risk management (DRM), improving risk understanding, capacity building and community engagement, and enhancing preparedness for effective disaster response and better post-disaster recovery. Progress in the five strategic pillars is monitored through the achievement of six key targets:

1. Reduce the number of people affected by disasters by 2030
2. Reduce direct economic losses due to disasters
3. Reduce damage to critical infrastructure and disruption to basic supplies
4. Increase the number of states, districts, and local authorities that have DRR strategies by 2030
5. Strengthen international cooperation
6. Increase preparedness and access to early warning systems (EWS), risk information, and disaster risk assessment[149]

Subnational and Local Implementation

To manage disasters in an integrated system, DM Committees are established at three levels – federal, state, and district – in accordance with NADMA Directive No. 1. The level with control of the response depends on the scope and scale of the disaster. Additionally, multiple standard operating procedures outline mechanisms, roles, and responsibilities of various agencies depending on the disaster type – floods, forest fires, haze, industrial disasters, etc.

In non-emergency periods, DM Committees at all levels meet at least three times a year to discuss strategic matters, including DRM policies and preparedness plans. At the Federal level, the Committee is chaired by the Deputy Prime Minister, or a Minister appointed by the Prime Minister.

When a disaster strikes, the affected jurisdiction or jurisdictions activate their Disaster Operation Control Centres to monitor the situation and address operational needs. Leadership is provided by the Chair of DM Committee at the respective administrative level. Daily meetings are conducted at the operational level to monitor needs, facilitate resourcing, and provide situation updates to the national emergency operations center (EOC). As soon as a disaster occurs, the on-scene Command Post is also activated to conduct tactical ground operations. On the ground, various agencies carry out SAR, medical assistance, technical expertise, welfare, safety, security, media management, and other support functions. Ground operations are coordinated by the PDRM, which provides the on-scene commander, with a deputy commander from the Fire and Rescue Department (JBPM).[150]

Additional key players are JKM and the Malaysian Civil Defence Force (APM). PDRM, JBPM, JKM, and APM all maintain representation within DM Committees at all administrative levels.[151] APM acts as the Secretariat for the DM Committee at the state and district levels, while NADMA fills this role at the national level. APM has a dedicated Special Disaster and Emergency Response Team (SPIDER Team), which carries out SAR operations in disasters locally, often in coordination with JBPM.[152]

Figure 13 depicts an overview of Malaysia's DM structure for both normal times and disaster/emergency operations.[153]

Civil-Military Coordination in Disaster Response

The Malaysian Armed Forces (MAF) have played an important role in supporting relief operations following major disasters. While their core task focuses on defending the country from external threats, the MAF also assist in disaster response operations when needed. Civil-military coordination in disaster relief is addressed in several policies and guidelines.[154]

During major disaster response operations, the MAF usually serve in a supporting role to civilian authorities, who lead response efforts. This support role is outlined clearly in NADMA Directive No. 1, which includes provisions of manpower, logistics services and assets, equipment, expert services, and air transportation, among others.[155]

Chief of Defence Force General Tan Sri Mohd Nizam Jaffar also reiterated the importance of local authorities and non-military agencies, when, during the September 2025 flood response, he noted that the armed forces are not responsible for flood management but work closely with civilian leaders.[156] That month, MAF deployed 600 officers and personnel to assist in landslide- and flood-affected areas in Sabah, where disasters killed at least 14 people and displaced more than 2,000 people.[157] The MAF pre-positioned assets by determining areas and types of assets to be placed on standby for quick mobilization. The MAF conducted simulation exercises to prepare for monsoon floods, and commanders of army camps scouted flood-prone areas.[158]

In December 2021, MAF also mobilized to assist relief operations in areas of the country hard hit by flooding during unusually heavy monsoon rains. More than 41,000 people were displaced due to the flooding that affected eight states - Kelantan, Terengganu, Pahang, Melaka, Negeri Sembilan, Selangor, Perak, and Kuala Lumpur.[159] Personnel and assets from the Army's 11th and 12th Brigades mobilized to Selangor, among the worst-hit states, to support relief efforts in the areas of Klang, Sepang, Damansara, and Bukit Lanchong.[160]

The MAF has also participated in international disaster response operations, including as part of Malaysia's response to the earthquake that struck Myanmar on 28 March 2025. On 30 March, Malaysia deployed, through NADMA, a SAR team comprising 16 MAF personnel, including 12 who were integrated with the SMART. The SMART also comprised 13 PDRM officers and 21 JBPM personnel. The Team was equipped with base of operations equipment, SAR tools, communication and

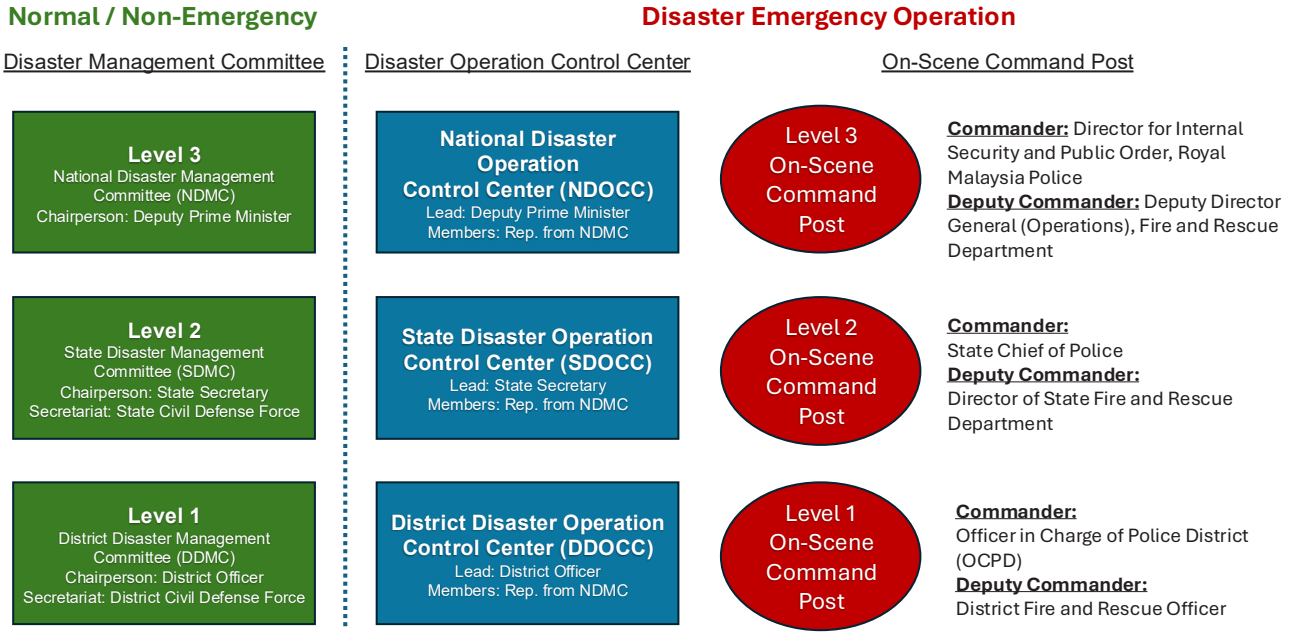


Figure 13: Malaysia Disaster Management Structure

medical supplies, a four-wheel-drive vehicle, and two trucks. The team and equipment flew on two Royal Malaysian Air Force (RMAF) Airbus A400M aircraft from Subang Air Base to Naypyidaw International Airport in Myanmar. The mission focused on an initial SAR phase, followed by coordination of humanitarian aid and provision of food, shelter, and clothing for affected communities.[161] Malaysia's Foreign Ministry facilitated all necessary visas and logistical arrangements, and the Malaysian Embassy in Yangon provided ground support and coordinated with local authorities and humanitarian partners.[162]

Photo 4, by NADMA, depicts the Malaysian SMART team responding in Sagaing to the earthquake that struck Myanmar on 28 March 2025.[163]

International / Regional Organizations

Malaysia is an active participant in developing regional and international frameworks, organizations, and mechanisms that shape its DM approach. Key inter-governmental organizations contributing to Malaysia's DM strategies are ASEAN and the UN.

The Sendai Framework for Disaster Risk Reduction 2015-2030 is the global blueprint and 15-year plan to build the world's resilience to natural disasters. On 13 October 2024, Malaysia's Deputy Prime Minister launched the country's DRR Policy in commemoration of the International Day for Disaster Risk Reduction. The formulation of this policy aligns with Target E of the Sendai Framework, which focuses on the development and implementation of national and local DRR strategies.[164] UNDRR is the UN's custodian for the Sendai Framework, which lays out seven targets and four priorities for action for countries. The seven targets relate to reducing disaster mortality, number of affected people, disaster economic loss, and disaster infrastructure damage; and increasing DRR strategies, international cooperation, and multi-hazard early warning systems (MHEWS). The four priorities for action are in the areas of understanding disaster risk, strengthening disaster risk governance, investing in disaster reduction for resilience, and enhancing disaster preparedness.[165]

The UN Sustainable Development Goals (SDG) also influence Malaysia's national approach to DRR. The SDGs are the core of the 2030 Agenda for Sustainable Development, which was adopted by all UN Member States in 2015. In total, there are 17 SDGs relating to reduction of poverty and inequality, and improvement of health, education, sustainable economic growth, environmental protection, and climate action by 2030.[166]



Photo 4: SMART Deployed to Myanmar after March 2025 Earthquake

The Women, Peace and Security (WPS) agenda is a global framework to increase the meaningful participation of women in peace processes and security efforts to improve social resilience.[167] It is anchored in UN Security Council Resolution 1325, which passed in 2000, and is informed by 10 subsequent resolutions. The WPS agenda builds upon evidence that women's participation contributes to positive outcomes, including

that peace processes are 35% more likely to endure for 15 years when women participate in its creation.[168] The contribution of women's participation to more resilient disaster response, DRR, and humanitarian action outcomes is also recognized. In September 2025, Malaysia launched its first National Action Plan on WPS, covering 2025-2030.[169] The national action plan directly addresses reducing the risks and impacts of disasters for women in the context of prevention, with a focus on strengthening women's roles in disaster preparedness and response, utilizing gender considerations to enhance disaster shelters to be safe and inclusive, and including women's perspectives in decision making.[170]

Association of Southeast Asian Nations

Malaysia served as the Chair of ASEAN for 2025. In 1967, Malaysia co-founded ASEAN together with Indonesia, Philippines, Singapore, and Thailand.[171] ASEAN has since expanded to include Brunei, Cambodia, Laos, Myanmar, Vietnam, and, most recently in October 2025, Timor-Leste.[172]

ASEAN is at the forefront of regional organizations in terms of a coordinated approach to DM. The aim is to ensure the safety of citizens and to mitigate the impacts of disasters through joint and coordinated approaches. The legal basis for ASEAN's regional approach to DM is the AADMER, which was signed in 2005 and came into force after ratification in 2009. AADMER, the world's first legally binding regional DM guidelines, aimed for joint disaster response and paved the way for ASEAN DM work programs, plans, exercises, and dedicated systems and centers.

The ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre) was established in 2011. It primarily works with the national disaster management organizations (NDMO) of ASEAN Member States (AMS), including NADMA, and it partners with international organizations, the private sector, and civil society. In the event of a very large disaster or a humanitarian situation with delicate political aspects, the AHA Centre works closely with the Secretary–General of ASEAN, who acts as the ASEAN Humanitarian Assistance Coordinator (SG-AHAC) to mobilize more resources and coordinate with ASEAN leaders and partners globally.[173] During a major disaster response, the SG-AHAC and AHA Centre, through its EOC, provide strategic cooperation at the regional level. At the operational level, cooperation is facilitated by the AHA Centre In-Country Liaison Team (ICLT), which embeds with the NDMO of the affected state within the national EOC together with civil-military liaison officers. At the tactical level, within the affected area, cooperation is facilitated by the ASEAN Emergency Rapid Assessment Teams (ASEAN-ERAT), which manages the Joint Operations and Coordination Centre of ASEAN (JOCCA).

The ASEAN-ERAT jointly responds to large disasters in support of the NDMO of the affected AMS. ASEAN-ERAT is deployable within 24 hours upon acceptance by the affected AMS and is self-sufficient with its own resources and equipment. Throughout its deployment, ASEAN-ERAT is under the direction, supervision, and control of the NDMO of the affected AMS. Its core functions are:

- Assess and estimate the scale, severity, and impact of the disaster, as well as the needs of the affected population
- Facilitate the reception of incoming assistance from other AMS and the AHA Centre
- Assist the NDMO in coordinating humanitarian response[174]

Malaysia actively participates in ASEAN and its DM mechanisms. It periodically hosts meetings of DM working groups. Between 2008 and 2020, Malaysia contributed 35 personnel to ASEAN-ERATs that deployed to disaster-affected AMS, and it also received the assistance of ASEAN-ERAT during flooding in 2015.[175] Mercy Malaysia is the only AMS-based NGO that is part of the AADMER Partnership Group,[176] which is a key ASEAN civil society partner that enables ASEAN-ERAT

capacity building. The Partnership Group is a coalition of seven international NGOs, including ChildFund International, HelpAge International, Oxfam, Plan International, Save the Children International, and World Vision International.[177]

Malaysia also hosts a Disaster Emergency Logistics System for ASEAN (DELSA) stockpile in Subang. DELSA was launched in 2012 to establish a regional stockpile of relief items and serve as a key mechanism to allow swift provision of relief to AMS following a disaster. Goods and equipment from the DELSA warehouse are prepositioned in the World Food Programme (WFP)–United Nations Humanitarian Response Depot (UNHRD) warehouse in Subang, Malaysia. The AHA Centre works closely with WFP–UNHRD on logistical and technical aspects, and it coordinates with the NDMO of the affected AMS to distribute relief goods as needed in support of a disaster response.[178]

East Asia Summit

The East Asia Summit (EAS) is the Indo-Pacific's premier forum for strategic dialogue. Malaysia hosted the inaugural EAS in Kuala Lumpur on 14 December 2005 and, as the 2025 ASEAN Chair, Malaysia was also the Chair of EAS for 2025. The EAS is the only annual forum held by leaders at which all key Indo-Pacific partners meet to discuss political, security, and economic challenges facing the region, and it has an important role to play in advancing closer regional cooperation. The members include all AMS as well as Australia, India, Japan, New Zealand, the People's Republic of China (PRC), the Republic of Korea, Russia, and the U.S.[179]

The EAS Rapid Disaster Response Toolkit was launched in June 2015 at the Indonesia-Australia EAS Rapid Disaster Response Workshop.[180] It is a reference guide for decisionmakers in sending or receiving international disaster assistance.[181] The toolkit aims to improve rapid disaster response capability and cooperation across EAS countries via three tools:

1. National Focal Point Table — contact information for disaster officials from each EAS country[182]
2. Guidance for Rapid Disaster Response — checklists of considerations, easy references, and template links[183]
3. EAS Country Disaster Arrangements — table of each country's arrangements for the reception and provision of rapid disaster response[184]

The toolkit, which is legally non-binding, explicitly states that it does not replace or seek to contradict ASEAN's DM agreements and mechanisms. The EAS toolkit highlights the legally binding disaster response obligations that AMS have with each other and includes the AADMER and the ASEAN Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations (SASOP).[185]

UN in Malaysia

The United Nations Multi-Country Office for Malaysia, Singapore, and Brunei Darussalam is located in Putrajaya, Malaysia.[186] Malaysia has performed well on development criteria by having substantially reduced poverty, lowered child and infant mortality rates, achieved near universal primary and high secondary school enrollment, and achieved extensive public utility coverage. Accordingly, the UN Country Team for Malaysia supports achievement of SDGs relating to other areas, including improving nutrition to reduce the double burden of stunting and obesity, reducing income inequality, improving gender equality, and making progress toward climate change and environmental targets.[187]

There are 27 UN system entities that work in Malaysia, but those UN agencies that are resident in the country are more likely to be involved in disaster response. UN system agencies resident in Malaysia include the UN Development Programme (UNDP), UN Children's Fund (UNICEF), UNHCR, UN Population Fund (UNFPA), WHO, WFP, International Organization for Migration (IOM), UN University International Institute for

Global Health, and UN Department for Safety and Security. Among these, UNDP, UNICEF, UNHCR, UNFPA, WHO, WFP, and IOM are most likely to directly support crisis response efforts.

UN agencies feature prominently as global cluster leads during a humanitarian response. The previous section on the National Disaster Management System discussed Malaysia's national lead agencies in the cluster approach to humanitarian coordination. The cluster approach figure also depicted the UN agency or other international organization that serves as global lead for each cluster, thus would be active in that area in Malaysia and operate in support of the Malaysian government for humanitarian responses in the country. The global cluster lead is responsible for ensuring adequate response in the cluster within the international humanitarian community. The global cluster leads are:

- Early Recovery — UNDP
- Education — UNICEF & Save the Children
- Emergency Telecoms — WFP
- Food Security — WFP & the Food and Agriculture Organization (FAO, of the UN)
- Health — WHO
- Logistics — WFP
- Nutrition — UNICEF
- Protection — UNHCR
- Shelter — International Federation of Red Cross and Red Crescent Societies (IFRC) / UNHCR
- Water, Sanitation and Hygiene — UNICEF
- Camp Coordination and Camp Management — IOM / UNHCR[188]

Other Disaster Management Partners

National and international humanitarian organizations play a key role in supporting Malaysia's government-led DM policies and practices. A strong civil society within the country means that capable, internationally recognized national NGOs are active stakeholders. The entities within the International Red Cross and Red Crescent Movement also play crucial roles in national and regional preparedness, response, and recovery.

International Red Cross and Red Crescent Movement

Together, the International Committee of the Red Cross (ICRC), IFRC, and the 191 National Societies make up the International Red Cross and Red Crescent Movement. Collectively, these entities work together in a coordinated way on joint assessments, planning and reporting, establishment of a migration and displacement working group, and implementation of a migration and displacement plan of action.[189]

The Malaysian Red Crescent (MRC) is an auxiliary to the Malaysian Government for humanitarian action and disaster relief. It provides vital assistance during crises and works to promote community, health, and welfare services within local communities at all times. Its immediate disaster response functions include complementing government agencies' SAR operations and deploying staff from the national headquarters to support assessments and initial assistance to people affected by emergencies.[190] MRC's role in disaster response was further institutionalized in 2024 through its formal recognition in NADMA Directive No. 1, which designated MRC as a key support agency during national disasters.[191]

In line with its auxiliary role, MRC works closely with various government bodies, foremost among them NADMA. Other governmental bodies involved typically include the JKM and APM. MRC also supports the Ministry of Women, Family and Community Development with providing emergency medical services and delivering food, blankets, and clothing in relief centers. It supports the MOH in providing first aid, ambulance, medical and health services in relief centers, and infectious disease prevention and control. MRC also supports the MOH during non-emergency times by operating its flagship Emergency Ambulance Service and managing the national "999" emergency hotline.[192]

As of 2024, MRC has 159 branches, 78 staff, and 75,807 volunteers. It is led by a 19-member National Executive Board.[193]

In addition to its national work, MRC provides assistance internationally. Following

the March 2025 earthquake in Myanmar, MRC contributed 3 metric tons (3.3 tons) of humanitarian aid as part of a joint relief consignment of 15 metric tons (16.5 tons) coordinated by NADMA and sent to Myanmar. MRC's contribution – 100 kitchen sets, 200 hygiene kits, 1,085 sets of sanitary pads, 94 blankets, 348 mosquito nets, and other relief supplies – was delivered through the return flight of the SMART.[194]

MRC's vision is to be the leading humanitarian organization in Malaysia by building resilient and empowered communities to be prepared for and to mitigate health crises and other disasters. It is implementing Strategy 2030 in line with the global direction set by the IFRC for all National Societies. Strategy 2030 focuses on five strategic priorities (SP), which align with three goals, spelled out in Table 1.[195]

The MRC is part of the Malaysia, Singapore, and Brunei country cluster, which is supported by both the IFRC and ICRC.

The IFRC is the world's largest humanitarian network, comprising 191 National Red Cross and Red Crescent Societies that work to save lives and build community resilience. The IFRC Asia Pacific Regional Office is based in Kuala Lumpur, Malaysia. The IFRC supports the MRC to systematically strengthen its organizational and response capacities through an evidence-based approach that improves its ability to fulfil its humanitarian mandate. Since 2020, a dedicated team from IFRC's regional office has been embedded within the MRC at its national headquarters, where it provides strategic support. In recent years, the IFRC has supported the MRC through several Disaster Response Emergency Fund operations including flood responses in 2022-2023 and 2024-2025.[196]

The IFRC provided support to the MRC to establish connections with the MAF, and this relationship resulted in an invitation for the MRC to participate in an exercise by the Five Power Defence Arrangements — multilateral defense agreements established in 1971 among Australia, Malaysia, New Zealand, Singapore, and the United Kingdom to consult each other immediately upon threat or attack. IFRC provided technical guidance on engaging with MAF and preparing MRC for its involvement. The IFRC also facilitated MRC engagement with humanitarian agencies such as Medecins Sans Frontieres (Doctors Without Borders) Malaysia with a focus on support to coordinate delivery of health services to migrants.[197]

The ICRC supports the MRC as needed, with most work focusing on issues in Sabah state. The ICRC Regional Office in Kuala Lumpur closed in 2023, and work with Malaysia was downsized to a representational country mission under the ICRC's Bangkok Regional Delegation.[198] The ICRC and MRC established a 5-year partnership agreement, 2021-2026, to cooperate in the areas of migration, restoring family links, and the overall development of the National Society, including its role as auxiliary to public authorities.[199]

National Organizations

Humanitarian Care Malaysia (MyCARE) is a national non-profit that has built a regional and global network through its humanitarian relief work across Southeast Asia and into the Middle East. At home in Malaysia and abroad, it frequently participates in flood response by delivering food relief, finding or managing temporary shelters, and supporting home reconstruction and education.[200] Among the Rohingya refugee community in Malaysia,

SP 1: Climate and environmental crises **SP 2:** Evolving crises and disasters	**Goal 1** – People anticipate, respond to, and quickly recover from crisis
SP 3: Growing gaps in health and well-being	**Goal 2** – People lead safe, healthy, and dignified lives and have opportunities to thrive
SP 4: Migration and identity **SP 5:** Values, power, and inclusion	**Goal 3** – People mobilize for inclusive and peaceful communities

Table 1: Malaysian Red Crescent Strategy

MyCARE participates alongside government agencies and other international and national NGOs to support immunization drives, run learning centers, provide hygiene support, and deliver psychosocial wellbeing sessions.[201]

Islamic Relief is an independent, international, humanitarian aid and development organization founded in the United Kingdom in 1984. It has assisted more than 120 million people and has an active presence in over 45 countries. Their work covers emergency assistance, integrated sustainable development, DRR, and advocacy. Islamic Relief Malaysia was established in 2005 and was officiated by former Malaysian Prime Minister Mahathir Mohamad; its mandate is to continue the organization's work in the Asia-Pacific region.[202]

Malaysian Relief Agency (MRA) is a non-profit, humanitarian organization with the primary objective of assisting people affected by natural disasters or armed conflicts locally and abroad. In 2014, MRA received special consultative status from the UN Economic and Social Council; this status enabled MRA to participate in UN deliberations. In 2017, MRA was accepted as an Associate Member of the Federation of Islamic Medical Association. In 2023, MRA became a member of the Asian Disaster Reduction and Response Network. MRA has expanded to all 13 states in Malaysia.[203] In response to the December 2024 floods, MRA channeled more than MYR 429,000 (US$96,000) in disaster aid to 41 flood-affected areas in Pahang, Kedah, Kelantan, Terengganu, Johor, Melaka, and Perlis States.[204]

MERCY Malaysia is an international, non-profit NGO that provides medical relief, sustainable health-related development, and risk reduction activities for vulnerable communities in crisis and non-crisis situations. It was founded in 1999 by Dr. Jemilah Mahmood as the Malaysian Medical Relief Society in response to the conflict in Kosovo. It has since provided relief to more than 550,000 people in 35 countries, including active missions in 12 countries as of 2025. At home in Malaysia, it has assisted more than 28,000 evacuees affected by monsoon floods.[205] It has more than 500 members and 7,000 registered volunteers.

MERCY Malaysia was the first NGO in Asia to become a Type 1 Global Classified Team under the WHO initiative for Emergency Medical Teams (EMT). This recognizes that MERCY Malaysia's EMT is a self-sufficient team capable of deploying internationally to respond to health emergencies. The verification aims to ensure the timeliness and quality of health services provided by international EMTs in support of national health systems that are activating and coordinating rapid response capacities during disasters, outbreaks, or other emergencies. A Type 1 Fixed EMT classification enables MERCY Malaysia to provide acute trauma and non-trauma care, referrals and ongoing investigation or care, and community-based primary care in an outpatient fixed facility to reduce deaths and disabilities.[206]

Taiwan Buddhist Tzu Chi Foundation Malaysia was started by Tzu Chi followers who were working in Malaysia in 1989. Tzu Chi Malaysia is a charitable Buddhist organization that registered at the national level as an NGO in 1995. As of 2025, it operates 170 offices and contact points in all 13 states of Malaysia. There are an estimated 18,500 Tzu Chi volunteers in the country. The organization delivers aid to families, students, and refugees, and it is active in ecological activities.[207] Through its Emergency Aid program, Tzu Chi volunteers deliver relief items to affected families.[208] For example, during Klang Valley flooding in 2021, Tzu Chi volunteers were mobilized to support surveys of affected areas and to deliver food aid and non-food relief items to relief centers. As part of the recovery phase, volunteers participated in clean-up activities and delivered cash assistance to 16,000 families.[209]

CRITICAL INFRASTRUCTURE FOR DISASTER MANAGEMENT

Roadways are the main passenger and short-distance cargo transport mode in Malaysia. Railways carry the bulk of long-distance cargo. The country's international and domestic airports serve as gateways, and seaports also play a major role, handling the majority of the country's import-export cargo. As roads are the main transport mode, disaster responses rely on swift removal of debris and repairs. DM and technical agencies are also responsible for disaster communications, and these are covered by EWS and information sharing platforms. Malaysia's communications infrastructure provides widespread 4G network coverage and broadband internet connectivity. Nearly all Malaysians have access to electric power, and most Malaysians have access to safe water and sewerage services. In more remote areas, power, water, and sanitation infrastructure may be more exposed to hazardous conditions, and residents relying on these systems are more vulnerable to the health consequences of disruptions.

Transportation

The MOT is the federal-level authority responsible for planning and implementing policies for road, rail, maritime, and aviation transport, while the Ministry of Works (KKR) is responsible for operation and maintenance of federal roads. During a disaster response, KKR is also responsible for providing supplies, machinery, and workers to clean up disaster sites, including clearing roads and, accordingly, it supports NADMA in this endeavor as needed. All transport between Peninsular Malaysia and East Malaysia is via ship or air, the latter for particularly valuable freight. The National Transport Policy (2019-2030) is the guiding framework for boosting the productivity and safety of the entire transport network, across road, rail, air, and maritime sectors.[210] Malaysia's airports, seaports, extensive road network, and railways are all likely to be used as key nodes during disaster response efforts.

Airports

Malaysia is served by six international airports located across the country, and Kuala Lumpur International Airport (KLIA) is one of Southeast Asia's major aviation hubs. There is also a modern, fully equipped network of domestic airports. There are a total of around 100 airports and 24 heliports (2025) across the country;[211] 18 of the airports are short take-off and landing ports – STOLports.[212]

The Aviation Division of the MOT plans and develops policies on aviation safety and security, while the Civil Aviation Authority of Malaysia (CAAM) has the primary function to regulate the safety and security of civil aviation in the country. CAAM oversees five divisions, of which the Air Traffic Management Division is responsible for providing air traffic control services and ensuring flight operations remain safe and efficient; it provides air traffic control and SAR.[213] Malaysia Airports Holdings Berhad (MAHB) is one of the country's major airport operators. It oversees 39 airports, including 5 international airports, 16 domestic airports, and the 18 STOLports.[214]

Air cargo facilities are well developed, particularly in Malysia's international airports. For example, KLIA has an annual capacity of more than 1.2 million tons of cargo. Of the six international airports, KLIA, Penang, Langkawi, and Senai are in Peninsular Malaysia, while Kota Kinabalu is in Sabah and Kuching in Sarawak, both in East Malaysia. MASkargo is the main cargo division of its parent company Malaysia Airlines; it operates scheduled, chartered air cargo services, ground handling services, and airport to seaport cargo logistics. MASkargo also operates a state-of-the-art Advanced Cargo Centre at KLIA. The company has a product called I-Port, the world's first airport within a seaport trans-shipment service,

which allows efficient handling of sea and air cargo shipment through KLIA from Port Klang.[215]

Key Airports

Kuala Lumpur International Airport

KLIA is one of Southeast Asia's major aviation hubs, located in the Sepang District of Selangor, some 50 km (31 mi) from Kuala Lumpur. There are more than 100 international and over 40 domestic routes operated from the airport. KLIA has three runways of about 4,000 m (13,123 ft) in length. The airport is well connected to the rest of Peninsular Malaysia by the country's road network and is connected by high-speed train to Kuala Lumpur. KLIA is equipped to handle the Airbus A380, the world's largest passenger aircraft. The airport's total footprint covers some 100 km^2 (39 mi^2). The terminal floor area is 737,249 m^2 (7,935,682 ft^2). KLIA's main terminal has 46 contact and 38 remote stand aircraft bays, and its capacity is 25 million passengers per annum (mppa). KLIA2 has a terminal capacity of 45 mppa, and it has 68 contact and eight remote stand aircraft bays.[216]

Kota Kinabalu International Airport

Kota Kinabalu International Airport is the second busiest airport in Malaysia. It is located 8 km (5 mi) from the city of Kota Kinabalu in Sabah state and is the main gateway into Sabah and Borneo. The airport has a single runway with five aerobridges and three additional parking stands. It is equipped to handle large aircraft like the Boeing 747 and the Airbus A380 and has a capacity of 9 mppa.[217]

Kuching International Airport

Kuching International Airport is located around 11 km (6.8 mi) south of Kuching, Sarawak. It serves as a gateway to the states of Sarawak and Sabah and to neighboring Brunei. The terminal is capable of handling 5 mppa and is the fourth busiest airport. It can accommodate Airbus A380 and Boeing 747 aircraft. The airport also serves as an RMAF base. It has 12 aircraft bays.[218]

Subang Air Base

Subang Air Base, operated by the RMAF, has notably been used as a logistics hub to support past relief missions. It shares runway facilities with Sultan Abdul Aziz Shah Airport. Established in 1985, and strategically located near the capital, it is the main hub for large transport aircraft like the C-130 and A400M. The base routinely handles logistical flights for regional disaster responses.[219]

Adjacent to the RMAF Subang Air Base and Sultan Abdul Aziz Shah Airport is the regional UNHRD hub. Globally, the UNHRD is a network that procures, stores, and transports relief supplies for the international humanitarian community. The hubs pre-position relief items and equipment for rapid deployment during an emergency.[220] During the 2004 Indian Ocean earthquake and tsunami response, Malaysia hosted a UNHRD staging area to store and dispatch relief items to affected areas. Based on this experience, the WFP expanded the UNHRD network to include Kuala Lumpur as one of its hubs in 2012. The hub has warehouse facilities and space for training and workshops; there are 9,980 m^2 (107,423 ft^2) of covered space and 2,000 m^2 (21,527 ft^2) of open storage.[221]

Tables 2 and 3 provide details of Malaysia's international and major domestic airports.[222]

Seaports

Maritime transport plays an important role in Malaysia's economy, with roughly 90% of the country's cargo handled through the sea. The Strait of Malacca, an important and strategic waterway connecting the Indian Ocean and the South China Sea, runs between the Indonesian island of Sumatra and Peninsular Malaysia. Port Klang, Penang Port, and the Port of Tanjung Pelepas (PTP) are located along the Strait.[223] According to the MOT, Malaysia was the world's 5th largest container-handling country in 2024.[224] Malaysia has 35 ports, comprising 3 large ports, 4 medium ports, 10 small ports, and 18 very small ports. Twenty-four of Malaysia's ports include oil terminals.[225]

Airport	IATA/ ICAO Code	Nearest City	Elevation	Runway Length / Width	Runway Surface
Kuala Lumpur International Airport (KLIA)	KUL / WMKK	Kuala Lumpur – 50 km (31 mi)	21 m (69 ft)	1: 4,124 × 60 m (13,530 × 197 ft) 2: 4,050 × 60 m (13,288 × 197 ft) 3: 3,960 × 60 m (12,993 × 197 ft)	1: Asphalt 2: Asphalt 3: Paved
Kota Kinabalu International Airport	BKI / WBKK	Kota Kinabalu – 8 km (5 mi)	3 m (10 ft)	2,987 × 46 m (9,800 × 150 ft)	Asphalt
Kuching International Airport	KCH / WBGG	Kuching - 11 km (7 mi)	27 m (89 ft)	2,454 × 46 m (8,051 × 151 ft)	Asphalt
Langkawi International Airport	LGK / WMKL	Kuah – 16 km (10 mi)	9 m (29 ft)	3,810 × 45 m (12,500 × 148 ft)	Asphalt
Penang International Airport	PEN / WMKP	Georgetown – 16 km (10 mi)	3 m (11 ft)	3,353 × 46 m (11,000 × 150 ft)	Asphalt
Senai International Airport	JHB / WMKJ	Johor Nahru - 23 km (14 mi)	41 m (135 ft)	3,800 × 46 m (12,467 × 150 ft)	Asphalt

Table 2: Codes and Runway Lengths for Malaysia's International Airports

Airport	IATA/ ICAO Code	Nearest City	Elevation	Runway Length / Width	Runway Surface
Bintulu Airport	BTU / WBGB	Bintulu – 20 km (12 mi), Sarawak	23 m (74 ft)	2,745 × 45 m (9,005 × 148 ft)	Asphalt
Labuan Airport	LBU / WBKL	Labuan – 2 km (1.24 mi), Federal Territory of Labuan	31 m (101 ft)	2,300 × 45 m (7,546 × 148 ft)	Asphalt
Lahad Datu Airport	LDU / WBKD	Lahad Datu – 1 km (0.6 mi), Sabah	14 m (45 ft)	1,371 × 30 m (4,498 × 98 ft)	Asphalt
Limbang Airport	LMN / WBGJ	Limbang – 6 km (3.7 mi), Sarawak	4 m (14 ft)	1,500 × 30 m (4,922 × 98 ft)	Asphalt
Melaka Airport	MKZ / WMKM	Melaka – 10 km (6.2 mi), Malacca	11 m (35 ft)	1,372 × 45 m (4,501 × 148 ft)	Asphalt
Miri Airport	MYY / WBGR	Miri – 10 km (6.2 mi), Sarawak	18 m (59 ft)	2,745 × 60 m (9,006 × 197 ft)	Asphalt
Mukah Airport	MKM / WBGK	Mukah 8.2 km (5 mi), Sarawak	6 m (20 ft)	1,500 × 30 m (4,921 × 98 ft)	Asphalt
Mulu Airport	MZV / WBMU	Mulu Town – 2.4 km (1.5 mi), Sarawak	24 m (79 ft)	1,500 × 30 m (4,921 × 100 ft)	Asphalt
Sandakan Airport	SDK / WBKS	Sandakan – 13 km (8 mi), Sabah	14 m (46 ft)	2,134 × 46 m (7,000 × 151 ft)	Asphalt
Sibu Airport	SBW / WBGS	Sibu – 22.5 km (14 mi), Sarawak	37 m (122 ft)	2,745 × 45 m (9,006 × 148 ft)	Asphalt
Sultan Abdul Aziz Shah Airport / Subang Air Base (shared runway)	SZB / WMSA	Subang – 24 km (15 mi), Selangor	27 m (90 ft)	3,780 × 45 m (12,401 × 148 ft)	Asphalt
Sultan Abdul Halim (Alor Setar) Airport	AOR / WMKA	Alor Setar – 13 km (8 mi), Kedah	5 m (15 ft)	2,745 × 46 m (9,005 × 151 ft)	Asphalt
Sultan Ahmad Shah (Kuantan) Airport	KUA / WMKD	Kuantan – 15 km (9.3 mi), Pahang	18 m (58 ft)	2,743 × 45 m (8,999 × 148 ft)	Asphalt
Sultan Azlan Shah Airport (Ipoh)	IPH / WMKI	Ipoh – 6 km (3.7 mi), Perak	40 m (130 ft)	1,798 × 36 m (5,900 × 121 ft)	Asphalt
Sultan Ismail Petra Airport (Kota Bharu)	KBR / WMKC	Kota Bharu – 8.6 km (5.3 mi), Kelantan	5 m (16 ft)	2,400 × 46 m (7,874 × 150 ft)	Asphalt
Sultan Mahmud Airport (Kuala Terengganu)	TGG / WMKN	Kuala Terengganu – 15 km (9.3 mi), Terengganu	6 m (21 ft)	3,480 × 46 m (11,417 × 150 ft)	Asphalt
Tawau Airport	TWU / WBKW	Tawau– 31 km (19.3 mi), Sabah	17 m (56 ft)	2,685 × 47 m (8,809 × 155 ft)	Asphalt

Table 3: Codes and Runway Lengths for Malaysia's Major Domestic Airports

Malaysia's seven main federal ports, overseen by dedicated port authorities are Port Klang, Johor Port, PTP, Kuantan Port, Penang Port, Bintulu Port, and Kemaman Port. Ports in Sabah and Sarawak fall under the jurisdiction of their respective State Governments, except Bintulu Port and Labuan Port, which are federally administered. Operations at nine major ports have been privatized – Penang Port, Teluk Ewa Port, Port Klang, Tanjung Bruas Port, Kuantan Port, Kemaman Port, Johor Port, PTP, Bintulu Port, and Labuan Port.[226] Port Klang and PTP are ranked among the top 20 container ports in the world. Port Klang has been made the national load center and the transshipment center. PTP has been recognized as a regional transshipment hub.[227]

Key Ports

Port Klang

Port Klang is Malaysia's largest and busiest seaport and serves as the main gateway for cargo entering and leaving the country. It is in Selangor on the west coast of Peninsular Malaysia, along the Strait of Malacca. It is 6 km (3.7 mi) from Klang town and some 40 km (25 miles) from Kuala Lumpur. Port Klang's throughput in 2022 was 13.2 million Twenty-Foot Equivalent Units (TEU). It is managed by the Port Klang Authority, which was established in 1963.[228]

The port's three terminals are Northport, Southport, and Westport. It is also the location of the Port Klang Free Zone and several industrial parks. Port Klang is easily accessible to major highways and is well connected to other key industrial areas.[229] The planned East Coast Rail Link (ECRL) project will connect Port Klang to Kota Bharu and then link to key rail stations across Peninsular Malysia, bridging the east and west coasts.[230]

Northport is a multipurpose terminal handling containers, bulk liquids, and general cargo, and it has specialized facilities to handle timber.

- Container Wharf: 2.6 km (1.6 mi) quay length, 11 berths, 33 quay cranes, and 174 prime movers
- Conventional Wharf: 1.5 km (.93 mi) quay length
- Vehicle Transit Centre: Annual capacity of 210,000 units
- Container Yard: 919,740 m^2 (9.9 million ft^2), 5.6 million TEU capacity
- Warehousing: 260,128 m^2 (2.8 million ft^2) warehouse space[231]

Westport is a deepwater terminal featuring advanced logistics and automation.

- Container Wharf: 5.8 km (3.6 mi) straight-line quay, 17.5 m (57.4 ft) draft, 66 quay cranes, 14 million TEU capacity[232]

Southport has eight berths (1 to 7A), with varying depths to accommodate various ships. The facility also features eight warehouses and multipurpose yards with a total space of 53,000 m^2 (580,487 ft^2).[233]

According to the MOT, Wesports' infrastructure development projects include the expansion of new terminals (CT10 and C17) that are expected to double capacity to 28 million TEUs by 2028. At Northport, upgrades to Berth 9 and other facilities support larger vessel operations and increased handling volumes.[234]

Port of Tanjung Pelepas

PTP is in Iskandar Puteri, Johor Bahru District, at the southern-most tip of Peninsular Malaysia, across the narrow Johor Strait from Singapore. PTP specializes in containerized cargo. Equipped with modern facilities, PTP has become an important transshipment container facility linking Malaysia with other global shipping routes through Singapore and Indonesia. PTP features 14 container deep-water berths that are designed to handle some of the largest container ships. For storage, PTP has a 117-hectare (290-acre) yard.[235] PTP recorded a throughput of 12.25 million TEUs of containers in 2024.[236]

Johor Port

Johor Port (also known as Pasir Gudang Port) is located at the southern tip of Peninsular

Malaysia and is a key regional logistics hub. Its primary focus is to serve petrochemical and bulk industries. It has a large storage facility and handles a variety of conventional cargo, dry and liquid bulk such as chemicals, electronics, furniture, packaged foods, and liquified natural gas (LNG). It plays an important role in regional trade, connecting Malaysia with Singapore and Indonesia due to its location near the Singapore Strait. Johor Port is also known to be the world's largest palm oil terminal with a storage capacity of 460,000 metric tons (507,063 tons). The port is connected by its own railway station to the national railways and thus on to neighboring countries. The port has three berths with a total length of 730 m (2,395 ft) and a depth of 13.5 m (44.3 ft). It also has 9,600 m^2 (103,333 ft^2) of container freight station facilities.[237]

Penang Port

Penang Port is a major port located on the northwest coast of Peninsular Malaysia. Due to its location, it allows for the easy facilitation of goods between the northern region of Malaysia and southern Thailand. It is Malaysia's third busiest port and handles a significant portion of exports including containerized goods, break-bulk, and dry cargo like timber and rubber. For imports, it deals mainly with petroleum goods, iron, and food products. The port is equipped with six container terminals, including five in Seberang Perai and one in George Town. It also has a large storage space that exceeds 200,000 m^2 (2,152,782 ft^2). Annually, it can handle more than 1 million TEUs of containers. The port also has a passenger terminal through the Swettenham Pier.[238]

Bintulu Port

Bintulu Port is in Sarawak, East Malaysia, near the city of Bintulu, and it is the main seaport to East Malaysia. The deepwater port is a key export hub for LNG as it is located near Malaysia's LNG plants. The multipurpose port can manage a range of cargo including timber, palm oil, crude oil, and fertilizer. It has modern facilities for handling containers and liquid and dry bulk cargo. It has a capacity of more than 62.5 million metric tons (69 million tons) of cargo and more than 390,000 TEUs of containerized cargo annually. It has three berths for handling conventional cargo and two additional berths for handling bulk and break-bulk cargo, as well as seven jetties for LNG tankers and a container terminal.[239]

Kuantan Port

Kuantan Port is located on the east coast of Peninsular Malaysia at Tanjong Gelang, on the South China Sea. It consists of Kuantan Port 1 and New Deep-Water Terminal, which is designed to accommodate larger ships. The multipurpose port handles a variety of cargo – liquid bulk, dry bulk, break-bulk, and containerized. Industrial cargo is the primary cargo, with a focus on exports of iron and steel products. The port consists of container berths, liquid chemical handling facilities, multipurpose berth facilities, and berths specifically for palm and mineral oil. It is operated by Kuantan Port Consortium.[240]

Labuan Port

Labuan Port is a naturally sheltered port, located on Labuan Island in East Malaysia near the South China Sea. It is an important transshipment hub for Brunei and the states of Sabah and Sarawak. Labuan is a free trade zone, which allows the port to cater to international shipping and trade with reduced tariffs. The port specializes in handling oil and gas products. It is also equipped to handle dry and liquid bulk, containers, and offshore and break-bulk cargo. The port features open storage of about 15,600 m^2 (167,917 ft^2), two warehouses, and a container yard. The port also has a yard measuring 10,000 m^2 (107,639 ft^2) and several warehouses outside the port. It is operated by the Labuan Liberty Port Management.[241]

Roads

Low-lying areas throughout the country are prone to flooding during heavy rain events. Roadways become impassable due to flash floods and standing water in some areas, including in urban centers. Meanwhile,

landslides are common, and they have historically caused disruption to overland transport as they blocked roadways or damaged bridges.

The KKR's role is to plan and implement federal-level infrastructure development and to plan and oversee maintenance of federal assets, including roads.[242] During a disaster response, KKR's role overseeing roads and public facilities means it is responsible for providing supplies, machinery, and workers to clean up disaster sites, including clearing roads. As such, it is an agency supporting NADMA's disaster operations commander in charge of relief and rehabilitation. KKR can be supported by or deliver support to MAF for clearing roads.[243]

Roads are the dominant means of passenger and cargo transport, and there are more than 38.7 million registered vehicles in a country of just over 34 million people.[244] More than 90% of all vehicles are light-duty cars, trucks, and two-wheelers.[245] Roads have long carried more freight-kilometers than the country's rail network, and this reliance on trucking of commercial and commodity cargo is a major factor in traffic congestion and declining road conditions. Integration of road and rail through multi-modal hubs continues to develop.[246]

As of 2019, the country's national road inventory stood at nearly 240,000 km (150,000 mi).[247] In 2021, the KKR reported that there were 20,039 km (12,450 mi) of federal roads,[248] which comprise the numbered roads that connect state capitals to each other and to international borders. An additional set of privately built and maintained toll roads deliver inter-city connectivity.

State governments are responsible for developing and maintaining state roads, which provide connectivity within a state. Residential and rural roads are under local authorities' oversight,[249] and as of 2023, an estimated 85% of the rural population had access to all-season roads.[250]

Railways

Rail provides the backbone for longer-distance inter-city freight movement, especially between seaports and commercial centers. As the world has shifted to containerized cargo in recent decades, Malaysian businesses have also begun to shift, and the country's rail transporters are developing more container handling capacity. Nonetheless, there remain some shortcomings as road-rail connections for last-mile delivery are sometimes insufficient.[251]

Ownership and management of the country's rail lines fall to the Railway Assets Corporation under the MOT. Railway operations are handled by a separate, state-owned enterprise, Keretapi Tanah Melayu Berhad.[252]

There are some 2,000 km (1,250 mi) of rail lines serving the country's major industrial and shipping hubs. There are also nearly 1,000 km (620 mi) of light passenger rail lines in urban areas.[253]

Electric and non-electrified trains connect various cities in Peninsular Malaysia. An electrified double track runs from Gemas in the south to Padang Besar in the north and serves various cities along the western side of the Peninsula. Diesel lines connect Tumpat in the north to Johor Bahru in the south via Gemas. The Tumpat - Johor Bahru line is single track and cuts through the center of the Peninsula.[254]

By 2026, the 640-km (49-mi) ECRL is set to be operational; it links the ports of Kota Bharu (Kelantan, east coast) and Port Klang (Selangor, west coast). Travel time between the coasts on this passenger and freight service will be approximately four hours.[255]

In Sabah, a single 134-km (83-mi) track serves 15 stations in the greater Kota Kinabalu area.[256]

Navigable Waterways

Many of Malaysia's villages, towns, and cities are built along riverbanks, and many communities have a history of using rivers as transport arteries. However, only in Sarawak do rivers retain a significant role in large-scale passenger and cargo transport.

There are nearly 3,000 river basins across Malaysia. Of the 189 basins considered "major," 74 are in Peninsular Malaysia, 75 in Sabah, and 40 in Sarawak.[257] On the Peninsula, road and rail

long ago eclipsed river transport due to the short distances covered by Peninsular Malaysia's navigable rivers.[258] Without large-scale cargo-handling terminals, much of the country only uses rivers for individual or urban, commuter trips, but in Sarawak, people and goods move over 3,300 km (2,050 mi) on 55 navigable rivers.[259]

The Sarawak Rivers Board under the State Ministry of Transport is tasked with planning and regulating river transport systems and protecting the riverine ecosystems, including through maintaining navigation aids and passenger or freight terminals and preventing and remediating riverbank damage, among other responsibilities.[260]

The Sarawak Inland Water Transport System includes passenger and cargo facilities along major rivers and their tributaries. The Rajang is the single largest and most important of the rivers served. With a total length of 492 km (306 mi), 130 km (80 mi) is navigable by ocean-going vessels (less than 4-m [13-ft] draft) from the Tanjung Manis Anchorage up to Sibu, and another 160 km (100 mi) is navigable by shallow-draft craft. The remainder of the Rajang's length is navigable only by small canoes.[261]

Communications

Malaysia's NADMA, and other DM and technical agencies are responsible for disaster communications and the dissemination of hazard warnings for the public. EWS address multiple hazards such as floods, landslides, earthquakes, and tsunamis. While weather and tsunami alerts are well established, Malaysia continues to strengthen early warning for other hazards, particularly the national flood warning system. Other warning systems such as those for earthquakes and landslides remain in a localized or pilot phase. The public receives information through a wide variety of media, including social media, broadcast TV and radio, the internet, and phone calls or text messages. Malaysia shares disaster information with other AMS through ASEAN's regional information platforms.

Early Warning Systems and Information Sharing

Malaysia's DM authorities have prioritized the development of disaster communications, information sharing platforms, and EWS. Authorities maintain and disseminate current hazard information through a variety of official government websites, with many webpages available in both Bahasa Malaysia and English. Per Malaysia's own reporting to the UNDRR Sendai Framework Monitor, the country has reached targets for establishing a multi-hazard monitoring and forecasting system and for the percentage of local governments with a plan to act on early warnings. It has made substantial progress but continues to work toward the target of people per 100,000 covered by local or national EWS notifications.[262] A 2024 UNDRR-World Meteorological Organization (WMO) report on the status of MHEWS notes that collaboration between state scientific and technical agencies, academia, and the private sector has improved in Malaysia.[263]

NADMA and other government agencies collect and exchange information through the NDCC. NADMA and technical agencies such as the Department of Irrigation and Drainage (DID) are among several government agencies with oversight over technical data that can inform early warnings. Moreover, Malaysia and other AMS share information networks that allow them to exchange details on disaster response and humanitarian need. The country has implemented processes and procedures to ensure systems are continuously monitored and assessed.[264]

The national meteorological and hydrological service is Malaysian Meteorological Department (MET Malaysia), under the Ministry of Natural Resources and Environmental Sustainability. It manages weather, climate, and geophysical data and information and shares them among other national and regional stakeholders. Among other offices, the Operational Branch of MET Malaysia oversees the National Weather and Earthquake Operation Centre and the Technical Earthquake and Tsunami Division.[265] Under the agency sits the National Earthquake and

Tsunami Operations Centre, which receives data from 80 seismic stations nationwide and an additional 323 stations internationally.[266] MET Malaysia delivers not only daily forecasts and bulletins but also longer-term climate and geophysical research.[267]

Beyond NADMA and technical scientific agencies, the MCMC has specific DM-related responsibilities, based on NADMA Directive No. 1. They are:

- Ensure availability of network facilities and services, communication, and ongoing maintenance and regulation throughout the duration of DM, including SAR operations
- Ensure availability of network facilities and communication services for the NDCC
- Ensure availability of network facilities and alternative telecommunications services for use by response agencies during any disruption of communication service coverage caused by the failure of disaster telecommunications infrastructure operations
- Ensure provision of advisory services and maintenance by communication service providers for access and communication devices used during DM activities
- Coordinate with telecommunications companies to disseminate disaster warnings to the public
- Carry out post-disaster tasks[268]

Government Agencies

NADMA: As the lead DM agency, NADMA works with various technical agencies and shares a wide variety of weather and hazard information and alerts through multiple channels, including its official website, portalbencana, as well as SMS, fax, phone calls, and mass and social media platforms. NADMA operates the 24-hour NDCC, which monitors information and data received from the country's technical agencies to support identification of and early warning for natural hazards. It also provides disaster data through its website.[269]

MET Malaysia: MET Malaysia is the government agency responsible for meteorology, climate, and geophysical services. It provides weather news and alerts as well as earthquake and tsunami information to the public. Core functions include increasing the effectiveness of weather services and strengthening climate, earthquake, and tsunami services.[270] MET Malaysia's "myCuaca" app is one official government meteorological interface for the public. The app, which was launched in 2015 and provides weather information and warnings and critical information on earthquake and tsunami events.[271]

DID: Under the Ministry of Energy Transition and Water Transformation (PETRA), DID plays a critical role in managing the country's flood risk through monitoring, forecasting, and early warning to provide timely information and alerts to the public. The DID maintains a website with active flood warnings, and it offers the option to register to receive flood alerts for each region. Information is available through its Public Infobanjir website. Under the DID, the National Flood Forecasting and Warning Centre (PRABN) is responsible for national flood forecasting and early warning. Its functions include developing, upgrading, and maintaining flood forecast and warning systems and carrying out public awareness activities related to flood forecasting and warning.[272]

Malaysia Minerals and Geoscience Department (JMG): The JMG falls under the Ministry of Natural Resources and Environmental Sustainability. It monitors, assesses, and reports on geophysical hazards, such as landslides and earthquakes, and it identifies areas prone to potential risks.[273] It has responsibility for investigation, mapping, assessment, and management of natural resources and the risk of geological disasters.[274] JMG also provides geohazard maps and information to relevant authorities and the public. The department works with MET Malaysia on seismic issues to provide comprehensive information to the public.[275]

MCMC: In addition to explicit DM-related communications tasks, MCMC is working on a special disaster notification system for mobile phones – the cell broadcast system – that does not use telecom-based SMS infrastructure. The system is being developed to provide faster and more precise alerts and will also allow MCMC to send location-based push notifications to mobile phones.[276] In addition, through MCMC, the government launched the Mobile Integrated Radio and Internet Communication System (PRIME), based on a vehicle equipped with a range of communications technologies - satellite, cellular, two-way radio, Wi-Fi, and drones. When an emergency strikes, PRIME vehicles can provide mobile radio and internet access to ensure responders can still coordinate and communicate effectively.[277] The first unit launched in June 2025 and is stationed at MCMC's headquarters to support relief operations in Peninsular Malaysia. A second unit was launched at the MCMC office in Sabah in September 2025. The third unit will be deployed at the MCMC office in Sarawak and is expected to be completed by the end of 2025.[278]

Department of Environment: Under the Ministry of Natural Resources and Environmental Sustainability, the Department is responsible for monitoring of the environment, including air quality and haze, open burning and hotspot monitoring, and water and marine management.[279]

Systems and Platforms

Malaysia Emergency Response Services (MERS) 999: The "999" emergency number connects callers throughout Malaysia to five emergency services agencies - police, fire and rescue, MOH, the Malaysian Maritime Enforcement Agency, and civil defense. While most of the resources mentioned in this section support government informing the public about hazards, this hotline number is the main means for individual members of the public to notify authorities about an emergency – large or small. MERS 999 is a single platform that channels calls to the appropriate service, and it can also offer information immediately to callers to assist them in seeking shelter or safety.[280]

Disaster Information Management System "MyDIMS": MyDIMS is a portal utilized by the NDCC. It provides a space to collect disaster information and real-time disaster warnings from Malaysia's various technical agencies. The system allows data, warnings, and reports to be accessed through the NADMA disaster portal. MyDIMS includes data on current disaster events such as the type, location, number of affected, and number of evacuation centers. The system also enables the NDCC to produce disaster reports.[281]

Kuala Lumpur Multi-Hazard Platform: The Kuala Lumpur Multi-Hazard Platform (KL–MHP) is a forecasting tool developed by the University of Cambridge, Universiti Kebangsaan Malaysia's Southeast Asia Disaster Prevention Research Institute, MET Malaysia, and other academia, government, and industry partners. It is a web-based system that provides forecasts of rainfall, temperature, and wind speed, as well as hazards such as flash floods, landslides, heatwaves, air pollution, and strong winds. The Platform provides a 3-day forecast for rainfall, temperature, and air pollution and combines these data with information on areas susceptible to hazards such as landslides and flooding to create a hazard map for planners, decision-makers, and responders. The system has been deployed by the City Hall of Kuala Lumpur.[282]

EWS for Specific Hazards

Tsunami - The National Tsunami Early Warning System (Sistem Amaran Awal Tsunami National Malaysia, SAATNM) is managed by MET Malaysia. It provides early warning of a potential tsunami occurrence over the Indian Ocean, South China Sea, and the Pacific Ocean.[283] It integrates regional and global seismic data and is equipped with a processing system, which can deliver earthquake

information to DM stakeholders and the public. MET Malaysia then uses a variety of platforms to broadcast tsunami warnings to the public; they include SMS, telephone, fax, social media, websites, TV crawlers, press statement, the "myCuaca" app, and tsunami sirens.[284]

As of 2025, MET Malaysia reported that it could deliver a tsunami warning to relevant agencies and the public within eight minutes of detecting the seismic trigger. Technical upgrades that were underway are expected to reduce that time to six minutes by 2026.[285] MET Malaysia maintains 53 tsunami sirens across all coastal areas of the country.[286] In 2024, the agency began a project to upgrade tsunami sirens nationally. By late 2025, it will have upgraded 23 tsunami sirens across nine states. The new sirens have 3-km (1.8 mi) range, larger than the decade-old sirens they are replacing.[287]

SAATNM is an integral part of the Indian Ocean Tsunami Early Warning System and the Northwest Pacific Tsunami System, coordinated by the Intergovernmental Oceanographic Commission (IOC) and UN Educational, Scientific and Cultural Organization. As part of the IOC Tsunami Network, Malaysia has also established linkages with the U.S. Pacific Tsunami Warning Centre and the Japan Meteorological Agency.[288] Malaysia is also one of 27 member states in the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS), which coordinates international efforts in tsunami warning and mitigation within the Indian Ocean region. Malaysia belongs to one inter-governmental coordination group in the ICG/IOTWMS and is advised by its Tsunami Information Centre.[289]

Flood – There is a nationwide flood warning system being developed – the National Forecasting and Warning Program (PRAB), launched in December 2014 under the DID's PRABN. The PRAB is expected to be implemented throughout the country with flood prediction models in 41 major river basins. PRAB is focused on four objectives: 1) developing a system capable of forecasting floods seven days in advance; 2) enhancing both the warning capacity and dissemination reach of current warning systems from six hours to two days; 3) improving flood forecast accuracy; and 4) creating a system to alert the public of flash floods 1-3 hours in advance.[290] PRAB relies on hydrological detection systems, which involve collecting data on rainfall, river levels, water discharge, and soil moisture from monitoring stations.[291]

Additionally, there are several local area flood warning systems. In 2024, localized flood forecasting and EWS were installed in the Kuala Lumpur area. The project consists of 33 small solar-powered, energy efficient speakers at select locations.[292] Another flood EWS was installed at the National Elephant Conservation Centre, Kuala Gandah, in 2021. The system allows the DID to send multi-lingual warnings of potential flood threats to park visitors.[293]

Flood alerts are generally disseminated by warning siren, SMS, telephone, and fax.[294] Flood alert information is also disseminated by the DID through its official Public Infobanjir site: *https://publicinfobanjir.water.gov.my/ramalan/amaran-banjir/?lang=en*. Public Infobanjir is a centralized database system that collects real-time rainfall water level data from hundreds of hydrological stations across Malaysia. The portal is refreshed every 15 minutes, and data are available to the public and shared directly with NADMA through the NDCC. Currently, the system can provide flood forecasting information two days before flood events in select locations. The website displays information interactively for the user, combining location maps and lists of areas expected to flood.[295] Additionally, users can register for flood warning announcements and be contacted via mobile phone or email. The flood warning service is currently only available for the Kelantan, Terengganu, and Pahang River basins.[296]

Malaysia is a contributor and participant in the Southeastern Asia-Oceania Flash Flood Guidance (SAOFFG) System (*https://ffgs.bmkg.go.id/alert/*), hosted by Indonesia's Agency for Meteorology, Climatology and Geophysics in Jakarta.[297] This participation allows MET Malaysia and the DID to both share data

regionally and access analytical systems to promote better flood forecasting.

Landslide – In 2022, a national pilot project for a landslide EWS was launched at Titi Hayun, Yan, Kedah, as a collaboration between the JMG and Universiti Teknologi Malaysia using technology from Japan. The main objective of the pilot project is to reduce the risk of a geological disaster in Jerai Geopark's tourist area, which suffered a deadly slide in August 2021.[298] Another landslide EWS project was installed at three districts in the state of Pahang – Cameron Highlands, Raub, and Bentong; it uses wireless monitoring technology.[299]

Fire – In 2023, Malaysia set up an early warning monitoring and fire prevention system, the Fire Danger Rating System, which assesses the risk of fires up to a week in advance. The system was set up to aid Malaysia and its nearby ASEAN neighbors (Brunei, Indonesia, Singapore, and Thailand) because of the history of fires and transboundary haze in the region. The system was built to use satellite data from 459 ASEAN weather stations from the Global Telecommunication System,[300] which began to transition to the WMO Information System in January 2025; the transition is slated to be complete by 2033.[301] The system can reportedly differentiate if heat comes from an industrial area, an oil and gas well, or burning vegetation.[302]

The Malaysian Space Agency has developed an online Forest Fire Information System (ForFIS) that has been operational since 1 June 2011. The system aims to disseminate information on forests and open fire hotspots and cross-border haze using multi-resolution satellites. Agencies that have adopted this system include the Department of Environment, JBPM, Forestry Department of Peninsular Malaysia, and Department of Civil Defence Malaysia.[303]

Information Sharing Focal Points

No single entity can have all the information needed by stakeholders responding to an emergency. Sharing information among technical agencies, coordinating authorities, and implementing partners both in-country and among potential responders promotes timely, efficient, and effective delivery of disaster relief. The following are some focal points within Malaysia, in the wider region, and around the world that have and share data and information regarding the hazards that impact Malaysia's communities.

National Offices

National Disaster Management Agency (NADMA)

Prime Minister's Department
Level B1, 6 and 7, Setia Perkasa 5
Setia Perkasa Complex
Federal Government Administrative Centre
62502 WP Putrajaya
Tel: 603 8870 4800
Fax: 603 8870 4848
Email: *admin@nadma.gov.my*
Web: *https://www.nadma.gov.my/bi/*
Facebook: nadma.pmd
Instagram: nadma_malaysia
X: @mynadma

Meteorological Department of Malaysia (MET Malaysia)

Jalan Sultan,46667
Petaling Jaya, Selangor
Darul Ehsan
Tel: 03 7967 8000 / 8200
Hotline: 1 300 22 1638
Fax: 03 7955 0964
Email: *mmd@met.gov.my*
Web: *https://www.met.gov.my/*
Facebook: malaysiamet
Instagram: metmalaysia
X: @metmalaysia
YouTube: METMalaysia4

Department of Irrigation and Drainage (DID) and National Flood Forecasting and Warning Centre (PRABN)
Persiaran Rimba Permai, Cyber 8,
63000 Cyberjaya, Selangor
Tel: 603 8862 9200 or 603 8682 9300
Email: *pro@water.gov.my*, or *web@water.gov.my*
DID Web: *https://www.water.gov.my/index.php*
PRABN Web: *https://publicinfobanjir.water.gov.my/mengenai-kami/prabn/?lang=en*
Facebook: publicinfobanjir
X: @DID_Malaysia
Instagram: jps_malaysia

Malaysian Red Crescent Society (MRCS)
National Headquarters Complex
Lot PT54 Section 69 Jalan Lengkok Belfield
Off Jalan Wisma Putra
50460 Kuala Lumpur
Tel: 60 3 2143 8122 / 2144 9227 / 2143 6122 / 2143 7122
Email: *secgen@redcrescent.org.my*
Web: *https://redcrescent.org.my/*
Facebook: MalaysianRC
X: @MalaysianRC
Instagram: malaysianredcrescent
YouTube: @MalaysianRedCrescent

International Agencies

United Nations
United Nations Offices
Level 10, Menara PjH
2, Jalan Tun Abdul Razak, Precinct 2
62100 Putrajaya, Malaysia
Tel: 60 3 8689 6000
Fax: 60 3 8881 0458
Web: *https://malaysia.un.org/en*
Facebook: UnitedNationsMalaysia
X: @UNinMalaysia
Instagram: unitednationsmy

UN Office for the Coordination of Humanitarian Affairs (UNOCHA)
Web: *https://www.unocha.org*
Reliefweb: *https://reliefweb.int/*

The International Federation of Red Cross and Red Crescent Societies (IFRC) Asia Pacific Regional Office
Level 10, Menara Tokio Marine Life
189 Jalan Tun Razak
50400 Kuala Lumpur
Tel: 60 3 2161 0670
Web: *https://go.ifrc.org/*
https://www.ifrc.org/national-societies-directory/asia-pacific-regional-office

Regional Organizations

ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre)
Graha BNPB, 13th floor Jl
Raya Pramuka Kav. 38
East Jakarta 13120
Indonesia
Tel: 62 21 21012278
Fax: 62 21 21012287
Email: *info@ahacentre.org*
Web: *https://ahacentre.org/*
Instagram: ahacentre

Changi Regional HADR Coordination Centre (RHCC)
Changi Command and Control Centre (CC2C), Changi Naval Base
103 Tanah Merah Coast Road, Singapore 498750
Facebook: ChangiRHCC
Email: *Changi_RHCC@defence.gov.sg*
Web: *https://www.changrhcc.org*

Telecommunications Infrastructure

There are 8.4 million fixed telephone line subscribers in the country, equal to 24 subscriptions per 100 people.[304] Mobile cellular subscriptions total far more, with more than 98% of the population, or more than 35 million people, subscribing to a mobile service.[305]

Malaysia's mobile market is serviced by four large network operators. There is one fixed-line operator with a near-monopoly.[306] Around 61% of the country is covered by 5G from Digital Nasional Berhad (DNB), comprised of a group of five mobile operators that have a 70% stake in DNB. The Malaysian government's Jendela Initiative seeks to provide 100% 4G coverage with minimum speeds of 100 megabits per second (Mbps) by the end of 2025. The country has so far achieved nearly universal 4G coverage, with around 97% of the country having access to 4G coverage. 4G speeds have also improved with 50% of 4G sites equipped with fiber optic cables. Malaysia's older 3G network was shut down in 2022.[307]

Around 98% of Malaysia's residents are internet users. While some 95% of homes nationally have internet access, mobile broadband subscriptions are the norm, with 126 active mobile broadband subscriptions per 100 people.[308] The broadband market is led by the major companies TIME, Celcom, Maxis, CelcomDigi, and Telekom Malaysia. From roughly 2022, the country has made great progress in improving its "Fiber to the Home" footprint to provide speeds of 100 Mbps to over two-thirds of broadband subscribers. The Jendela initiative also sought to provide full-fiber networks to homes, businesses, and government buildings covering 98% of the population by the end of 2025.[309]

The MCMC implements and promotes national policy objectives for the communications and multimedia sector in accordance with the Communications and Multimedia Act 1998. The MCMC also oversees the regulatory framework for the converging telecommunications and broadcasting industries and online activities.[310]

Mass and Social Media

Online and social media are the main sources of news for Malaysians. Major news outlets include Bernama, the state-run news agency, Malysiakini, and Free Malaysia Today.

Malaysia's television sector includes state-owned and private networks, as well as pay TV platforms, with media ownership highly concentrated. Media Prima is the largest conglomerate. It operates four TV stations, and its national TV networks include TV3, the biggest over-the-air broadcaster. State-owned Radio Television Malaysia (RTM) operates two TV networks. There are several other commercial TV networks along with satellite TV subscription services. Private stations broadcast in Malay, Tamil, Chinese, and English.

Major English-language daily print outlets include the New Straits Times, The Star, The Sun, and the Malay Mail, all of which also have an online presence. Hard-copy newspaper circulation has declined.

State-owned radio broadcaster RTM operates around 30 national and regional radio networks, as well as local stations. There are many private commercial radio broadcasters, and some subscription satellite radio services are available. There are about 55 radio stations overall.[311]

In 2024, Malaysia had more than 33 million social media users, making it one of the countries with the highest social media penetration rates globally. In the Asia-Pacific region, Malaysia ranked third for the most average daily time spent on social media, with users spending around 2 hours and 46 minutes on various social media sites each day. Facebook is the most popular social media site, with other well-known platforms such as Instagram, YouTube, and LinkedIn also very popular. TikTok is gaining popularity among young users, with the TikTok app being downloaded 10 million times in 2024 alone. Around 67% of Malaysian responders to a 2024 survey said that social media is their main source for news. The MCMC has been trying to curb any potential spread of false information by advising users and issuing clarification statements on social media usage.[312]

Utilities

Nearly all Malaysians have access to electric power, and most have access to safe water and sewerage services. In urban areas, investment

in modernized power grids and underground water and sewerage pipes supports resilience and reduces the damage these networks sustain from hazard incidents, thereby insulating these communities from some health and safety impacts. In more remote areas, power, water, and sanitation infrastructure may be more exposed to hazardous conditions, and residents relying on these systems are more vulnerable to the health consequences of disruptions.

Since December 2023, PETRA has been the federal entity responsible for promoting development of electricity and water supply networks that reach all Malaysians. Its mission is to regulate the supply sectors of electricity production to ensure service and to promote governance within the water sector to improve the coverage and quality of water supply and sewerage services.[313]

Power

Since 2017, 100% of Malaysians have had access to electric power,[314] and the past decade has seen significant expansion in electricity generation. In 2023, the country had 37.2 gigawatts (GW) of installed generation capacity.[315] The power grid is the target of ongoing investment for modernization, optimization, and resilience. Elements of energy production, processing, and import-export, as well as electricity generation, transmission, and distribution networks are exposed to various hazards – especially storms or floods – that can disrupt localized power supplies. The potential remains for a large-scale hazard event to cause oil or gas spills that impact human health and damage the environment.

The country has steadily increased its electricity generation capacity, and, as of 2023, at least 11.7 GW of capacity were still slated to come online by 2031. Malaysia's Sarawak marks the sole point of electricity export, via the Sarawak-West Kalimantan Interconnection, which delivers power to Indonesia via a 275-kilovolt (kV) cable.

Oil and gas are strong but not dominant factors in the national electric power sector. Of the 225.9 billion kilowatt-hours of electricity generated in 2022, coal accounted for 41%, natural gas for 28%, oil for 14%, and renewables, dominated by hydro, for 15%. The National Energy Transition Roadmap aims for renewables to produce 70% of electricity by 2050.[316]

Fossil-fuel-powered plants are present near most of the population centers of Peninsular Malaysia, and in key areas of Sarawak. There are six coal-fired plants of greater than 100-megawatt (MW) capacity, 11 gas-fired plants of over 600-MW capacity, and two combined plants over 100-MW capacity. Hydropower plants concentrate in Sarawak and northern Peninsular Malaysia; there are 11 hydro plants of greater than 100-MW capacity. The country's largest hydro facility is central Sarawak's Bakun dam and plant, with an installed capacity of 2,400 MW. Major power plants and substations in the greater Kuala Lumpur area and the southern tip of the Peninsula are connected via 500-kV transmission lines, while the rest of the transmission network is dominated by 275-kV lines.[317]

Publicly-traded Tenaga Nasional Berhad (TNB) is the electricity power generator and supplier in Peninsular Malaysia. It continues to invest in the power grid to accommodate more customers, more renewable energy sources, and connections to the grids of Thailand and Singapore. Grid resilience is a major focus of a planned US$10.3 billion investment between 2025 and 2027.[318]

Sabah Electricity generates and distributes electricity in the State of Sabah and the Federal Territory of Labuan.[319] Sabah Electricity is majority owned by TNB, and the Sabah state government owns the remaining shares.[320] Sabah Electricity serves some 107,000 customers, and it is investing in various generation projects as well as transmission and distribution upgrades, including an interconnection with Sarawak.[321]

The Sarawak Energy Group serves 800,000 customers in Sarawak; it is the fully integrated generator (SEB Power), transmission, distribution, and retail provider (Syarikat SESCO), upstream developer, and

rural electrification implementor.[322] In 2024, it announced full electrification of Sarawak after it completed stand-alone, off-grid solar systems to serve remote communities.[323] SEB Power has a generation capacity of more than 5,700 MW, 60% of which is hydro, and it continues to invest in additional capacity.[324] From October 2025, Sarawak Energy is slated to begin supplying Sabah with 30 MW of power as it builds out the Borneo grid, intended to connect East Malaysia, Brunei, and Indonesia.[325]

Malaysia has a mature and productive oil and gas sector. Its national oil company, Petronas, is an owner-operator or a part-owner of five of seven refineries in the country. Petronas and other global corporations also operate various gas fields, pipelines, and liquefaction and regasification terminals. The Peninsular Gas Utilization pipeline network comprises 2,600 km (1,630 mi) of pipe, and there are additional pipelines connection portions of Sabah and Sarawak.[326]

Water and Sanitation

Safe and sustainable water supply is closely related to flood and drought hazard mitigation in Malaysia. The country continues to urbanize rapidly, and water challenges are plentiful. Changes in precipitation regimes alongside pollution from agriculture and industry disrupt clean water access.[327] Resilient water and sewerage infrastructure help reduce the potential for water-borne ailments to spread during emergencies, and well-managed water sources provide the potential to reduce flood impacts.

The dominant sources of water for use across domestic, agricultural, and industrial sectors are surface water (80%) or rivers and dams (18%). Domestic consumption is considered high, 245 liters (65 gallons) per capita per day, compared with the UN benchmark daily water requirement of 165 liters (44 gallons) per person per day.[328] Nonetheless, water for human consumption or use makes up only 1% of all water extracted from ground or surface sources. Agricultural and industrial uses are far more prevalent, and the quality of water nationally is deteriorating, as ever more marginal sources are used and as climate-related disruptions become more common and severe.[329] In the past decade, various floods and landslides have damaged pipes and water treatment plants, cutting off customers for long periods.

As of January 2022, the national statistics department reported that 94.9% of all Malaysian households had access to treated, piped water. In Sabah, that number was just higher than 80%, and in Sarawak, it was 83.7%. All but one state in Peninsular Malaysia reported a rate higher than 98% for households with access to treated water; Kelantan reported 74% of households with access.[330]

Also in 2022, the country reported that 86% of the population used a safely managed sanitation service and that 91% of domestic wastewater was safely treated. The proportion of residents with limited access to safe sanitation services was approximately equal in urban and rural areas – about 4%.[331]

PETRA has put forth an integrated water management policy, intended to ensure a safe and sustainable water supply for all Malaysians and to build flood mitigation and adaptation. The policy emphasizes stronger cooperation across federal, state, and local governments,[332] and it has more recently been augmented by the National Agenda for the Transformation of the Water Sector 2040 to accelerate water management framework adoption at all levels.

State governments are responsible for development, operation, and maintenance of water supplies. Each state may establish its own entities, including Public Works or Water Supply Departments or Boards or various types of corporate entity.[333] Water resources and provisions only become a federal matter if there are disputes among states.[334] Under PETRA, SPAN has regulatory authority over all public and private water supply and sewerage service companies in the Peninsula and Labuan.[335]

In small villages that fall under the Department of Orang Asli Development (Jabatan Kemajuan Orang Asli), it is common to have a few dozen houses connected by a single pipe that supplies treated water from a spring, reservoir, or river, even as residents access other

river or reservoir water for water they do not consume. These systems can be easily disrupted when drought reduces the availability of water or heavy rains send run-off into drinking water sources.[336]

Although still under PETRA's regulatory oversight at the federal level, sewerage and sanitation services are operated and maintained by a separate set of institutions.

There are various sanitation practices in use across the country. In urban areas, fully connected sewerage systems exist, although there are also unconnected individual and communal septic tanks. Meanwhile, in rural areas, pour flush toilets and latrines are still in use. One estimate is that there remain 1 million individual septic tanks still in operation across the country.[337]

Indah Water Konsortium (IWK) is a state-owned company under the Ministry of Finance. It delivers sanitation services across Peninsular Malaysia. Public sewage pipes and plants are operated and maintained by IWK. It operates more than 8,000 sewage treatment plants and pumping stations,[338] and it maintains more than 20,000 km (12,500 mi) of sewer pipes.[339] Of IWK's sewage treatment plants, an estimated one-quarter are Imhoff Tanks, which are simple and non-mechanical but require very secure tank storage to keep effluent out of the environment. Another 500 plants, or 12% of all sewage treatment plants, are oxidation ponds, where algae and bacteria naturally break down effluent in shallow ponds. These Imhoff and oxidation systems are steadily being replaced because of their inefficiency, weather dependence, and small capacity.[340]

Health Systems

Malaysia has been proactive in enhancing the quality of healthcare services across the country. The country is progressing towards achieving SDG 3 – "Good Health and Well-being" – with improvements in areas such as maternal and neonatal mortality rates, human immunodeficiency virus (HIV) infections, adolescent fertility, skilled birth attendance, and immunization coverage.[341] Meanwhile, the MOH continues to work with national and international partners to develop and implement guidelines and plans for public health emergencies, including disasters.

The Malaysian government's vision for primary care aligns with the SDGs, emphasizing a whole-of-government and whole-of-society approach that integrates multisectoral policies, empowered communities, and essential public health services.[342] Despite advancements, Malaysia faces ongoing challenges, including an aging population, a rise in non-communicable diseases (NCD), resource constraints, overcrowded clinics, and a double burden of malnutrition – both undernutrition and obesity.[343] As of 2021, NCDs such as cardiovascular diseases, stroke, diabetes, and chronic kidney disease were the leading causes of death and disability, alongside other factors like lower respiratory infections and traffic injuries.[344]

The country has made substantial strides in achieving universal health coverage (UHC), underpinned by a comprehensive dual healthcare system that emphasizes primary healthcare delivery. This system adopts a life-course approach, offering population-based services from birth to death.[345] The healthcare structure in Malaysia is decentralized, with responsibilities distributed across federal, state, and district levels.[346]

The health system encompasses both public and private sector players, each with a distinct role in delivering services to the population. The public sector is predominantly funded through federal government revenues, and it provides widespread coverage for the population. It ensures that essential health services are accessible to all Malaysians by offering heavily subsidized secondary and tertiary care services. In contrast, the private sector operates on a fee-for-service basis, primarily funded through individual out-of-pocket payments, private health insurance, and employer-sponsored benefits.[347]

As of August 2024, the country's healthcare infrastructure comprised approximately 148 hospitals, 1,097 health clinics, 1,688 rural

health clinics, 185 community clinics, 243 mobile health teams, 33 wellness hubs, 77 maternal and child clinics, and 5 public health laboratories. These facilities collectively serve the diverse healthcare needs of the population across various regions.[348] In terms of human resources, the national doctor-to-population ratio in 2025 stood at 1 doctor per 406 residents. The Malaysian government is committed to achieving a target of 1 doctor per 400 residents. To achieve this goal, the government has implemented incentive programs aimed at retaining medical officers.[349]

A central component of the effort to enhance service quality involves addressing disparities in healthcare access, particularly in remote and underserved regions. To this end, the government has prioritized infrastructure development by constructing new healthcare facilities in rural areas, investing in telemedicine, and deploying mobile health clinics to extend services to populations with limited access to traditional healthcare systems. These measures have improved accessibility and quality in rural communities and contributed to a narrowing of the gap between urban and rural health care. Despite these advancements, further progress is necessary to fully achieve the goals of UHC and to ensure that all Malaysians, regardless of geographic or socioeconomic status, have equitable access to comprehensive healthcare services.[350]

Complementing national efforts, the WHO has developed the Country Cooperation Strategy (CCS) for Malaysia for the period 2024–2028. The CCS is closely aligned with Malaysia's national health policies and priorities and provides a structured and strategic framework for WHO engagement in the country. It ensures coherence with global, regional, and national health strategies through an integrated governance approach. The CCS focuses on strengthening health systems to achieve UHC, addressing NCDs and other health risks, and promoting multisectoral collaboration. In alignment with national plans and the SDGs, the CCS outlines three strategic priorities: 1) supporting the implementation of Malaysia's health reform agenda to enhance health and well-being for all; 2) mobilizing a whole-of-government and multi-stakeholder approach to address health determinants beyond the healthcare sector; and 3) fostering regional and global cooperation to advance health objectives.[351]

In October 2024, the MOH introduced five key guidelines to strengthen disaster preparedness and response:

- National Disaster Management Plan
- Crisis Preparedness and Response Centre (CPRC) Standard Operating Procedure
- Chemical, Biological, Radiological, Nuclear, and Explosives Management Guidelines
- Guidelines for the Rapid Assessment Team and Rapid Response Team
- Guidelines for Human Resource Mobilization during Public Health Emergencies[352]

Malaysia has significantly strengthened its health security and emergency preparedness in line with the Malaysia Strategy for Emerging Diseases (MySED) and by operationalizing the National CPRC – particularly during the COVID-19 pandemic.[353] Established in 2007, the CPRC constitutes Malaysia's Public Health Emergency Operations Center (PHEOC) and forms a nationwide network encompassing all states and federal territories. The CPRC model is grounded in the Incident Management System for operations and utilizes the Incident Command System to coordinate disaster response efforts with NADMA, the Ministry of Defence, and other agencies. This model is cascaded to the state level, with each State Health Department housing its own PHEOC. At the district level, local health offices have the capacity to establish temporary operations rooms during public health emergencies. Furthermore, Malaysia's PHEOC leads the regional Southeast Asia PHEOC network, fostering collaboration and strengthening capacity.[354]

In 2023, MERCY Malaysia, an NGO, was officially recognized by the WHO as a Type 1 Fixed EMT. This classification signifies the

organization's capacity to provide outpatient care for acute trauma and non-trauma cases, manage referrals, conduct ongoing investigations, and deliver community-based primary care.[355] MERCY Malaysia plays a vital role in both crisis and non-crisis settings by focusing on emergency relief, sustainable health-related development, and resilience-building initiatives for vulnerable populations. Its work is integral to strengthening healthcare delivery and disaster response, particularly in underserved and high-risk communities.[356]

The Institute for Medical Research and the MOH's Disease Control Division collaborated to establish the Epidemic Intelligence Program in 2002. This 2-year program combines field-based epidemiological work with classroom instruction to build national and regional capacity in public health surveillance and outbreak investigation.[357]

Shelter and Housing

Malaysia is frequently affected by floods, landslides, storms, and heatwaves. According to NADMA, Northeast Monsoon flooding events between 2015 and 2022 occurred with high frequency, though the overall impact of these events was generally moderate. Nonetheless, the number of internally displaced persons (IDP) increased significantly during this period – from approximately 23,272 in 2015 to 138,916 in 2022– an indication of growing humanitarian need despite stable disaster impact levels.[358]

Shelter provision is a vital component of humanitarian response, as it supports both physical survival and psychological well-being. In the country, immediate and temporary shelters are provided for disaster-affected populations through the use of emergency structures, schools, community centers, and repurposed buildings. Financial assistance is also available to support the transition from emergency accommodation to temporary and ultimately permanent housing. In many cases, affected residents construct temporary wooden shelters, known as dampa, to maintain privacy and protection following a disaster. For instance, after a fire at the Sarawak Cultural Village in October 2025, displaced residents built dampa and received financial aid from the Social Welfare Department.[359]

Several humanitarian organizations, including MERCY Malaysia, MyCARE, and the MRC, play a key role in providing temporary shelter to disaster-affected communities.[360] MERCY Malaysia, for example, prioritizes emergency shelter as a dignified solution for communities displaced by disasters or conflicts. Following the 2004 Indian Ocean tsunami, which caused extensive damage to coastal regions throughout the Indian Ocean basin, MERCY Malaysia collaborated with architects to design post-disaster shelters aimed at protecting survivors while preserving their dignity.[361]

At the policy level, NADMA oversees and coordinates national shelter management based on standard operating procedures for all government agencies involved in disaster response and recovery, including emergency housing.[362] Additionally, NADMA coordinates closely with UNHCR and the IFRC on disaster response efforts through a cluster approach for specific needs like shelter and protection.[363]

Malaysia's housing sector remains resilient, driven by sustained demand for residential properties.[364] Looking ahead, the Government of Malaysia has outlined a socio-economic development roadmap with housing reform at the center of national priorities. It emphasizes the importance of resilient, sustainable, and inclusive housing development as a cornerstone of the country's long-term growth and disaster resilience strategy.[365]

Food Security

Malaysia's food system has key institutional strengths but also structural vulnerabilities. While national frameworks lay the foundation for a resilient, inclusive, and sustainable food system, continued progress depends on reducing import dependency, modernizing production, and strengthening disaster preparedness. Investments in digitizing the business of agriculture, infrastructure, crops, and local capacity building will be key to ensuring that food remains safe, affordable, and accessible

under both normal and emergency conditions.

Three ministries spearhead the implementation of Malaysia's food security policy, including the MAFS, which oversees the food supply and is responsible for developing the agricultural sector; the Ministry of Domestic Trade and Cost of Living, which manages food affordability and price control; and the MOH, which safeguards food safety and nutrition through regulations and enforcements.[366] For disaster response and assistance, MAFS serves as the lead authority for ensuring food remains accessible nationwide. Additionally, the MOH plays a supporting role by addressing public health and nutritional needs during emergencies.[367]

The national food system is largely based on the agrifood sector, which contributes to national food availability, accessibility, and stability.[368] Production reflects dual priorities: export-oriented commodities and domestic food. Key export food crops include palm oil and cocoa, which, along with rubber and wood products, account for nearly half of agricultural output. Fruits, vegetables, poultry, and rice supply the domestic market.[369] Poultry is the dominant protein, supported by relatively strong and well-developed husbandry and processing industries. Rice remains the primary staple, with over 300,000 paddy farmers, and domestic rice production covers about 70% of consumption, with the remainder imported.[370] To meet year-round demand and dietary preferences, Malaysia also relies on imports of various meat and dairy products, beverages, and produce, among other commodities.[371]

Urbanization and industrialization have shifted consumer habits towards processed and convenience foods, which now account for a growing share of diets. The result is increased import dependency and poorer nutrition, contributing to a double burden of malnutrition and diet-related NCDs.[372] Between 2014 and 2023, food imports nearly doubled, reflecting both consumption growth and production shortfalls.[373] This import reliance heightens exposure to global supply chain disruptions, price volatility, and export restrictions.

Recent events underscore this vulnerability. In 2023, India's curbs on non-basmati rice exports triggered panic-buying, price surges, and localized shortages in Malaysia.[374] Although domestic stockpiles helped prevent shortages, Malaysia subsequently secured a special authorization for 200,000 metric tons (220,500 tons) of rice imports to stabilize supply.[375] In 2022, amid a global feed shortage intensified by the Russia-Ukraine war, Malaysia temporarily banned exports of 3.6 million chickens per month and relaxed import regulations to stabilize domestic supplies.[376] These events illustrate how external shocks and input-cost volatility cascade through Malaysia's food system.

Challenges to food systems in Malaysia are multifaceted and include:

- High production costs and limited efficiency gains, especially among smallholders
- Natural resource scarcity and competition for arable land
- Demographic shifts and declining youth participation in agriculture
- Climate risk, including flooding, drought, and monsoon disruption
- Globalized supply chains that heighten exposure to unsafe imports or export restrictions
- Low awareness of food safety standards in informal markets[377]

Climate-related hazards are also increasingly significant factors in food security.[378] In December 2022, severe Northeast Monsoon flooding and landslides caused MYR 111.95 million (US$27 million) in damage to agriculture and agrifood sectors; rice and vegetable production were disrupted in several states.[379] These impacts reinforce the need for resilient infrastructure, EWS, and integrated food emergency planning.

The government's policy framework is anchored in the National Agrofood Policy 2.0 (2021-2030) and the Food Security Policy Action Plan (2021-2025). The National Agrofood Policy 2.0 aims to transform Malaysia into a sustainable, high-income,

agrifood country through digital agriculture, climate-smart practices, and innovation, while the Action Plan emphasizes resilience, diversification, and preparedness during crises and disasters.[380] These initiatives are aligned with the National Pathway for Food Systems Transformation, which outlines five strategic pathways:

1. Enhancing smallholder livelihoods and market access
2. Increasing productivity and sustainability through innovation and research
3. Strengthening supply chain agility and resilience to absorb shocks
4. Ensuring food safety and sustainability for all populations
5. Promoting responsible consumption and reducing food waste[381]

Malaysia's food security framework extends beyond production and trade to include contingency planning for emergencies and disasters. Recognizing the country's vulnerability to recurrent flooding, monsoon events, and supply chain disruptions, the government integrates food assistance and preparedness into its broader disaster management system. NADMA coordinates these efforts to ensure rapid mobilization of food aid and essential supplies during crises.[382] This coordination forms a vital part of Malaysia's strategy to maintain food access and stability even under emergency conditions.

During disasters such as floods and monsoon events, food assistance ensures immediate access to essential nutrition. NADMA has reported coordinating aid shipments of food packs and essentials to flood-affected areas in partnership with NGOs, state authorities, and private donors. For example, in February 2025, NADMA reported delivering 7.2 metric tons (8 tons) of ready-to-eat food packs and 5,000 family essentials kits across various districts.[383]

Non-governmental and private sector partners also play significant roles in augmenting government-led relief. The MRC, in partnership with Nestle Malaysia, provided 5,000 boxes of essential food items to evacuees in flood-affected areas in 2024.[384] Similarly, QSR Brands and the MRC collaborated with NADMA to distribute over 6,000 ready-to-eat meals to displaced persons in temporary shelters.[385]

To strengthen long-term preparedness, Malaysian researchers and policy institutions have developed frameworks for nutritionally adequate emergency food assistance based on local diets and disaster contexts. Studies supported by Malaysian universities and the MOH propose standardized emergency food menus that meet nutritional requirements and are suitable for rapid deployment during floods and other crises.

For contingency supply of rice, Padiberas Nasional Berhad (BERNAS) is Malaysia's principal rice corporate entity tasked with managing the National Rice Stockpile Scheme. It oversees 31 stockpile warehouses with capacity to maintain up to 290,000 metric tons (320,000 tons) of reserves. The stockpiles serve as an emergency food supply as well as a mechanism to stabilize supply and rice prices.[386] The government's oversight and policy arrangement ensure that BERNAS's stockpile responsibilities are not purely commercial.[387]

CONCLUSION

Malaysia has built significant capacity to respond to disasters domestically, and it has the expertise, skill, and willingness to support international disaster response operations in the ASEAN region and beyond.

Malaysia experiences floods, storms, landslides, heatwaves, and droughts. Floods are the most frequently occurring disaster, and they are also increasingly the most severe ones, both in Peninsular Malaysia and East Malaysia. Flooding in 2021-2022 was considered "once-in-a-century" for its scale, but the country is experiencing more extreme weather that brings heavy rainfall and leads to floods as climate change influences precipitation patterns. It was extreme flooding in 2014 that spurred reforms of the DM system as saw shifts toward a whole-of-government focus on DRR rather than just response. As DRR requires community input and action to mitigate the risk of hazard events and adapt to changing environments, this development began to pull together all levels of Malaysia's government and society in DM initiatives.

In 2015, in addition to integrating DRR, the country reorganized its DM institutional structure. At that time, the government created NADMA to be the national, regional, and international focal point for DM action and engagement. Within the country, NADMA leads development of strategies, plans, and guidance, and it oversees their implementation. It plays an advisory role for subnational DM authorities and leads coordination of government agencies during a disaster response. NADMA's NDCC is a critical command, coordination, and information node, as it is linked to technical and scientific agencies as well as to executive bodies and the media. On a regional level, NADMA engages with ASEAN's DM structures as well as with fellow AMS' NDMOs. Moreover, NADMA cooperates with global humanitarian and DM agencies and organizations.

The country's technical expertise in DM is also underpinned by skilled professionals, as found in the SMART. Malaysia's INSARAG-certified USAR team has extensive operational experience domestically and internationally, both within the ASEAN region and beyond. After SMART was established in 1995 -- in response to the 1993 collapse of the Highland Towers condominium in Selangor, to which foreign search and rescue teams responded -- it has since become the only ASEAN team and the second team in Asia after Japan to achieve the status of a Heavy USAR team from INSARAG. Beyond Malaysia, SMART has conducted post-earthquake rescue missions in Türkiye, India, Pakistan, Indonesia, Nepal, and Myanmar.[388] SMART is an integral part of the country's response structure, as it brings together civilian, police, and military personnel.

Malaysians are active participants in multilateral forums, including those pertaining to DM. The country has dozens of active ASEAN-ERAT team members ready to deploy to disasters in other AMS. It is also home to the main ASEAN DELSA stockpile of emergency relief items in WFP/UNHRD warehouses in Subang, a hub of logistics and operations support for the AHA Centre and the international humanitarian community. Furthermore, the capital, Kuala Lumpur, hosts regional offices and representatives of the IFRC. Meanwhile, the MRC is a key DM auxiliary to the Malaysian government, and Malaysian-based, international NGO, Mercy Malaysia, brings Malaysian capacity to support humanitarian crisis response around the globe.

Malaysia is facing increasing hydrometeorological threats, as seen with exacerbated, widespread flooding disasters in recent decades, and its DM approach is also evolving to tackle these challenges. It will remain a prime mover in regional DM initiatives as it seeks to ensure that sustainable and equitable development are not threatened by growing disaster risk.

APPENDICES

Risk Indices

Risk calculation takes into account exposure to hazards, vulnerability, and coping capacity. Addressing all of these elements is important for reducing and mitigating disaster risk. Various indices emphasize structural or institutional risk, while others emphasize hazards or losses (human and economic). Regardless of emphasis, disaster risk calculations use some form of the equation:

Disaster Risk = (Hazard × Vulnerability) / Capacity[389]

Taken from the UNDRR glossary, definitions will help clarify this formula:

- Capacity - The combination of strengths, attributes, and resources available within an organization, community, or society to manage and reduce disaster risks and strengthen resilience.
- Disaster risk - The potential loss of life, injury, or destroyed or damaged assets, which could occur to a system, society, or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability, and capacity.
- Hazard - A process, phenomenon, or human activity that may cause loss of life, injury, or other health impacts, property damage, social and economic disruption, or environmental degradation.
- Vulnerability - The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of an individual, a community, assets, or systems to the impacts of hazards.[390]

In general, the goal of indexing risk is to inform decision makers and DRR and climate adaptation practitioners of the level of risk to and underlying capacity of the target community. The various risk calculation models support proactive crisis management frameworks and are helpful for prioritizing allocation of resources and for coordinating actions focused on anticipating, mitigating, and preparing for humanitarian emergencies.

INFORM Risk Profile

INFORM is a collaboration of the Inter-Agency Standing Committee Reference Group on Risk, Early Warning, and Preparedness with the European Commission. It is a multi-stakeholder forum for developing shared, quantitative analysis relevant to humanitarian crises and disasters. The Joint Research Center of the European Commission is the scientific lead. There are three operational dashboards – i.e., INFORM Risk, INFORM Severity, and INFORM Climate Change.[391]

The INFORM Risk Index is an open-source assessment that supports prevention, preparedness, and response decisions. It measures the risk of humanitarian crises and disasters in 191 countries. The INFORM model is based on the standard dimensions of risk: Hazards and Exposure, Vulnerability, and [Lack of] Coping Capacity. The first dimension measures the natural and human hazards that pose the risk. The second and third dimensions cover population factors that can mitigate against or exacerbate the risk. The Vulnerability dimension considers the strength of individuals and households relative to a crisis while the Lack of Coping Capacity dimension considers factors of institutional strength – or lack thereof.[392]

The INFORM model is split into different levels to provide a quick overview of the underlying factors leading to humanitarian risk. INFORM gives each country a risk score of 1-10 (1 being the lowest risk and 10 the highest) for each of the dimensions, categories, and components of risk, as well as an overall risk score.[393] In the 2025 INFORM Risk Index, Malaysia had an overall risk score of 3.3/10, which INFORM categorizes as the "Medium" risk class and lands Malaysia as the 103rd

most at-risk country in the Index. The Hazards and Exposure dimension takes into account a combination of both natural and anthropogenic hazards, and Malaysia rated 2.7/10 or 107th of 191 countries. The Vulnerability dimension score was 3.4/10 or 111th of 191, and the Lack of Coping Capacity dimension score was 3.9/10 or 107th of 191. Physical exposure to River Floods at 6.8/10, was the greatest threat in the Hazards and Exposure dimension. Uprooted People, measuring 7.1/10, was the Vulnerability with the highest score in that dimension. Institutional capacity for DRR rated 6.0/10, a score that ranks it as the most significant contributor to the country's Lack of Coping Capacity. Figure 14 shows the INFORM Risk dashboard for Malaysia for 2025.[394]

U.S. Government Disaster Management Engagement

The U.S. State Department's Bureau of Population, Refugees, and Migration (PRM) is the lead federal office for short-term foreign humanitarian response. Broadly, PRM coordinates humanitarian policy and diplomacy, provides life-sustaining assistance, and builds global partnerships to promote best practices in disaster relief. At the country level, these activities are executed by the agencies that form part of a U.S. Country Team, under the leadership of the Chief of Mission (COM), who holds responsibility for making a Declaration of Humanitarian Need (DHN) if a major disaster triggers requests for international assistance. In order to build preparedness rather than simply react to large-scale events, the Country Team and other U.S. Government stakeholders undertake regular engagements for training, information sharing, and capacity strengthening. Among the key stakeholders in Malaysia are U.S. INDOPACOM and its subordinate commands and units, as well as the Washington National Guard, who, under the State Partnership Program (SPP) of the U.S. National Guard, have cooperated with Malaysian stakeholders since 2017.

The MAF and the U.S. military have had a long relationship that has dated back many decades. As part of this long-standing relationship, Malaysia and the U.S. signed a defense cooperation agreement on the sidelines of the ASEAN Defense Ministers' Meeting (ADMM) and ADMM - Plus in Kuala Lumpur in late October - November 2025. The Memorandum of Understanding (MoU) renewed and expanded collaboration between the Malaysian and U.S. armed forces. The agreement is intended to create a partnership framework that aims, among other things, to improve regional security and better interoperability between the two armed forces.

Additionally, as part of the agreement, an Acquisition and Cross-Servicing Agreement (ACSA) between the MAF and U.S. forces was renewed in 2025. Originally signed in 2017, the ACSA enables mutual provision of supplies. fuel and logistical support for facilitating operations.[395]

U.S. Country Team

The U.S. has had an Embassy in Kuala Lumpur since 1957 and upgraded the bilateral relationship to a Comprehensive Partnership in 2014. The two countries share close cooperation, especially on security issues, and their respective military and law enforcement bodies cooperate across training and exercises.

U.S. Embassy in Kuala Lumpur
376 Jalan Tun Razak
50400 Kuala Lumpur, Malaysia
Tel: 60-3-2168-5000

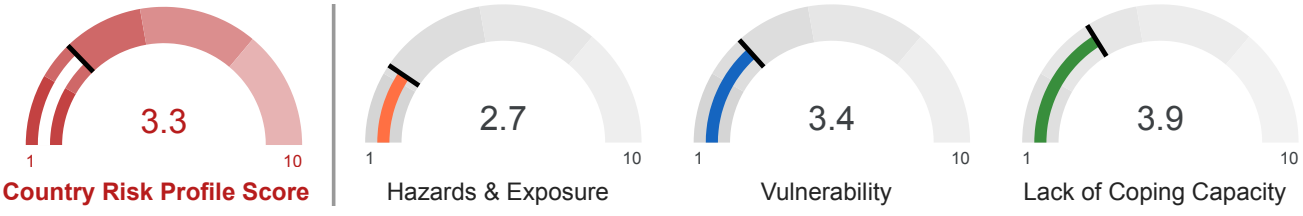


Figure 14: INFORM Risk Dashboard, Malaysia (2025)

Web: *https://my.usembassy.gov/*
Facebook / Instagram / X: usembassykl

The Washington National Guard partners with Malaysia under the SPP, which is guided by State Department foreign policy goals and executed by the adjutant-general of the state (in this case, Washington State) in support of a combatant commander (here, USINDOPACOM) and U.S. COM's security cooperation objectives and Department of Defense (DoD) policy goals. Since 2002, the Washington National Guard had partnered with Thailand, and, in 2017, they had the opportunity to add a partnership with Malaysia. Leaders cited a rare opportunity to build two similar partnerships with countries that not only border each other but that also share many security cooperation areas of interest. The Washington Guard, under the Washington Military Department, and its partner countries maintain a schedule of regular meetings, conferences, exercises, and training opportunities through which they share best practices for military support to civilian authorities, emergency management, disaster planning, and other missions.[396]

Since 2007, Kuala Lumpur has also hosted personnel from one of three of the U.S. Navy's overseas medical research commands. The Singapore-headquartered Naval Medical Research Unit (NAMRU) INDO PACIFIC collaborates with partners in Australia, Cambodia, Laos, Malaysia, Mongolia, Papua New Guinea, Singapore, Thailand, and Vietnam to conduct medical research to meet the needs of U.S. service members in the region. Two key Malaysian partners are the Tropical Infectious Diseases Research and Education Centre (TIDREC) at the University of Malaysia and the National Defence University of Malaysia.[397]

Large-Scale Responses

When a disaster overwhelms the response capacity of an affected country and its international humanitarian partners, the U.S. Government may respond to a request for international assistance. The COM can issue a DHN that triggers assistance – in the form of funding, technical support, or relief items – via the PRM's Office of International Disaster Response (PRM / IDR), which replaced the U.S. Agency for International Development (USAID) Bureau for Humanitarian Affairs (BHA) in 2025. PRM / IDR may mobilize Regional Disaster Advisors, deploy a Disaster Assistance Response Team (DART), stand up a Response Management Team, or move to deliver food or non-food relief. Additional support may be in the form of USAR teams or experts to help manage a chemical, biological, radiological, nuclear, or explosive incident. If civilian capacity is insufficient to meet life-saving need, PRM / IDR may request DoD support, via an intra-U.S. Government process, for unique DoD capabilities for a set period.

Flooding – December 2021

On 16 December 2021, a tropical depression brought heavy rain and high winds. NADMA reported that 33 districts in 8 states had been impacted across Peninsular Malaysia. An estimated 70,000 people were affected, with some 67,600 of them displaced to 470 evacuation centers. Flooding and debris flows blocked roads and bridges. By 23 December, authorities reported that at least 37 people had been killed, and early estimates pointed to US$200 million in economic losses. With Malaysian government authorities in charge of the national response, MRC and other local groups were complementing efforts.[398] To aid relief efforts, the U.S. government, through USAID, donated US$100,000 to the MRC. These funds were targeted to support flood-affected households through the provision of health services, including medical treatment, disease prevention, and mental health services.[399]

COVID-19 – 2021

During 2021, the U.S. Embassy in Kuala Lumpur delivered assistance to support Malaysia's public health efforts related to the COVID-19 pandemic. In March and June, the U.S. Embassy and its Office of Defense Cooperation (ODC) delivered equipment worth

a total of US$250,000. In March, Ambassador McFeeters and members of the ODC team visited the Malaysia Agro Exposition Park Serdang quarantine center for the delivery of the first part of a personal protective equipment (PPE) donation to the MOH. The U.S. Embassy delivered additional relief assistance in June. The supplies were delivered to NADMA in Putrajaya and included information technology equipment that NADMA used to manage response operations. The donation also included PPE, e.g., facemasks, hand sanitizers, and thermometers. This assistance was made possible through the ODC by U.S. DoD and the USINDOPACOM Overseas Humanitarian, Disaster, and Civic Aid office.[400]

In July 2021, a shipment of 1 million doses of the Pfizer-BioNTech COVID vaccine were delivered for distribution to vaccine centers nationwide.[401] Then, in December, the Embassy delivered a further US$250,000 donation. With funding from USAID, the U.S. Government directed the donation in partnership with nationwide NGO efforts to distribute care packages comprised of non-perishable foods and household essentials to 4,000 struggling households. The assistance was coordinated by the Malaysia Reform Initiative Program and provisions sourced from local vendors. Partner organizations were chosen based on capacity and ability to reach those in need both on the Peninsula and in Sabah and Sarawak. Partner organizations included Dignity for Children, ABIM, IKRAM, Bersih 2.0, Liga Rakyat Demokratik, and Suriana Welfare Society.[402]

DoD DM Engagements

Bersama Warrior

Exercise Bersama Warrior is an annual bilateral Malaysia-U.S. drill, designed to strengthen defense ties, enhance combined interoperability, and develop combined staff processes. Service members with the MAF, USINDOPACOM, and U.S. joint forces participate in staff and command post exercises (STAFFEX and CPX, respectively) in alternating years of the event, hosted by the MAF. The foundation is the Military Decision Making Process – Multinational (MDMP-M), a key component of the Multinational Force Standard Operating Procedures (MNF SOP).

The 2025 iteration brought together a mix of active duty, reserve, and National Guard members from the U.S. Army, Marine Corps, Navy, and Air Force to plan alongside their Malaysian counterparts. U.S. and Malaysian planners worked to develop a combined operations order in response to a regional contingency scenario requiring humanitarian assistance and stability operations.[403] This iteration was only the second since activities resumed following the COVID-19 disruption. The 2024 iteration was also a STAFFEX that delivered a comprehensive academic framework for the training audience through modules that covered each phase of the MDMP-M before asking the participants to work on a plan for a disaster response operation. The participants' results and strategies were subsequently presented to the Joint Combined Task Force leadership, and the output demonstrated collaborative efforts and planning skills developed during the exercise.[404]

The 2023 exercise, held in Kuantan, included the Washington National Guard under the SPP. The exercise has been ongoing since 2017.[405]

Cooperation Afloat Readiness and Training (CARAT) Malaysia 2024

A long-standing regional exercise, CARAT is an annual naval and Marine Corps event aimed to build interoperability between regional and U.S. military forces. Malaysia has been a part of CARAT since it began in 1995. The most recent iteration held in Malaysia was in Lumut, Perak in 2024, where over an eight-day period beginning in late October, military members from both nations engaged in joint activities to strengthen cooperation. The event also commemorated the 30th anniversary of the exercise. During the exercise, participants focused on the full spectrum of naval capabilities both onshore and at sea. The exercise featured subject matter expert exchanges and joint training with a focus on interoperability.

While much of the exercise is focused on shared maritime security challenges in the region, disaster response training is often integrated into the exercise.

Participating U.S. forces included the U.S Navy's USS Dewey, personnel from U.S. 7th Fleet, Commander, Task Force (CTF) 71, 72, 73, 75, and 76, Command, Destroyer Squadron (DESRON) 7, and Marine Rotational Force – Southeast Asia. The U.S. forces participated alongside their counterparts in the Royal Malaysian Navy.[406]

Indo-Pacific Military Health Exchange – September 2023

More than 500 health professionals from 24 nations, including the U.S., converged at the Indo-Pacific Military Health Exchange (IPMHE), co-hosted by MAF Health Services, from 26 to 29 September 2023. The IPMHE is a multilateral military event focused on partnership and interoperability and co-hosted by the armed forces of a country in the Indo-Pacific region together with USINDOPACOM's Command Surgeon. The 2023 theme was "Achieving Health Solutions Through Diversity and Inclusivity." Participants ranged from non-commissioned officers to senior leaders, and they came together for a symposium, poster presentations, hands-on clinical training workshops, bilateral meetings, and a visit to the Malaysian field hospital. During the event, U.S. Air Force personnel shared presentations on clinical and operational medicine, global health security, and partnerships that enhance readiness of U.S. and partner nations. Members of the Washington Air National Guard delivered a presentation titled "Early Inclusion and Collaboration Among Partners to Enhance Enroute Patient Care." Another component of the IPMHE was a series of bilateral meetings between senior leaders from the U.S. and partner nations; they emphasized priorities for cooperation, such as aerospace medicine and patient movement. Over many years of cooperation, Malaysia has routinely exercised their field hospital along with the U.S. and other regional partners. In recent years, Malaysia deployed the field hospital to provide disaster relief in Bangladesh and Türkiye. Concurrent with the IPMHE, the Washington National Guard and MAF Health Service conducted a mass casualty exercise utilizing the field hospital.[407]

Pacific Partnership – September 2023

On 6 September 2023, Malaysia's Kuantan hosted a stop of Pacific Partnership 2023. Pacific Partnership is the largest annual multinational humanitarian assistance and disaster relief preparedness mission conducted in the Indo-Pacific. This stop marked the first time since 2019, when Pacific Partnership visited Kuching, Sarawak, that the mission had visited Malaysia. Pacific Partnership enables participants to work together to enhance disaster response capabilities and foster new and enduring friendships. At the invitation of Malaysia, the 2023 mission conducted humanitarian and civic preparedness activities in engineering, disaster response, and public health. Nearly 1,500 personnel from Australia, Canada, Chile, Japan, New Zealand, Republic of Korea, the United Kingdom, and the United States participated. While in Kuantan, Pacific Partnership provided tailored medical care focusing on subject matter expert exchanges and community education; constructing and reconstruction of multiple schoolhouses; and knowledge exchanges.[408]

Pacific Angel – August 2022

Exercise Pacific Angel 2022-2 wrapped up in Malaysia on 19 August 2022 after a week of multilateral activities that brought together 370 participants from 6 countries to foster cooperation and interoperability during humanitarian assistance and disaster relief operations. Members from the U.S. Pacific Air Forces, RMAF, Royal Australian Air Force, and NGOs, as well as observers from Indonesia, Mongolia, and the Philippines, conducted training flights on U.S. and Malaysian aircraft and enacted subject matter expert exchanges. Pacific Angel 22 was the first bilateral air exercise held in Malaysia since 2018.[409]

Additional Resources

This appendix provides additional references, with links, to enable readers to find relevant and contextual information.

International and U.S. Government Sources
U.S. Embassy in Malaysia *https://my.usembassy.gov/*
CIA World Factbook *https://www.cia.gov/the-world-factbook/countries/malaysia/*
Travelers' Health U.S. Centers for Disease Control and Prevention *https://wwwnc.cdc.gov/travel/destinations/traveler/none/malaysia?s_cid=ncezid-dgmq-travel-single-001*
Country Analysis 2025 United Nations Resident Coordinator's Office *https://malaysia.un.org/en/298806-un-country-analysis-ca-malaysia* *In-depth examination of key issues across governance, economic stability, society, sustainability, and humanitarianism.*
Sendai Framework for Disaster Risk Reduction 2015-2030 United Nation Office for Disaster Risk Reduction *https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030* *Outlines targets and priorities for action to prevent new and reduce existing disaster risk.*
European Commission Disaster Risk Management Knowledge Centre INFORM Risk Index *https://drmkc.jrc.ec.europa.eu/inform-index*
USINDOPACOM Foreign Disaster Response in the Indo-Asia-Pacific April 1991 – January 2024 CFE-DM, U.S. Pacific Command *https://www.cfe-dmha.org/Publications/New-Releases* *Contemporary historical synopsis of foreign disasters the U.S. DoD responded to in the Indo-Pacific.*

National Disaster Management Resources
National Disaster Management Agency (NADMA) Government of Malaysia *https://www.nadma.gov.my/*
NADMA Disaster Portal (Portal Bencana [Bahasa]) NADMA, Government of Malaysia *https://portalbencana.nadma.gov.my/ms/*
NADMA Strategic Plan 2024-2028 (in Bahasa) NADMA, Government of Malaysia *https://www.nadma.gov.my/images/2025/TerbitanDalaman/PELAN_STRATEGIK_NADMA_2024-2028.pdf* *Lays out the guidelines for NADMA's leadership for disaster management and disaster risk management nationally.*
MET Malaysia Malaysian Meteorological Department, Government of Malaysia *https://www.met.gov.my/en/*
Malaysian Red Crescent (MRC) *https://redcrescent.org.my*

Regional/International
AHA Centre Association of Southeast Asian Nations Center Coordinating Centre for Humanitarian Assistance on disaster management *https://ahacentre.org/* *Inter-governmental office to facilitate cooperation and coordination among ASEAN member states and with the UN and international organizations for disaster management and emergency response within the ASEAN region.*
Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations (SASOP), Version 3.0 Association of Southeast Asian Nations (ASEAN). 2022. *https://ahacentre.org/publication/sasop-v3/* *SOP for ASEAN (of which Thailand is a member-state) disaster standby arrangements and joint ASEAN disaster relief procedures.*
Asia-Pacific Regional Guidelines for the Use of Foreign Military Assets in Natural Disaster Response Operations ("APC-MADRO Guidelines") The Asia-Pacific Conferences on Military Assistance to Disaster Relief Operations (APC-MADRO) & UN Office for the Coordination of Humanitarian Affairs (OCHA), 2014 *https://www.unocha.org/publications/report/world/asia-pacific-regional-guidelines-use-foreign-military-assets-natural-disaster-response* *Reference guide for states planning and executing foreign military support for regional disaster response.*
Multinational Force Standing Operating Procedures (MNF SOP) – Annex C: Humanitarian Assistance/ Disaster Relief Multinational Planning Augmentation Team (MPAT), U.S. Indo-Pacific Command *https://www.pacom.mil/Portals/55/Documents/J7/MNF%20SOP%20Ver%203.4_14%20FEB%2025_vbf.pdf?ver=4LVTNxMJB8_1xpfxYdARrg%3d%3d (D1 C1/ PDF pg. 883)* *Annex on international humanitarian assistance; part of broad standing procedures for regional multinational force operations other than war.*

U.S. DoD Training
Humanitarian Assistance Response Training – Disasters (HART-D) Course CFE-DM, U.S. Pacific Command *https://www.cfe-dmha.org/hart-d* *Target Audience: O3-O6, E6-E9, and DoD civilians who may plan for or execute a Foreign Disaster Relief mission or participate in disaster response activities in exercises or security cooperation engagements.*

Acronyms and Abbreviations

°	degree(s) - of temperature (Celsius [C} or Fahrenheit [F]), slope, or of latitude and longitude (North [N], South [S], East [E], and West [W])
$	dollar(s) - of the U.S.
AADMER	ASEAN Agreement on Disaster Management and Emergency Response
AHA Centre	ASEAN Coordinating Centre for Humanitarian Assistance on disaster management
AMS	ASEAN Member State
APM	Malaysian Civil Defence Force (Angkatan Pertahanan Awam Malaysia)
ASEAN	Association of Southeast Asian Nations
BHA	Bureau for Humanitarian Affairs (of the former USAID)
BNM	Bank Negara Malaysia
CAAM	Civil Aviation Authority of Malaysia
CBDRM	community-based disaster risk management
CCS	Country Cooperation Strategy
CFE-DM	Center for Excellence in Disaster Management and Humanitarian Assistance (of the U.S. DoD)
COM	Chief of Mission
COVID-19	Coronavirus Disease 2019
CPRC	Crisis Preparedness and Response Centre
CPX	command post exercises
CRED	Centre for Research on Epidemiology of Disasters
DART	Disaster Assistance Response Team
DELSA	Disaster Emergency Logistics System for ASEAN
DGIM	Defence Geospatial Information Management
DHN	Declaration of Humanitarian Need
DID	Department of Irrigation and Drainage
DOCC	Disaster Operations Control Centre
DoD	Department of Defense
DRM	disaster risk management
DRR	disaster risk reduction
DM	disaster management
DoE	Department of Environment
EAS	East Asia Summit
ECRL	East Coast Rail Link
EM-DAT	international disaster database (of the CRED)
EMT	Emergency Medical Team
EOC	emergency operations center
ERAT	Emergency Rapid Assessment Teams (of ASEAN)
ERL	Express Rail Link
EWS	early warning system

ft / ft^2	foot (feet) / square foot (feet)
GDP	gross domestic product
GW	gigawatt
HFMD	hand, foot, and mouth disease
ICG/IOTWMS	Indian Ocean Tsunami Warning and Mitigation System
ICLT	In-Country Liaison Team (of the AHA Centre)
ICRC	International Committee of the Red Cross
IDP	internally displaced person
IDR	Office of International Disaster Response (of the U.S. State Department)
IFRC	International Federation of Red Cross and Red Crescent Societies
in	inch(es)
INDOPACOM	Indo-Pacific Command (of the U.S. Department of Defense)
INSARAG	International Search and Rescue Advisory Group
IPMHE	Indo-Pacific Military Health Exchange
IOC	Intergovernmental Oceanographic Commission
IOM	International Organization for Migration
IWK	Indah Water Konsortium
JBPM	Fire and Rescue Department (Jabatan Bomba dan Penyelamat Malaysia)
JKM	Department of Social Welfare (Jabatan Kebajikan Masyarakat)
JMG	Department of Mineral and Geosciences
JOCCA	Joint Operations and Coordination Centre of ASEAN
JPBD	District Disaster Management Committee
JPBN	State Disaster Management Committee
JPBP	Central Disaster Management Committee
KKR	Ministry of Works
km / km^2	kilometer(s) / square kilometer(s)
KLIA	Kuala Lumpur International Airport
kV	kilovolt
LNG	liquified natural gas
m / m^2	meter(s) / square meter(s)
MAF	Malaysian Armed Forces (Angkatan Tentera Malaysia)
MAFS	Ministry of Agriculture and Food Security
MAHB	Malaysia Airports Holdings Berhad
Mbps	megabits per second
MCMC	Malaysian Communications and Multimedia Commission (Suruhanjaya Komunikasi dan Multimedia, SKMM)
MDMP-M	Military Decision Making Process – Multinational
mi / mi^2	mile(s) / square mile(s)
MHEWS	multi-hazard early warning system

mm	millimeter(s)
MNF SOP	Multinational Force Standard Operating Procedures
MOH	Ministry of Health
MOT	Ministry of Transport
mppa	million passengers per annum
MRA	Malaysian Relief Agency
MRC	Malaysian Red Crescent
Mw	Moment Magnitude
MW	megawatt
MYR	Malaysian ringgit
NADMA	National Disaster Management Agency
NCD	non-communicable disease
NDCC	National Disaster Command Centre
NDMO	national disaster management organization
NDMS	National Health and Morbidity Survey non-government organization
NGO	non-government organization
NSC	National Security Council
OCHA	Office for the Coordination of Humanitarian Affairs (of the United Nations)
ODC	Office of Defense Cooperation (of a U.S. Embassy)
OKU	Orang Kurang Upaya / people living with disabilities
PDRM	Royal Malaysia Police (Polis Diraja Malaysia)
PETRA	Ministry of Energy Transition and Water Transformation
PHEOC	Public Health Emergency Operations Center
PPE	personal protective equipment
PRAB	National Forecasting and Warning Program
PRABN	National Flood Forecasting and Warning Centre
PRC	People's Republic of China
PRIME	Mobile Integrated Radio and Internet Communication System
PMR	Bureau of Population, Refugees, and Migration (of the U.S. State Department)
PTP	Port of Tanjung Pelepas
RMAF	Royal Malaysian Air Force
RTM	Radio Television Malaysia
SAATNM	Malaysia's National Tsunami Early Warning System (Sistem Amaran Awal Tsunami National Malaysia)
SAR	search and rescue
SASOP	ASEAN Standard Operating Procedure for Regional Standby Arrangements and Coordination of Joint Disaster Relief and Emergency Response Operations
SDG	Sustainable Development Goal
SG-AHAC	ASEAN Humanitarian Assistance Coordinator (Secretary-General)

SMART	Special Malaysia Disaster Assistance and Rescue Team
SP	strategic priority
SPAN	National Water Services Commission (Suruhanjaya Perkhidmatan Air Negara)
SPP	State Partnership Program
STAFFEX	staff exercise
TEU	Twenty-Foot Equivalent Unit
TNB	Tenaga Nasional Berhad
U.S.	United States
UHC	universal health coverage
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commission on Refugees
UNHRD	United Nations Humanitarian Response Depot
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USAR	Urban Search and Rescue
WASH	water, sanitation, and hygiene
WFP	World Food Programme
WHO	World Health Organization
WMO	World Meteorological Organization
WPS	Women, Peace and Security

Endnotes

1 Leinbach, T., Lockard, C. Britannica. Climate of Malaysia. 14 Aug 2025. https://www.britannica.com/place/Malaysia/Climate.

2 Chan, N. W. (2012), 'Impacts of Disasters and Disasters Risk Management in Malaysia: The Case of Floods', in Sawada, Y. and S. Oum (eds.), Economic and Welfare Impacts of Disasters in East Asia and Policy Responses. ERIA Research Project Report 2011-8, Jakarta: ERIA. pp.503-551. Accessed 14 Aug 2025. https://www.eria.org/Chapter_14.pdf.

3 Raikar, Sanat Pai. Britannica. 14 July 2025. Mount Kinabalu. https://www.britannica.com/place/Mount-Kinabalu

4 ArcGIS Online. https://www.arcgis.com/home/index.html

5 Sani G. D/iya, Muhd Barzani Gasim, Mohd Ekhwan Toriman, and Musa G. Abdullahi. Floods in Malaysia: Historical Reviews, Causes, Effects and Mitigations Approach. International Journal of Interdisciplinary Research and Innovations. October – December 2014. available from ResearchPublish.com. https://www.researchpublish.com/upload/book/FLOODS%20IN%20MALAYSIA-760.pdf.

6 Yusoff, F. M., Shariff, M., & Gopinath, N. July 2006. Diversity of Malaysian aquatic ecosystems and resources. Aquatic Ecosystem Health & Management, 9(2), 119-135. https://doi.org/10.1080/14634980600713315; Sani G. D/iya, Muhd Barzani Gasim, Mohd Ekhwan Toriman, and Musa G. Abdullahi. Floods in Malaysia: Historical Reviews, Causes, Effects and Mitigations Approach. International Journal of Interdisciplinary Research and Innovations. October – December 2014. Accessed 15 Sept 2025. https://www.researchpublish.com/upload/book/FLOODS%20IN%20MALAYSIA-760.pdf.

7 Lockard, C. and Ahmad, Z.B. Britannica. 14 Aug 2025. Climate of Malaysia. https://www.britannica.com/place/Malaysia/Climate.

8 Kawasanku dashboard. Accessed 27 Aug 2025. https://open.dosm.gov.my/dashboard/kawasanku; Department of Statistics Malaysia (DOSM). Population and Housing Census of Malaysia 2020 (MyCensus 2020). Putrajaya: DOSM. https://www.dosm.gov.my.

9 Ministry of Economy, Department of Statistics Malaysia Official Portal. Accessed 25 Aug 2025. https://open.dosm.gov.my/dashboard/population; https://www.statistics.gov.my/portal-main/release-content/current-population-estimates-2025.

10 Department of Statistics Malaysia (DOSM). (2024). Current Population Estimates, 2024 [Data release]. Department of Statistics Malaysia. https://www.statistics.gov.my/portal-main/release-content/current-population-estimates-2024; Department of Statistics Malaysia (DOSM). (2023). Current Population Estimates, 2023 [Data release]. Department of Statistics Malaysia. https://www.dosm.gov.my/site/downloadrelease?id=current-population-estimates-malaysia----2023&lang=English&admin_view.

11 World Bank Group. Data – Population growth (annual %) – Malaysia. Accessed 14 October 2025. https://data.worldbank.org/indicator/SP.POP.GROW?locations=MY

12 Department of Statistics Malaysia (DOSM). Current Population Estimates, 2025. DOSM portal. https://www.statistics.gov.my/portal-main/release-content/current-population-estimates-2025.

13 Department of Statistics Malaysia (DOSM). 17 October 2024. Fertility Rate (TFR and ASFR) dataset. OpenDOSM. https://open.dosm.gov.my/data-catalogue/fertility?age_group=tfr&visual=fertility_rate; https://www.dosm.gov.my/site/downloadrelease?id=vital-statistics-malaysia-2023&lang=English&admin_view.

14 United Nations Development Programme (UNDP). UNDP Malaysia. Navigating the future of care for older persons in Malaysia by 2040: From community support to technological integration. 15 June 2024. https://www.undp.org/malaysia/blog/navigating-future-care-older-persons-malaysia-2040-community-support-technological-integration; The Star. Elderly population to hit 17% by 2040, says Stats Dept. 6 Sept 2024. https://www.thestar.com.my/news/nation/2024/09/06/elderly-population-to-hit-17-by-2040-says-stats-dept.

15 Ministry of Economy, Department of Statistics. ABRIDGED LIFE TABLES MALAYSIA, 2024. Accessed 25 Aug 2025. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=abridged-life-tables-malaysia-2024&lang=English.

16 Worldometers. Malaysia Population (Live). Accessed 25 Aug 2025. https://www.worldometers.info/world-population/malaysia-population/.

17 Department of Statistics Malaysia (DOSM). 31 July 2025. Current Population Estimates, Malaysia, 2025. Putrajaya: DOSM. https://www.statistics.gov.my/portal-main/release-document-log?release_document_id=15326.

18 World Bank. (2025). Urban population (% of total population) – Malaysia. In World Development Indicators. Accessed 25 Aug 2025, from https://tradingeconomics.com/malaysia/urban-population-percent-of-total-wb-data.html.

19 Macrotrends. Kuala Lumpur Metro Area Population (1950–2025). Accessed 25 Aug 2025. https://www.macrotrends.net/global-metrics/cities/206411/kuala-lumpur/population.

20 Macrotrends. Johor Bahru, Malaysia Metro Area Population (1950-2025). Accessed 25 Aug 2025. https://www.macrotrends.net/global-metrics/cities/21804/johor-bahru/population.

21 City Population. George Town. http://citypopulation.de/en/malaysia/pulaupinang/admin/timur_laut/070444__george_town/.

22 City Population. Malaysia. Accessed 9 Sept 2025. https://www.citypopulation.de/en/malaysia/cities/.

23 Ministry of Economy Department of Statistics Malaysia. Current Population Estimates, Malaysa, 2023. https://www.dosm.gov.my/site/downloadrelease?id=current-population-estimates-malaysia----2023&lang=English&admin_view.

24 Photo by Esmonde Yong, Unsplash, 2020. https://unsplash.com/photos/high-rise-building-during-night-time--9B08uduMyY

25 Ministry of Economy, Department of Statistics Malaysia. Demographic Statistics, First Quarter 2025. 14 May 2025. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=demographic-statistics-first-quarter-2025&lang=English&.

26 UNICEF Country Office Annual Report 2023. Malaysia. Accessed 2 Sept 2025. https://www.unicef.org/media/152166/file/Malaysia-2023-COAR.pdf; Global Nutrition

Report – Malaysia Profile. Accessed 2 Sept 2025. https://globalnutritionreport.org/resources/nutrition-profiles/asia/south-eastern-asia/malaysia/.

27 UNHCR. Accessed 2 Sept 2025. https://www.unhcr.org/my/what-we-do/figures-glance-malaysia. UNHCR Malaysia. May 2025, May. Figures at a glance – Malaysia. https://www.unhcr.org/my/what-we-do/figures-glance-malaysia; UNHCR Malaysia. June 2025. Annual Report 2024: Malaysia. https://www.unhcr.org/sites/default/files/2025-06/Malaysia%20ARR%202024.pdf.

28 UNHCR. Accessed 2 Sept 2025. https://www.unhcr.org/my/what-we-do/figures-glance-malaysia. UNHCR Malaysia. May 2025. Figures at a glance – Malaysia. https://www.unhcr.org/my/what-we-do/figures-glance-malaysia.

; UNHCR Malaysia. (2025, June). Annual Report 2024: Malaysia. https://www.unhcr.org/sites/default/files/2025-06/Malaysia%20ARR%202024.pdf.

29 Malaysiakini. Census 2020: Bumiputera population increases to almost 70pct.14 Feb 2022. https://www.malaysiakini.com/news/610656; Yunus, Arfa. The Star. Elderly population to hit 17% by 2040, says Stats Dept. 6 Sept. 2024. https://www.thestar.com.my/news/nation/2024/09/06/elderly-population-to-hit-17-by-2040-says-stats-dept. Current Population Estimates 2024. Accessed 15 Sept 2025, from https://www.dosm.gov.my/portal-main/release-content/current-population-estimates-2024.

30 Ministry of Health Malaysia, Institute for Public Health. (2018). National Health and Morbidity Survey (NHMS) 2018: Elderly Health—Volume I. Accessed 15 Sept 2025. https://iku.moh.gov.my/images/IKU/Document/REPORT/NHMS2018/NHMS2018ElderlyHealthVolume1.pdf.

31 Lee, Y., Mat Din, H., Wong, C. Y., Lai, W. T., & Koo, A. C. (2022). A study of female- and older adults-led households' telecommunication expenditure in digital Malaysia. Advances in Social Science, Education and Humanities Research, 655, 133–140. Atlantis Press. https://doi.org/10.2991/assehr.k.220306.019; Department of Statistics Malaysia (DOSM). (2024). Current Population Estimates 2024. https://www.dosm.gov.my/portal-main/release-content/current-population-estimates-2024.

32 Sadeka, S., Mohamad, M. S., & Sarkar, M. S. K. (2020). Disaster experiences and preparedness of the Orang Asli families in Tasik Chini of Malaysia: A conceptual framework towards building disaster resilient community. Progress in Disaster Science, 6, 100070. https://doi.org/10.1016/j.pdisas.2020.100070.

33 International Organization for Migration (IOM). July 2023. Malaysia: Country office. IOM. https://www.iom.int/countries/malaysia; Human Rights Watch. 5 March 2024. "We can't see the sun": Malaysia's arbitrary detention of migrants and refugees. Human Rights Watch. https://www.hrw.org/report/2024/03/05/we-cant-see-sun/malaysias-arbitrary-detention-migrants-and-refugees; International Organization for Migration. (2023). World Migration Report 2024: Chapter 3 – Asia. IOM. https://worldmigrationreport.iom.int/what-we-do/world-migration-report-2024-chapter-3/asia; Low, Choo Chin. (2024). Amnesty for Undocumented Migrants in Malaysia: Policy Development and Implementation since 2011. 6.1-19. https://www.researchgate.net/publication/380424792_Amnesty_for_Undocumented_Migrants_in_Malaysia_Policy_Development_and_Implementation_since_2011; Lee, H. A. 22 May 2025. Facilitating gainful labour migration in Southeast Asia remains an elusive task. ISEAS Perspective 2025/37. ISEAS – Yusof Ishak Institute. https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2025-37-facilitating-gainful-labour-migration-in-southeast-asia-remains-an-elusive-task-by-lee-hwok-aun/.

34 International Organization for Migration (IOM). Accessed 2 Sept 2025. Malaysia: Country office. IOM. https://www.iom.int/countries/malaysia; Bauchner, Shayna. Human Rights Watch. 5 March 2024. "We can't see the sun": Malaysia's arbitrary detention of migrants and refugees. Human Rights Watch. https://www.hrw.org/report/2024/03/05/we-cant-see-sun/malaysias-arbitrary-detention-migrants-and-refugees; International Organization for Migration. (2023). World Migration Report 2024: Chapter 3 – Asia. https://worldmigrationreport.iom.int/what-we-do/world-migration-report-2024-chapter-3/asia; Low, Choo Chin. April 2024. Amnesty for undocumented migrants in Malaysia: Policy development and implementation since 2011. https://www.researchgate.net/publication/380424792_Amnesty_for_Undocumented_Migrants_in_Malaysia_Policy_Development_and_Implementation_since_2011.

35 Tan, Yvonne. 23 May 2025. Tackling forced labour in Malaysia: Begins re-examining its migration model. Lowy Institute – The Interpreter. https://www.lowyinstitute.org/the-interpreter/tackling-forced-labour-malaysia-begins-re-examining-its-migration-model; Low, Choo Chin. (2024). Amnesty for Undocumented Migrants in Malaysia: Policy Development and Implementation since 2011. 6. 1-19. https://www.researchgate.net/publication/380424792_Amnesty_for_Undocumented_Migrants_in_Malaysia_Policy_Development_and_Implementation_since_2011/citation/download; Bauchner, Shayna. Human Rights Watch. 5 March 2024. "We can't see the sun": Malaysia's arbitrary detention of migrants and refugees. Human Rights Watch. https://www.hrw.org/report/2024/03/05/we-cant-see-sun/malaysias-arbitrary-detention-migrants-and-refugees.

36 Demery, David. Economic History Malaysia. On measuring relative poverty in Malaysia. Accessed 9 Sept 2025. https://www.ehm.my/publications/articles/on-measuring-relative-poverty-in-malaysia; World Bank Group. Malaysia Poverty and Equity Brief: October 2024 (English). https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099931101062517229.

37 Teoh, Wan Jool; Law, Leh Shii; Helmy, Hazmi; Stephen, Jeffery Anak; Cheah, Whye Lian; Salleh, Yolanda Anak. Household Food Insecurity among Indigenous Communities in Sarawak, Malaysia: Predictors and Coping Strategies. Indian Journal of Public Health 68(3):p380-386, Jul–Sep 2024. DOI: 10.4103/ijph.ijph_545_23, https://journals.lww.com/ijph/fulltext/2024/07000/household_food_insecurity_among_indigenous.8.aspx; Welsh, Bridget. The Vibes.com. Poverty Sabah's most pressing woe. 19 Sept 2020. https://www.thevibes.com/articles/opinion/189/PovertySabahsmostpressingwoe?s=08.

38 OKU Rights Matter Project, 2022-2025. Make The Right Real in Malaysia. Accessed 3 Sept 2025. Malaysian Disability Data. https://okurightsmatter.com/malaysian-disability-data/.

39 OKU Rights Matter Project, 2022-2025. Make The Right Real in Malaysia. Accessed 3 Sept 2025. Malaysian Disability Data. https://okurightsmatter.com/malaysian-disability-data; Human Rights Commission of Malaysia (SUHAKAM). 10 March 2025. Media statement no. 17/2025: SUHAKAM calls for enhanced safety and accessibility for persons with disabilities in public transport. https://suhakam.org.my/2025/03/media-statement-no-17-2025_su-

hakam-calls-for-enhanced-safety-and-accessibility-for-persons-with-disabilities-in-public-transport/; Ahmad, S., & Rahman, N. A. Dec 2021. Accessibility for persons with disabilities in built environment of urban area: Case study of George Town, Penang. ResearchGate. https://www.researchgate.net/publication/357427714_ACCESSIBILITY_FOR_PERSONS_WITH_DISABILITIES_IN_BUILT_ENVIRONMENT_OF_URBAN_AREA_CASE_STUDY_OF_GEORGE_TOWN_PENANG;

Khalid, F., & Lim, H. S. Jan 2016. Provisions of disabled facilities at the Malaysian public transport stations. ResearchGate. https://www.researchgate.net/publication/305309429_Provisions_of_Disabled_Facilities_at_The_Malaysian_Public_Transport_Stations.

40 Zaimi, N. H. A. Flood disasters in Malaysia: EXAMINING THE IMPACT ON OLDER PEOPLE'S VULNERABILITIES AND RIGHTS (IJCWED conference paper). Accessed 15 Sept. 2025. International Journal of Civil and Environmental Engineering Development. https://www.ijcwed.com/wp-content/uploads/2023/07/IJCWED18_301_1.pdf.

41 Suhardi, N. A. 12 Dec. 2019. Developing a design framework for disaster resilience flood evacuation centre in Malaysia. European Proceedings of Multidisciplinary Sciences, 12, 83–89. https://doi.org/10.15405/epms.2019.12.12;

The Vibes. 22 Oct. 2022. Group calls for PwD-friendly, accessible flood relief centres. The Vibes / Bernama. https://www.thevibes.com/articles/news/74971/group-calls-for-pwd-friendly-accessible-flood-relief-centres.

42 UNHCR Malaysia. May 2025. Figures at a glance — Malaysia. UNHCR. https://www.unhcr.org/my/what-we-do/figures-glance-malaysia.

43 Human Rights Watch. World Report 2025: Malaysia chapter. Human Rights Watch. Accessed 15 Sept. 2025. https://www.hrw.org/world-report/2025/country-chapters/malaysia.

44 UNHCR Malaysia. 28 May 2025. Malaysia Annual Results Report 2024. UNHCR. https://www.unhcr.org/sites/default/files/2025-06/Malaysia%20ARR%202024.pdf.

45 Verghis, S., Pereira, X., Kumar, A. G., Koh, A., & Singh-Lim, A. 31 March 2021. COVID-19 and refugees in Malaysia: An NGO response. Intervention, 19(1), 15–20. https://doi.org/10.4103/INTV.INTV_18_20; Fishbein, E., & Hkawng, J. T. 15 June 2020. "The fear is always with me": Refugees in Malaysia recount recent lockdowns and raids. New Naratif. https://pulitzercenter.org/stories/fear-always-me-refugees-malaysia-recount-recent-lockdowns-and-raids.

46 Hamid, H. A. and Muzafar, M. M. Khazanah Research Institute. 8 March 2024. Prioritise care and decent work agenda to accelerate 60% women workforce participation. https://www.krinstitute.org/assets/contentMS/img/template/editor/Views%20-%20KRI%20Women's%20Day%202024.pdf.

47 Le, L. J. & Xin, L. H. & Ganeson T. & Mohamad, S. N. & Aishah, S. N. Human Resource Management Academic Research Society. International Journal Academic Research in Business and Social Sciences. Domestic Violence in Malaysia During Post-Covid-19 Era: Any Legal Solution? 24 April 2024. https://hrmars.com/index.php/IJARBSS/article/view/21968/Domestic-Violence-in-Malaysia-During-Post-Covid-19-Era-Any-Legal-Solution.

48 Hamid, H. A. and Muzafar, M. M. Khazanah Research Institute. 8 March 2024. Prioritise care and decent work agenda to accelerate 60% women workforce participation. https://www.krinstitute.org/assets/contentMS/img/template/editor/Views%20-%20KRI%20Women's%20Day%202024.pdf.

49 The Official Portal of Parliament of Malaysian. 23 Jan 2013. https://www.parlimen.gov.my/pengenalan.html?&uweb=p&view=23&lang=en.

50 Reuters. 26 October 2023. Malaysia's unique rotational monarchy. https://www.reuters.com/world/asia-pacific/malaysias-unique-rotational-monarchy-2023-10-26; Institute of Strategic and International Studies (ISIS) Malaysia. 10 December 2019. Malaysia's constitutional fundamentals – No. 1 of a series of Tun Hussein Onn Chair in International Studies essays on the Federal Constitution. https://www.isis.org.my/2019/12/10/malaysias-constitutional-fundamentals-no-1-of-a-series-of-tun-hussein-onn-chair-in-international-studies-essays-on-the-federal-constitution-2; Welsh, B. (2024). Monarchy and democracy in modern Malaysia. In A. Hicken & E. M. Kuhonta (Eds.), The entrenchment of democracy (pp. 205–229). Cambridge: Cambridge University Press. https://doi.org/10.1017/9781009401673.011.

51 Ministry of Foreign Affairs, Malaysia. 20 July 2024. "Coronation of His Majesty Sultan Ibrahim as the 17th King of Malaysia." https://www.kln.gov.my/web/pak_islamabad/home/-/asset_publisher/h87VNOkiOwCJ/blog/coronation-of-his-majesty-sultan-ibrahim-as-the-17th-king-of-malays-3?inheritRedirect=false.

52 Wong, C. H., & Chin, J. 5 June 2012. Malaysia: Centralized Federalism in an Electoral One-Party State. In R. Saxena (Ed.), Varieties of Federal Governance. Cambridge University Press. https://www.cambridge.org/core/books/varieties-of-federal-governance/malaysia-centralized-federalism-in-an-electoral-oneparty-state/8803772BD3A1F8D9949F80CEA2D1C129; Reuters. 26 October 2023. Malaysia's unique rotational monarchy. https://www.reuters.com/world/asia-pacific/malaysias-unique-rotational-monarchy-2023-10-26; Institute of Strategic and International Studies (ISIS) Malaysia. 10 December 2019. Malaysia's constitutional fundamentals – No. 1 of a series of Tun Hussein Onn Chair in International Studies essays on the Federal Constitution. https://www.isis.org.my/2019/12/10/malaysias-constitutional-fundamentals-no-1-of-a-series-of-tun-hussein-onn-chair-in-international-studies-essays-on-the-federal-constitution-2; Welsh, B. (2024). Monarchy and democracy in modern Malaysia. In A. Hicken & E. M. Kuhonta (Eds.), The entrenchment of democracy (pp. 205–229). Cambridge: Cambridge University Press. https://doi.org/10.1017/9781009401673.011.

53 The Official Portal of Parliament of Malaysian. 23 Jan 2013. https://www.parlimen.gov.my/pengenalan.html?&uweb=p&view=23&lang=en; Local Government Act 1976 (Act 171) – GOV.MY PDF: https://www.doa.gov.my/doa/resources/info_doa/akta171_kerajaan_tempatan_1976.pdf; Federal Constitution (Perlembagaan Persekutuan, Cetakan Semula 2020) – JPM/BHEUU PDF. Accessed 30 Sept 2025. https://bhess.jpm.gov.my/wp-content/uploads/2024/06/Perlembagaan-Persekutuan-Cetakan-Semula-2020-1.pdf.

54 The Official Portal of Parliament of Malaysian. 23 Jan 2013. https://www.parlimen.gov.my/pengenalan.html?&uweb=p&view=23&lang=en; Government of Malaysia. (1979). Emergency (Essential Powers) Act 1979 (Act 216). Retrieved September 30, 2025, from https://www.rcrc-resilience-southeastasia.org/wp-content/uploads/2017/12/2016_civil_defence__amendment__act.pdf.

55 Zainal Azman Bin Abu Seman. (2017). Malaysia National Disaster Management Agency (NADMA) and its philosophy. Presented at ADRC Conference, 2017. https://www.adrc.asia/acdr/2017/documents/7%20Malaysia%20National%20Disaster%20Management%20Agency%20(NADMA)%20and%20its%20philosophy,%20Mr.%20Zainal%20Azman%20Bin%20Abu%20Seman,%20Deputy%20Director%20General,%20NADMA.pdf; RCRC-Resilience-Southeastasia.org. "Malaysia - National implementation of the ASEAN Agreement on Disaster Management and Emergency Response." Accessed 8 Sept 2025. https://www.rcrc-resilience-southeastasia.org/disaster-law/disaster-law-mapping-asean-agreement-on-disaster-management-and-emergency-response/country-profiles/malaysia/; Roosli, R. and O'Keefe, P. knowledge.aidr.org.au. (2012). "Learning and adaptation of disaster management and housing provision: the Malaysian experience." Accessed 8 Sept 2025. https://knowledge.aidr.org.au/resources/ajem-jul-2012-learning-and-adaptation-of-disaster-management-and-housing-provision-the-malaysian-experience/; Scribd. "NSC Directives 20." Accessed 8 Sept 2025. https://www.scribd.com/document/609983573/nsc-directives-20; National Disaster Management Agency (NADMA). (2024, October 4). NADMA Directive to guide disaster management and risk reduction. Retrieved September 30, 2025, from https://www.nadma.gov.my/bi/media-en/news/1294-nadma-directive-to-guide-disaster-management-and-risk-reduction-ahmad-zahid; National Disaster Management Agency (NADMA). (2024). Arahan NADMA No. 1 [Directive No. 1 PDF]. Retrieved 30 September 2025, from https://www.nadma.gov.my/images/2024/RujukanDalaman/Arahan_NADMA_No_1.pdf.

56 Zahid, A. National Disaster Management Agency (NADMA). 4 October 2024. Arahan NADMA No. 1 jadi panduan utama pengurusan bencana — Ahmad Zahid. https://www.nadma.gov.my/bi/media-en/news/1290-arahan-nadma-no-1-jadi-panduan-utama-pengurusan-bencana-ahmad-zahid; Fire and Rescue Department of Malaysia (IFCEM). Accessed 8 Sept 2025. Managing Natural Catastrophe: Malaysian Perspective [Slide deck]. https://ifcem.bomba.gov.my/portal/wp-content/uploads/2024/10/PAPER-7_-Senior-Supt.-I-Arjunaidi-1.pdf.

57 World Bank. World Bank Report Highlights Opportunities for Malaysia to Strengthen Economic Mobility on Path to High-Income Status. 4 Feb 2025. https://www.worldbank.org/en/news/press-release/2025/02/05/world-bank-report-highlights-opportunities-for-malaysia-to-strengthen-economic-mobility-on-path-to-high-income-status.

58 Ministry of Economy Department of Statistics Malaysia. Gross Domestic Product Income Approach 2024. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=gross-domestic-product-income-approach-2024&lang=English&; Bank Negra Malaysia. Economic and Financial Developments in Malaysia in the First Quarter of 2025. 16 May 2025. https://www.bnm.gov.my/-/qb25q1_en_pr; Bank Negra Malaysia. White Box. Revised Growth Forecast: Resilience amid Global Headwinds. 2Q 2025. https://www.bnm.gov.my/documents/20124/19010089/qb25q2_en_wb1.pdf.

59 World Bank Group. Exports of goods and services (% of GDP) – Malaysia. 2024. Accessed 10 Sept. 2025. https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?locations=MY; Bank Negara Malaysia. Economic and Financial Developments in Malaysia in the First Quarter of 2025. 16 May 2025. https://www.bnm.gov.my/-/qb25q1_en_pr; World Bank. Export of goods and services (% of GDP) – Malaysia. https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?locations=MY&; Ministry of Economy. Department of Statistics Malaysia. Poverty in Malaysia 2022. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=poverty-in-malaysia-&lang=English&.

60 OpenDOSM, Labour Markets 10 Sept 2025. https://open.dosm.gov.my/dashboard/labour-market; Ministry of Economy, Department of Statistics Malaysia. Employment Statistics, Fourth Quarter 2024. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=employment-statistics-fourth-quarter-2024&lang=English&; Bank Negara Malaysia. Economic and Financial Developments in Malaysia in the First Quarter of 2025. 16 May 2025. https://www.bnm.gov.my/-/qb25q1_en_pr; World Bank. Export of goods and services (% of GDP) – Malaysia. https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?locations=MY&; Ministry of Economy. Department of Statistics Malaysia. Poverty in Malaysia 2022. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=poverty-in-malaysia-&lang=English&; World Bank. Export of goods and services (% of GDP) – Malaysia. https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS?locations=MY&; Ministry of Economy. Department of Statistics Malaysia. Poverty in Malaysia 2022. https://www.dosm.gov.my/site/downloadrelease?admin_view=&id=poverty-in-malaysia-&lang=English&.

61 Abdullah, K., Tan, K. S., & Ghazali, N. H. M. (2005, July 3–7). No more in the comfort zone: Malaysia's response to the December 2004 tsunami. Paper presented at the International Hydrography and Oceanography Conference and Exhibition, Kuala Lumpur, Malaysia. Department of Irrigation and Drainage Malaysia. https://www.water.gov.my/jps/resources/auto%20download%20images/5844e31727ed4.pdf.

62 Hasan, H. H., Mohd Razali, S. F., Muhammad, N. S., & Ahmad, A. 24 Aug 2021. Hydrological Drought across Peninsular Malaysia: Implication of Drought Index. Natural Hazards and Earth System Sciences Discussions. https://doi.org/10.5194/nhess-2021-249. https://nhess.copernicus.org/preprints/nhess-2021-249/.

63 Huang, Y.F., Ng, J.L., Fung, K.F. et al. Space–time heterogeneity of drought characteristics in Sabah and Sarawak, East Malaysia: implications for developing effective drought monitoring and mitigation strategies. Appl Water Sci 13, 205. 21 Sept. 2023. https://doi.org/10.1007/s13201-023-01989-0. https://link.springer.com/article/10.1007/s13201-023-01989-0.

64 Zulkaffly, M. Z., & Abdul Rashid, F. I. (2021). Analysis on earthquake databases of the Sabah region and its application for seismic hazard assessment using the IMS data of the CTBTO [Poster]. CTBTO Science and Technology Conference. Malaysian Nuclear Agency. https://conferences.ctbto.org/event/7/contributions/1307/attachments/183/452/P5.2-451_Zolkaffly.pdf.

65 Ferrario, M. F. Landslides triggered by the 2015 Mw 6.0 Sabah (Malaysia) earthquake: inventory and ESI-07 intensity assignment. Natural Hazards and Earth System Sciences Preprints, 22(69). Accessed 11 Sept 2025. https://nhess.copernicus.org/preprints/nhess-2022-69/nhess-2022-69-manuscript-version3.pdf.

66 Nazaruddin, D.A., Duerrast, H. Intraplate earthquake occurrence and distribution in Peninsular Malaysia over the past 100 years. SN Appl. Sci. 3, 693. 9 June 2021. https://doi.org/10.1007/s42452-021-04686-2; Loi, D. W., Raghu-

nandan, M. E., & Swamy, V. and Raghunandan, M. E. 14 Sept 2018. Revisiting seismic hazard assessment for Peninsular Malaysia using deterministic and probabilistic approaches. Natural Hazards and Earth System Sciences, 18(9), 2387-2408. https://doi.org/10.5194/nhess-18-2387-2018.

67 Teh, S. Y., Koh, H. L., Moh, Y. T., DeAngelis, D. L., & Jiang, J. (2011). Tsunami risk mapping simulation for Malaysia. WIT Transactions on the Built Environment, 119, 3–14. https://doi.org/10.2495/DMAN110011; Pedersen, C., Latif, Z. A., & Lai, C. (2011). Tsunami modelling and risk mapping for east coast of Sabah, Malaysia. Coastal Engineering Proceedings, 1(32), currents.55. https://doi.org/10.9753/icce.v32.currents.55; Moon, W. C. (2022, August 8). A shared vision on the 2004 Indian Ocean tsunami in Malaysia: Hazard assessments, post-disaster measures and research. Journal of Marine Science and Engineering, 10(8), 1088. https://doi.org/10.3390/jmse10081088.

68 World Health Organization. Dengue Situation Update # 729: 04 September 2025. https://www.who.int/westernpacific/publications/m/item/dengue-situation-update---729--04-september-2025; WHO. Dengue Situation Update # 726: 24 July 2025. https://www.who.int/westernpacific/publications/m/item/dengue-situation-update---726--24-july-2025; WHO. Dengue Situation Update # 728: 21 August 2025. https://www.who.int/westernpacific/publications/m/item/dengue-situation-update---728--22-august-2025; iDengue version 3.0 for community. Copyright 2018 Malaysian Space Agency (MYSA), Ministry of Science, Technology and Innovation (MOSTI) and Disease Control Division (BKP), Ministry of Health Malaysia (MOH). https://idengue.mysa.gov.my/ide_v3/index.php?.

69 WHO. The Global Health Observatory. Accessed 10 Sept. 2025. https://www.who.int/data/gho/data/themes/malaria; WHO. Technical consultation on control of zoonotic malaria. Meeting report, Geneva, Switzerland. 5-7 November 2024. https://iris.who.int/bitstream/handle/10665/381500/9789240110854-eng.pdf?sequence=1&; Gasimov, E. WHO. Update on malaria elimination, including zoonotic malaria. 4-5 March 2025. https://cdn.who.int/media/docs/default-source/malaria/mpac-documentation/mpag-march2024-session7-elimination-including-zoonotic-malaria.pdf?sfvrsn=ba84c611_3&.

70 Tuberculosis in Malaysia: Disease timeline, epidemiology, control initiatives and outlook. https://www.mjpath.org.my/2025/v47n1/tuberculosis.pdf.

71 Cox, V. M., Jahis, R., Abu Bakar, R. S., Yusof, N. M., Pilay, K. P. V., Chem, Y. K., Selvanesan, S., Shamsudin, N., Hinsley, W., Blake, I. M., Hasran, N. Z., Rusli, N., Sam, I.-C., Chan, Y. F., & Pons-Salort, M. (2025). Spatio-temporal dynamics of hand, foot and mouth disease in Malaysia, 2009–2019. PLOS Neglected Tropical Diseases, 19(6), e0013174. https://doi.org/10.1371/journal.pntd.0013174.

72 Philip N, Ahmed K. Leptospirosis in Malaysia: current status, insights, and future prospects. J Physiol Anthropol. 2023 Dec 12;42(1):30. doi: 10.1186/s40101-023-00347-y; Azman, N. A., Rasudin, N. S., Atan, E. H., Abdul Ghafar, N., Ismail, R., & Dedy Chandra, N. D. S. (2025). The association of climatic pattern and leptospirosis cases in Malaysia from 2013 to 2021. Malaysian Journal of Pathology, 47(1), 77–84. https://www.mjpath.org.my/2025/v47n1/climatic-pattern-and-leptospirosis.pdf.

73 Toh TH, Lee JS, Dahian K, Toh AZ, Teh JH, Suhaili MR, Gray GC. Integrating One Health research in Sarawak, Malaysia: Addressing emerging and re-emerging infectious disease through international collaboration. One Health. 2025 Apr 1; 20:101027. doi: 10.1016/j.onehlt.2025.101027. PMID: 40242433; PMCID: PMC12002753. https://pmc.ncbi.nlm.nih.gov/articles/PMC12002753/.

74 Malaysian Meteorological Department. (2025). Malaysia's Climate. Ministry of Natural Resources and Environmental Sustainability. https://www.met.gov.my/en/pendidikan/iklim-malaysia/.

75 Muhammad, M. K. I., Hamed, M. M., Harun, S., Sa'adi, Z., Sammen, S. Sh., Al-Ansari, N., Shahid, S., & Scholz, M. 21 Feb. 2024. Heatwaves in Peninsular Malaysia: A spatiotemporal analysis. Scientific Reports, 14, Article 4255. https://doi.org/10.1038/s41598-024-53960-x. https://www.nature.com/articles/s41598-024-53960-x; Resilient Cities Network. 8 Sept. 2025. Too hot to ignore: Extreme heat in Malaysia is pushing communities to act. https://resilientcitiesnetwork.org/too-hot-to-ignore-extreme-heat-in-malaysia-is-pushing-communities-to-act/; Harakah Daily. Accessed 11 Sept 2025. The impact of global extreme heat and current hot weather on Malaysia. https://harakahdaily.net/2025/06/the-impact-of-global-extreme-heat-and-current-hot-weather-on-malaysia/.

76 Khazanah Research Institute. 18 Nov 2024. Navigating public health in a hotter Malaysia [Media Release]. https://www.krinstitute.org/assets/contentMS/img/template/editor/Media%20Release%20-%20Navigating%20Public%20Health%20in%20a%20Hotter%20Malaysia.pdf.

77 Resilient Cities Network. 8 Sept. 2025. Too hot to ignore: Extreme heat in Malaysia is pushing communities to act. https://resilientcitiesnetwork.org/too-hot-to-ignore-extreme-heat-in-malaysia-is-pushing-communities-to-act/.

78 Thaarshini Paramasivan dan and Dr. Syuhaida Ismail. Maritime Institute of Malaysia. 23 Jan 2025. Climate change and El Niño phenomenon heat up Malaysian waters. https://www.mima.gov.my/sea-views/climate-change-and-el-nino-phenomenon-heat-up-malaysian-waters.

79 Muhammad, M. K. I., Hamed, M. M., Harun, S., Sa'adi, Z., Sammen, S. Sh., Al-Ansari, N., Shahid, S., & Scholz, M. (2024). Heatwaves in Peninsular Malaysia: A spatiotemporal analysis. Scientific Reports, 14, Article 4255. https://doi.org/10.1038/s41598-024-53960-x. https://www.nature.com/articles/s41598-024-53960-x.

80 World Bank. 19 March 2024. Managing flood risks—Leveraging finance for business resilience in Malaysia. https://www.worldbank.org/en/country/malaysia/publication/flood-risk-management-leveraging-finance-for-business-resilience-in-malaysia.

81 Asian Disaster Reduction Center (ADRC) / National Disaster Management Agency (NADMA). (2024). Country Report: Malaysia (FY2024). https://www.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf; Rosmadi, H. S., Ahmed, M. F., Mokhtar, M. B., & Lim, C. K. 11 May 2023. Reviewing challenges of flood risk management in Malaysia. Water, 15(13), 2390. https://doi.org/10.3390/w15132390.

82 Latiff, R. 28 Jan 2022. Malaysia floods caused nearly $1.5 billion in losses, government report says. Reuters. https://www.reuters.com/world/asia-pacific/malaysia-floods-caused-nearly-15-bln-losses-govt-report-2022-01-28/; Rahman, S. 16 March 2022. Malaysia's Floods of December 2021: Can Future Disasters Be Avoided? ISEAS–Yusof Ishak Institute (Perspective 2022/26). https://www.iseas.edu.sg/wp-content/uploads/2022/03/

ISEAS_Perspective_2022_26.pdf.

83 Asian Disaster Reduction Center (ADRC) / National Disaster Management Agency (NADMA). (2024). Country Report: Malaysia (FY2024). https://www.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf.

84 Kazmi, D., Qasim, S., Harahap, I. S. H., & Syed Baharom. 1 June 2017. Landslide of Highland Towers 1993: A case study of Malaysia. Reliability Analysis + Fault Tree Analysis. https://www.researchgate.net/publication/317661643_Landslide_of_Highland_Towers_1993_a_case_study_of_Malaysia; Kazmi, D., Qasim, S., & Harahap, I. S. H. 30 Dec 2017. Analytical study of the causes of the major landslide of Bukit Antarabangsa in 2008 using Fault Tree Analysis. MATEC Web of Conferences, EACEF 2017. https://doi.org/10.1051/matecconf/201713804009.

85 Ab Rahman, A. A., Abd Majid, N., & Selamat, S. N. 1 Sept 2020. A Comprehensive Deriving the Factors of Landslide Happened in Malaysia. International Journal on Emerging Technologies, 11(5), 310-314. https://www.researchtrend.net/ijet/pdf/46%20A%20Comprehensive%20Deriving%20the%20Factors%20of%20Landslide%20Happened%20in%20Malaysia-3209-A.A.pdf; Akter, A., Megat Johari Megat Mohd Noor, M., Goto, M., Khanam, S., Parvez, A., & Rasheduzzaman, M. (June 2019). Landslide Disaster in Malaysia: An Overview. International Journal of Innovative Research & Development, 8(6). https://doi.org/10.24940/ijird/2019/v8/i6/JUN19058. https://www.researchgate.net/publication/335914009_Landslide_Disaster_in_Malaysia_An_Overview; Rahman, H. A., & Mapjabil, J. (2017). Landslides Disaster in Malaysia: an Overview. Health & the Environment Journal, 8(8-1), 58-71. https://www.researchgate.net/publication/321096764_Landslides_Disaster_in_Malaysia_an_Overview.

86 UNDRR, Disaster Risk Reduction in Malaysia: Status Report 2020, Bangkok, Thailand, United Nations Office for Disaster Risk Reduction (UNDRR), Regional Office for Asia and the Pacific, 2020, p 12, https://www.undrr.org/media/48531/download?startDownload=20251020; also published in Murakami, Satoshi, et al., Landslides Hazard Map in Malay Peninsula by Using Historical Landslide Database and Related Information, Journal of Civil Engineering Research 2014, 4(3A): 54-58, https://scispace.com/pdf/landslides-hazard-map-in-malay-peninsula-by-using-historical-nqvo4u5nhv.pdf — based on historical landslide data supplied by the Malaysia Public Works Department.

87 Lockard, C.A., Bee, O.J., Leinbach, T.R., Ahmad, Z.B. 12 September 2025. Malaysia. Encyclopedia Britannica. https://www.britannica.com/place/Malaysia.

88 NOAA. Tropical Cyclone Introduction. Accessed 12 Sept 2025. https://www.noaa.gov/jetstream/tropical/tropical-cyclone-introduction.

89 Wan Amrul Jaahiz Abd Razak, Muhammad Zahir Ramli, Nor Bakhiah Baharim, Syazana Md Shubri, Junainah Zakaria, Muhammad Fadhli Harris, Azizi Ali, Effi Helmy Ariffin, Storm surge induced by 2019 Tropical Storm Pabuk and impact on the shoreline in Kuala Nerus Terengganu, east coast of Peninsular Malaysia, Regional Studies in Marine Science, Volume 74, 2024, 103536, ISSN 2352-4855, https://doi.org/10.1016/j.rsma.2024.103536. (https://www.sciencedirect.com/science/article/pii/S2352485524001695); Ryan Lee, Christopher J. White, Mohammed Sarfaraz Gani Adnan, John Douglas, Miguel D. Mahecha, Fiachra E. O'Loughlin, Edoardo Patelli, Alexandre M. Ramos, Matthew J. Roberts, Olivia Martius, Enrico Tubaldi, Bart van den Hurk, Philip J. Ward, Jakob Zscheischler, Reclassifying historical disasters: From single to multi-hazards, Science of The Total Environment, Volume 912, 2024, 169120, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2023.169120. https://www.sciencedirect.com/science/article/pii/S0048969723077501; Ooi, S. H., Azizan, A., Nettukandy Chenoli, S., & Ammar, M. F. Jan 2017. Extreme rainstorms that caused devastating flood over the east coast of Peninsular Malaysia during November and December 2014. Weather and Forecasting, 32(3). https://doi.org/10.1175/WAF-D-16-0160.1. https://www.researchgate.net/publication/312971760_Extreme_rainstorms_that_caused_devastating_flood_over_the_east_coast_of_Peninsular_Malaysia_during_November_and_December_2014.

90 Moon, W.C.; Sidek, L.M.; Lau, T.L.; Puay, H.T.; Majid, T.A.; Wahab, A.K.A.; Teo, F.Y. 2004 Indian Ocean Tsunami in Malaysia. Encyclopedia. 17 Jun 2025. https://encyclopedia.pub/entry/26228. https://encyclopedia.pub/entry/26228; Bird, M., Cowie, S., Hawkes, A., Horton, B., MacGregor, C., Ong, J. E., Tan Shau Hwai, A., Teh Tiong Sa, & Yasin, Z. (2007). Indian Ocean tsunamis: Environmental and socio‐economic impacts in Langkawi, Malaysia. The Geographical Journal, 173(2), 103–117. https://doi.org/10.1111/j.1475-4959.2007.00224.x. https://www.researchgate.net/publication/227627694_Indian_Ocean_tsunamis_environmental_and_socio-economic_impacts_in_Langkawi_Malaysia.

91 Abdullah, K., Tan, K. S., & Ghazali, N. H. M. (2005, July 3–7). No more in the comfort zone: Malaysia's response to the December 2004 tsunami. Paper presented at the International Hydrography and Oceanography Conference and Exhibition, Kuala Lumpur, Malaysia. Department of Irrigation and Drainage Malaysia. https://www.water.gov.my/jps/resources/auto%20download%20images/5844e31727ed4.pdf.

92 Moon, W.C.; Sidek, L.M.; Lau, T.L.; Puay, H.T.; Majid, T.A.; Wahab, A.K.A.; Teo, F.Y. 31 July 2022. A Shared Vision on the 2004 Indian Ocean Tsunami in Malaysia: Hazard Assessments, Post-Disaster Measures and Research. J. Mar. Sci. Eng. 2022, 10, 1088. https://doi.org/10.3390/jmse10081088.

93 Sa'adi, Z., & Shahid, S. (2016). Peat fire susceptibility in Sarawak, Malaysia in the context of climate change. Proceedings of the 15th International Peat Congress (Abstract A-351, pp. 380-382). International Peatland Society. https://peatlands.org/assets/uploads/2019/06/ipc16p380-382a351saadishahid.pdf.

94 Mohd Samin, Ahmad Shalihin and Azmi, Nur Batrisyia Hadfina and Amil, Norhaniza and Leong, Yin-Hui and Tengku Muhammad, Tengku Sifzizul and Wen, Sheng and Latif, Mohd, Analysis of Smoke Reveals Peatland Fires in Peninsular Malaysia as Primary Source of Dioxins, Dioxin-Like Polychlorinated Biphenyls, and Air Pollution. Available at SSRN: https://ssrn.com/abstract=4940690 or http://dx.doi.org/10.2139/ssrn.4940690; Mohd Zahirasri Mohd Tohir & Dayang Nur Sakinah Musa. (June 2023). Situation Report – Malaysia. Wildfire Magazine / International Association of Wildland Fire. Accessed 12 Sept 2025 from https://www.iawfonline.org/article/situation-report-malaysia; Global Environment Facility. 23 January 2025. Malaysia shows what protecting and restoring peat swamp forests can yield. https://www.thegef.org/newsroom/blog/malaysia-shows-what-protecting-and-restoring-peat-swamp-forests-can-yield Global Environment Facility; Smith, T. E. L., Evers, S., Yule, C. M., & Gan, J. Y. 15 Dec 2017. In situ tropical peatland fire emission factors and their variability, as determined by field measurements in Peninsula Malaysia. Global Biogeochemical

Cycles, 32, 18–31. https://doi.org/10.1002/2017GB005709. https://agupubs.onlinelibrary.wiley.com/action/showCitFormats?doi=10.1002%2F2017GB005709.

95 Entry Criteria: Minimal Requirements for a Disaster to Be Entered in EM-DAT. The International Disaster Database. Centre for Research on the Epidemiology of Disasters (CRED). https://doc.emdat.be/docs/protocols/entry-criteria/. Accessed 29 October 2024.

96 CRED. EM-DAT. Data for Malaysia – all hazards – 2000-July 2025.

97 CRED. EM-DAT. Data for Malaysia – all hazards – 2000-July 2025.

98 Bernama. Situation in landslide, flood-affected Sabah improves, New Straits Times, 19 September 2025. https://www.nst.com.my/news/nation/2025/09/1277886/situation-landslide-flood-affected-sabah-improves

99 Malaysia - Floods (ADINet, MET Malaysia) (ECHO Daily Flash of 7 October 2025), ReliefWeb. https://reliefweb.int/report/malaysia/malaysia-floods-adinet-met-malaysia-echo-daily-flash-7-october-2025

100 Malaysia - Severe weather and floods (ADINet, MET Malaysia, media) (ECHO Daily Flash of 21 October 2025), ReliefWeb. https://reliefweb.int/report/malaysia/malaysia-severe-weather-and-floods-adinet-met-malaysia-media-echo-daily-flash-21-october-2025

101 Harris, E. and Hussain, H. Reuters. 3 March 2023. Flooding in southern Malaysia forces 40,000 people to flee homes. https://www.reuters.com/world/asia-pacific/flooding-southern-malaysia-forces-40000-people-flee-homes-2023-03-04/.

102 AHA Centre. FLASH UPDATE: No. 01 – Flooding in Malaysia and Southern Thailand – 28 November 2024. https://ahacentre.org/flash-update/flash-update-no-01-flooding-in-malaysia-and-southern-thailand-28-november-2024/

103 Harris, E. and Hussain, H. Reuters. 3 March 2023. Flooding in southern Malaysia forces 40,000 people to flee homes. https://www.reuters.com/world/asia-pacific/flooding-southern-malaysia-forces-40000-people-flee-homes-2023-03-04/.

104 Malaysian Red Crescent. Northeast Monsoon Flood 2024/2025, 0:23 video mark, https://redcrescent.org.my/disaster-response/northeast-monsoon-flood-2024/

105 Malaysia: Heat Wave - 03-2024 - Sabah and Peninsular Heat Wave #5 (2024-03-28), ReliefWeb, 29 March 2024. https://reliefweb.int/report/malaysia/malaysia-heat-wave-03-2024-sabah-and-peninsular-heat-wave-5-2024-03-28

106 The Edge Malaysia. 28 May 2025. Malaysia's water sector grapples with RM2b annual losses ... amid drought. https://theedgemalaysia.com/node/756977; BIMB Securities Research. 28 May 2025. Water Sector Thematic: Non-Revenue Water Analysis. BIMB Securities. https://cdn1.i3investor.com/my/files/dfgs88n/2025/06/04/1570660188--1579325027.pdf; Sipalan, J. 26 March 2024. In Malaysia's drought-hit Sabah, taps run dry – with more extreme heat expected. South China Morning Post. https://www.scmp.com/week-asia/economics/article/3256725/malaysias-drought-hit-sabah-taps-run-dry-more-extreme-heat-expected.

107 International Federation of Red Cross and Red Crescent Societies (IFRC). 17 November 2023. Malaysia: Dengue prevention and control – DREF Operation No. MDRMY010 [IFRC DREF final report]. ReliefWeb. https://reliefweb.int/report/malaysia/malaysia-dengue-prevention-and-control-dref-operation-ndeg-mdrmy010.

108 Harris, E. and Hussain, H. 3 March 2023. Flooding in southern Malaysia forces 40,000 people to flee homes. Reuters. https://www.reuters.com/world/asia-pacific/flooding-southern-malaysia-forces-40000-people-flee-homes-2023-03-04/.

109 Harris, E., & Latiff, R. 16 December 2022. Malaysia campsite landslide kills 21, including children. Reuters. https://www.reuters.com/world/asia-pacific/around-100-people-feared-trapped-malaysia-landslide-fire-department-2022-12-15/; Associated Press. 17 October 2023. Malaysia says landslide that killed 31 people last year was caused by heavy rain, not human activity. AP News. https://apnews.com/article/86e2600fa8a57d761eaa06cf2dfd3c20.

110 ECHO Daily Flash. Malaysia – Floods (ADINet, Floodlist, CatNat, MET Malaysia). 06 July 2022. https://erccportal.jrc.ec.europa.eu/ECHO-Products/Echo-Flash#/daily-flash-archive/4533; https://adinet.ahacentre.org/report/malaysia-flooding-in-baling-kedah-20220704

111 AHA Centre. Malaysia, Landslide in Kuala Lumpur. 11 Mar 2022. https://reliefweb.int/report/malaysia/malaysia-landslide-kuala-lumpur-11-mar-2022; https://adinet.ahacentre.org/report/malaysia-landslide-in-kuala-lumpur-20220311

112 ECHO. Malaysia - Landslide and floods (MetMalaysia, ADINet). 14 March 2022. https://erccportal.jrc.ec.europa.eu/ECHO-Products/Echo-Flash#/daily-flash-archive/4448; https://reliefweb.int/report/malaysia/malaysia-landslide-kuala-lumpur-11-mar-2022; https://adinet.ahacentre.org/report/malaysia-landslide-in-kuala-lumpur-20220311

113 AHA Centre. Malaysia, Flooding in Kelantan, Pahang, and Terengganu. 27 Feb 2022. https://reliefweb.int/report/malaysia/malaysia-flooding-kelantan-pahang-and-terengganu-27-feb-2022

114 Rahman, S. 16 March 2022. Malaysia's floods of December 2021: Can future disasters be avoided? (ISEAS Perspective 2022/26, 15 pages). ISEAS–Yusof Ishak Institute. https://www.iseas.edu.sg/wp-content/uploads/2022/03/ISEAS_Perspective_2022_26.pdf.

115 IFRC. Malaysia Floods: Final Report - DREF Operation No. MDRMY007. 24 March 2022. https://reliefweb.int/report/malaysia/malaysia-floods-dref-operation-n-mdrmy007-final-report

116 IFRC. Malaysia Floods: Final Report – DREF Operation No. MDRMY006. 27 November 2021. https://reliefweb.int/report/malaysia/malaysia-floods-dref-operation-n-mdrmy006-final-report

117 IFRC. Malaysia Floods: Final Report – Operation No. MDRMY005. 31 July 2021. https://reliefweb.int/report/malaysia/malaysia-floods-final-report-n-mdrmy005

118 ECHO. Malaysia - Flash floods (MET Malaysia, Floodlist, media). ECHO Daily Flash of 8 October 2020. https://reliefweb.int/report/malaysia/malaysia-flash-floods-met-malaysia-floodlist-media-echo-daily-flash-8-october-2020

119 ECHO. Malaysia - Floods and landslide (MET MY, media). ECHO Daily Flash of 10 November 2020. https://reliefweb.int/report/malaysia/malaysia-floods-and-landslide-met-my-media-echo-daily-flash-10-november-2020

120 AHA Centre. Malaysia, Flooding in Terangganu. 23

November 2020. https://reliefweb.int/report/malaysia/malaysia-flooding-terangganu-0915-nov-23-2020

121 ECHO. Malaysia - Floods (Met Malaysia, media). ECHO Daily Flash of 26 November 2020. https://reliefweb.int/report/malaysia/malaysia-floods-met-malaysia-media-echo-daily-flash-26-november-2020

122 AHA Centre. Malaysia, Flooding in Betong district (Sarawak state). 11 May 2020. https://reliefweb.int/report/malaysia/malaysia-flooding-betong-district-sarawak-state-1949-may-11-2020

123 ECHO. Malaysia - Floods (MET Malaysia, media). ECHO Daily Flash of 18 May 2020. https://reliefweb.int/report/malaysia/malaysia-floods-met-malaysia-media-echo-daily-flash-18-may-2020

124 AHA Centre. Malaysia, Flooding in Johor State, Muar, Batu Pahat, Tangkak, Kluang, Pontian Districts in Johor. 21 June 2020. https://reliefweb.int/report/malaysia/malaysia-flooding-johor-state-1200-jun-21-2020-muar-batu-pahat-tangkak-kluang

125 ECHO. Malaysia - Floods (DG ECHO, MetMalaysia, Floodlist, media). ECHO Daily Flash of 1 July 2020. https://reliefweb.int/report/malaysia/malaysia-floods-dg-echo-metmalaysia-floodlist-media-echo-daily-flash-1-july-2020

126 IFRC. Operation Update Report Malaysia: Floods Operation update n° 3 (DREF n° MDRMY004). 6 May 2020. https://reliefweb.int/report/malaysia/operation-update-report-malaysia-floods-operation-update-n-3-dref-n-mdrmy004

127 Che Siti Noor Binti Che Mamat. (2024). Malaysia Country Report FY2024 (Visiting Researcher Program). National Disaster Management Agency (NADMA) & Asian Disaster Reduction Centre. https://www.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf.

128 Malaysia Reports 130,000 Dengue Cases In 2019, Highest Since 2015, CodeBlue, 3 January 2020. https://codeblue.galencentre.org/2020/01/malaysia-reports-130000-dengue-cases-in-2019-highest-since-2015/

129 Ahmad Zaki R, Xin NZ. Dengue Trend During COVID-19 Pandemic in Malaysia. Asia Pac J Public Health. 2023 Jan;35(1):62-64. doi: 10.1177/10105395221134655. Epub 2022 Nov 5. PMID: 36341513; PMCID: PMC9637901. https://pmc.ncbi.nlm.nih.gov/articles/PMC9637901/

130 WHO. Dengue in the Southeast Asia. Accessed 12 August 2022. https://www.who.int/southeastasia/health-topics/dengue-and-severe-dengue

131 Two dead, nearly 12,000 evacuated in Malaysia floods, The Straits Times, 5 January 2018. https://www.straitstimes.com/asia/se-asia/two-dead-nearly-12000-evacuated-in-malaysia-floods

132 ADINet. Flash floods in Northern Malaysia (Kedah, Penang, Perak). 14 November 2017. https://adinet.ahacentre.org/report/flash-floods-in-northern-malaysia-kedah-penang-perak-20171114

133 IFRC. Malaysia: Seasonal Flooding - Information Bulletin n° 1." 5 January 2017. https://reliefweb.int/report/ malaysia/malaysia-seasonal-flooding-information-bulletin-n-1

134 Today Online. Malaysia warns of continuing drought as Malacca sounds water shortage alarm. 28 April 2016. https://www.todayonline.com/world/asia/second-death-heatstroke-malaysia

135 Mercy Malaysia. Flood Emergency Response -- Kg. Tabakang And Kg. Sorak Melayu, Serian, February 2016. https://www.mercy.org.my/programme/flood-emergency-response/

136 AP. More Bodies Found on Malaysia Mountain as Quake Toll Hits 13. 6 June 2015. https://www.nbcnews. com/news/world/more-bodies-found-malaysia-mountainquake-toll-hits-13-n371051

137 Photo by IFRC/Fadza Ishak. IFRC, Malaysian 2021 Floods: In Pictures, 15 January 2021.

https://www.ifrc.org/article/malaysian-2021-floods-pictures

138 Che Siti Noor binti Che Mamat. Country Report: Malaysia, Visiting Researcher Program FY2024, Asian Disaster Reduction Centre. https://web.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf

139 NADMA Directive No. 1, https://www.nadma.gov.my/images/2024/RujukanDalaman/Arahan_NADMA_No_1.pdf ; MHEWC, Malaysia, NADMA, https://www.mhewc.org/malaysia/

140 Che Siti Noor binti Che Mamat. Country Report: Malaysia, Visiting Researcher Program FY2024, Asian Disaster Reduction Centre. https://www.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf

141 NADMA. Leading Disaster Management Agency. Accessed 17 September 2025. https://www.nadma.gov.my/bm/korporat/perkhidmatan-teras/agensi-peneraju-pengurusan-bencana

142 National Disaster Management Agency (NADMA Malaysia; Agensi Penguruan Bancana Negara). Strategic Plan (Pelan Strategik) NADMA 2024-2028. https://www.nadma.gov.my/images/2025/TerbitanDalaman/PELAN_STRATEGIK_NADMA_2024-2028.pdf

143 Dhesegaan Bala Krishnan. Highland Towers, 30 years on: Heavy rains still rattle survivors but nation better prepared for disasters, Malay Mail, 11 December 2023. https://www.malaymail.com/news/malaysia/2023/12/09/highland-towers-30-years-on-heavy-rains-still-rattle-survivors-but-nation-better-prepared-for-disasters/106676

144 The Star. From tragedy to triumph: How SMART became a global search and rescue force, 29 March 2025. https://www.thestar.com.my/news/nation/2025/03/29/from-tragedy-to-triumph-how-smart-became-a-global-search-and-rescue-force

145 Malaysia NADMA. Civil Agencies Assistance in Humanitarian Assistance and Disaster Relief (HADR), Exercise Cobra Gold - HADR TTX, Pattaya, Thailand, February 2025.

146 Malaysia.gov.my. THE APPLICATION OF DEFENCE GEOSPATIAL INFORMATION MANAGEMENT SYSTEM (DGIM) IN DISASTER MANAGEMENT. Accessed 8 Sept 2025. https://www.malaysia.gov.my/portal/content/31326.

147 Abid, S. K., Sulaiman, N., Al-Wathinani, A. M., & Goniewicz, K. 20 Dec. 2024. Community-based flood mitigation in Malaysia: Enhancing public participation and policy effectiveness for sustainable resilience. Journal of Global Health, 14, Article 04290. https://doi.org/10.7189/jogh.14.04290.

148 Datuk Khairul Shahril Idrus. NADMA: National Disaster Risk Reduction Policy 2030 For A Safer Malaysia, 10 September 2024. https://www.bernama.com/en/news.php?id=2349710

149 National Disaster Management Agency (NADMA Malaysia; Agensi Penguruan Bancana Negara). Strategic Plan

(Pelan Strategik) NADMA 2024-2028. https://www.nadma.gov.my/images/2025/TerbitanDalaman/PELAN_STRATEGIK_NADMA_2024-2028.pdf

150 Che Siti Noor binti Che Mamat. Country Report: Malaysia, Visiting Researcher Program FY2024, Asian Disaster Reduction Centre. https://web.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf

151 NADMA. NADMA Directive No. 1 (in Bahasa Malay). https://www.nadma.gov.my/images/2024/RujukanDalaman/Arahan_NADMA_No_1.pdf

152 Angkatan Pertahanan Awam Malaysia. SPIDER Team, https://www.civildefence.gov.my/spider-team/?lang=en

153 Che Siti Noor binti Che Mamat. Country Report: Malaysia, Visiting Researcher Program FY2024, Asian Disaster Reduction Centre. https://web.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf

154 Nurhan Norris Ma, Aida Jaffar, Halyna Lugova, Badrul Hisham Abd Samad, Mohd Rashidi Abdul Salam, Ambigga Krishnapillai. Civil-Military Coordination for Health Response to Urban Disaster in Malaysia: Document Analysis, International Journal of Academic Research in Business and Social Sciences, Vol 14, Issue 7 (2024), DOI:10.6007/IJARBSS/v14-i7/21888, p. 370. https://kwpublications.com/papers_submitted/10903/civil-military-coordination-for-health-response-to-urban-disaster-in-malaysia-document-analysis.pdf

155 Email communication from scholars at National Defence University, Malaysia; 3 November 2025.

156 T.n. Alagesh. Armed Forces personnel, assets ready for monsoon floods, New Straits Times, 19 September 2025. https://www.nst.com.my/news/nation/2025/09/1277937/armed-forces-personnel-assets-ready-monsoon-floods

157 Bernama. Situation in landslide, flood-affected Sabah improves, New Straits Times, 19 September 2025. https://www.nst.com.my/news/nation/2025/09/1277886/situation-landslide-flood-affected-sabah-improves

158 Malay Mail. Malaysian Armed Forces ready for monsoon season, pledges rapid response to flood-hit areas, says Mohd Nizam, 20 September 2025. https://www.malaymail.com/news/malaysia/2025/09/20/malaysian-armed-forces-ready-for-monsoon-season-pledges-rapid-response-to-flood-hit-areas-says-mohd-nizam/191765

159 Jessie Yeung and Reuters. Malaysia floods: 8 dead and 32,000 displaced after torrential rain, CNN, 21 December 2021, https://www.cnn.com/2021/12/21/asia/malaysia-floods-dead-displaced-intl-hnk; A short summary of 2021 The Great Klang Valley Flood, Insight, 20 December 2021, https://insight.estate123.com/2021/12/20/a-short-summary-of-2021-the-great-klang-valley-flood/

160 Bernama. MAF assets, personnel mobilised to assist relief efforts in flood-hit areas, AWANI International, 18 December 2021. https://international.astroawani.com/malaysia-news/maf-assets-personnel-mobilised-assist-relief-efforts-floodhit-areas-337154

161 Malaysia Military Times. Malaysian Armed Forces Deploys Medical Team for Search and Rescue Mission Following Myanmar Earthquake, 30 March 2025. https://mymilitarytimes.com/index.php/2025/03/30/malaysian-armed-forces-deploys-medical-team-for-search-and-rescue-mission-following-myanmar-earthquake/

162 The Star. Malaysia deploys 50-member humanitarian team to Myanmar following deadly quake, 29 March 2025. https://www.thestar.com.my/aseanplus/asean-plus-news/2025/03/29/malaysia-deploys-50-member-humanitarian-team-to-myanmar-following-deadly-quake

163 Photo Credit: National Disaster Management Agency, Prime Minister's Department, Malaysia. Published in: Malaysia's Smart Heroes in Action: MAS01 MyTeam Relief Operation to the Myanmar Earthquake 2025, The ASEAN Magazine, Special Issue 46/October 2025, 15 October 2025. https://theaseanmagazine.asean.org/article/malaysias-smart-heroes-in-action-mas01-myteam-relief-operation-to-the-myanmar-earthquake-2025/

164 Che Siti Noor binti Che Mamat. Country Report: Malaysia, Visiting Researcher Program FY2024, Asian Disaster Reduction Centre. https://web.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf

165 UNDRR. Chart of the Sendai Framework for Disaster Risk Reduction 2015-2030. https://www.undrr.org/publication/chart-sendai-framework-disaster-risk-reduction-2015-2030

166 UN. Sustainable Development: The 17 Goals. https://sdgs.un.org/goals

167 Preventing Conflict, Transforming Justice, Security the Peace: A Global Study on the Implementation of UN Security Council Resolution 1325, 2015. https://wps.unwomen.org/pdf/en/GlobalStudy_EN_Web.pdf

168 Marie O'Reilly, Andrea O'Suilleabhain, Thania Paffenholz. Reimagining Peacemaking: Women's Roles in Peace Processes, International Peace Institute, June 2015, pg 12, 34. https://www.ipinst.org/wp-content/uploads/2015/06/IPI-E-pub-Reimagining-Peacemaking.pdf

169 Malay Mail. Fadillah: Malaysia's first women, peace and security plan marks milestone for Asean role, 9 September 2025. https://www.malaymail.com/news/malaysia/2025/09/09/fadillah-malaysias-first-women-peace-and-security-plan-marks-milestone-for-asean-role/190546

170 Government of Malaysia. National Action Plan on Women, Peace and Security 2025-2030. https://wps.asean.org/wp-content/uploads/2025/09/NAP-WPS-Malaysia_compressed.pdf

171 ASEAN. About ASEAN, accessed 14 October 2025. https://asean.org/about-asean/

172 Malay Mail. Anwar confirms Timor-Leste to officially join Asean as full member on October 26, 11 October 2025. https://www.malaymail.com/news/malaysia/2025/10/11/anwar-confirms-timor-leste-to-officially-join-asean-as-full-member-on-october-26/194228

173 AHA Centre. About us. Accessed 10 October 2025. https://ahacentre.org/about-us/

174 AHA Centre. Guidelines: ASEAN-ERAT, Version 5.0, October 2024. https://ahacentre.org/publication/asean-erat-guidelines/

175 Madiatri Silalahi. 12 YEARS OF THE ASEAN-ERAT MISSIONS, The Column, Vol 67, AHA Centre, 2020. https://thecolumn.ahacentre.org/insight/vol-67-12-years-of-the-asean-erat-missions/

176 AHA Centre. ASEAN Emergency Response and Assessment Team (ASEAN-ERAT): Solidarity in Action, Knowledge Series Book 4, 2017. https://ahacentre.org/wp-content/uploads/2017/05/Digital-Format-4-ASEAN-ERAT.pdf

177 AHA Centre. Guidelines: ASEAN-ERAT, Version 5.0, October 2024. https://ahacentre.org/publication/asean-erat-guidelines/

178 AHA Centre. DELSA: Disaster Emergency Logistics System for ASEAN (Fact Sheet), 2018. https://ahacentre.org/wp-content/uploads/2018/01/DIGITAL-Version-FACT-SHEETS-DELSA.pdf

179 Australian Government Department of Foreign Affairs and Trad. East Asia Summit (EAS), 2025. https://www.dfat.gov.au/international-relations/regional-architecture/eas/east-asia-summit-eas

180 ASEAN. Chairman's Statement of the 5th East Asia Summit Foreign Ministers' Meeting, Kuala Lumpur, 6 August 2015. https://asean.org/wp-content/uploads/2021/09/Chairmans-Statement-of-the-5th-East-Asia-Summit-Foreign-Ministers-Meeting-6-August-2015.pdf

181 Australian Government Department of Home Affairs. 2018 East Asia Summit International Disaster Assistance Workshop Outcomes Report, 2018. https://www.homeaffairs.gov.au/emergency/files/2018-eas-international-disaster-assist.pdf

182 EAS Toolkit 1: National Focal Point Table, International Red Cross and Red Crescent Movement, 2015. https://www.rcrc-resilience-southeastasia.org/wp-content/uploads/2018/01/2015-EAS-Toolkit-1-National-Focal-Point-Table.pdf

183 EAS Toolkit 2: Guidance for Rapid Disaster Response, International Red Cross and Red Crescent Movement, 2015. https://www.rcrc-resilience-southeastasia.org/wp-content/uploads/2018/01/2015-EAS-Toolkit-2-Guidance-for-Rapid-Disaster-Response.pdf

184 EAS Toolkit 3: Country Disaster Response Arrangements, International Red Cross and Red Crescent Movement, 2015. https://www.asean.org/wp-content/uploads/images/2015/June/EAS_toolkit/EAS-Toolkit-3.pdf

185 Commonwealth of Australia and the Republic of Indonesia. Preliminaries: An Overview of the East Asia Summit Rapid Disaster Response Toolkit, 2015. https://www.rcrc-resilience-southeastasia.org/wp-content/uploads/2018/01/2015-EAS-Preliminaries-for-the-Rapid-Disaster-Response-Toolkit.pdf

186 UNSDG. Malaysia (MCO). https://unsdg.un.org/un-in-action/malaysia-mco

187 United Nations Country Team in Malaysia. Country Analysis for Malaysia, May 2025, p. 7, https://malaysia.un.org/en/298806-un-country-analysis-ca-malaysia

188 UN in Malaysia, Singapore and Brunei Darussalam. UN Country Results Report Malaysia 2024: Consolidating SDG Progress and Enabling Malaysia's Development Transition, 2024, p. 3. https://malaysia.un.org/en/293678-un-country-results-report-malaysia-2024-consolidating-sdg-progress-and-enabling-malaysia%E2%80%99s

189 IFRC. Malaysia IFRC Country Plan, 2022. https://www.ifrc.org/sites/default/files/2022-02/Malaysia_Country_Plan_2022.pdf

190 IFRC. Malaysia 2024-2025 IFRC Network Country Plan, 12 August 2024. https://go-api.ifrc.org/api/DownloadFile/88512/Malaysia_INP_2024

191 Malaysian Red Crescent. 2024 Annual Report. https://redcrescent.org.my/annual-report/

192 IFRC. Malaysia IFRC Country Plan, 2022. https://www.ifrc.org/sites/default/files/2022-02/Malaysia_Country_Plan_2022.pdf

193 IFRC. Malaysia 2024-2025 IFRC Network Country Plan, 12 August 2024. https://go-api.ifrc.org/api/DownloadFile/88512/Malaysia_INP_2024

194 Malaysian Red Crescent. Malaysian Red Crescent Contributes to 15 Tonne Joint Humanitarian Aid for Earthquake Hit Myanmar, 7 /April 2025. https://redcrescent.org.my/malaysian-red-crescent-contributes-to-15tonne-joint-humanitarian-aid-for-earthquakehit-myanmar/

195 Malaysian Red Crescent. Strategy 2030, https://redcrescent.org.my/strategy-2030/

196 IFRC. DREF MDRMY011 Final Report: Malaysia Flood 2024, ReliefWeb, 1 October 2025. https://reliefweb.int/report/malaysia/dref-mdrmy011-final-report-malaysia-flood-2024

197 IFRC. Malaysia 2024-2025 IFRC Network Country Plan, 12 August 2024. https://go-api.ifrc.org/api/DownloadFile/88512/Malaysia_INP_2024

198 ICRC Malaysia, Singapore & Brunei. Facebook post, 10 January 2024. https://www.facebook.com/ICRCmy/posts/we-are-pleased-to-announce-the-appointment-of-clara-chooi-as-the-new-icrc-head-o/688130556830816/

199 IFRC. Malaysia 2024-2025 IFRC Network Country Plan, 12 August 2024. https://go-api.ifrc.org/api/DownloadFile/88512/Malaysia_INP_2024

200 MyCARE. Introduction. Accessed 4 November 2025. https://www.mycare.org.my/introduction/

201 MyCARE. Our Work – Rohingya Community in Malaysia. Accessed 4 November 2025. https://www.mycare.org.my/category/our-work/projects-campaigns/rohingya-community-in-malaysia/

202 Islamic Relief Malaysia. About Us – Who We Are, accessed 9 October 2025. https://islamic-relief.org.my/who-are-we-3/#

203 Malaysian Relief Agency. About Us, accessed 8 October 2025. https://mra.my/about-us/

204 NADMA. Over RM429,000 in flood aid distributed to seven states, says M'sian Relief Agency, 14 December 2024. https://www.nadma.gov.my/bi/media-en/news/2041-over-rm429-000-in-flood-aid-distributed-to-seven-states-says-m-sian-relief-agency

205 MERCY MALAYSIA. Home – Global Presence, accessed 8 October 2025. https://mercy.org.my/

206 MERCY Malaysia. Who We Are, accessed 8 October 2025. https://mercy.org.my/who-we-are/

207 Taiwan Buddhist Tzu-Chi Foundation Malaysia. Origins. Accessed 4 November 2025. https://www.tzuchi.my/en/about-us/tzuchi-malaysia/origins

208 Taiwan Buddhist Tzu-Chi Foundation Malaysia. Our Work. Accessed 4 November 2025. https://www.tzuchi.my/en/about-us/tzuchi-malaysia/our-work

209 Taiwan Buddhist Tzu-Chi Foundation Malaysia. 2021 Flood. Accessed 4 November 2025. https://www.tzuchi.my/en/projects/2021flood

210 Ministry of Transport. National Transport Policy 2019-2030. https://dpn.mot.gov.my/bukuDPNEn

211 CIA World Factbook. Malaysia - Transportation. Ac-

cessed 9 September 2025. https://www.cia.gov/the-world-factbook/countries/malaysia/#transportation

212 Ministry of Transport Malaysia. List of Airports. Accessed 9 September 2025. https://www.mot.gov.my/en/aviation/infrastructure/list-of-airports

213 Ministry of Transport. Aviation Safety. Accessed 9 September 2025. https://www.mot.gov.my/en/aviation/safety

214 Ministry of Transport. Kuala Lumpur International Airport. https://www.mot.gov.my/en/aviation/infrastructure/list-of-airports/KLIA

215 Malaysian Investment Development Authority. Chapter 9 Infrastructure Support. https://www.mida.gov.my/wp-content/uploads/2020/07/Chapter-9-Infrastructure-Support-1.pdf

216 KLIA.Info. Kuala Lumpur International Airport. https://klia.info/; Ministry of Transport. Kuala Lumpur International Airport (KLIA). https://www.mot.gov.my/en/aviation/infrastructure/list-of-airports/KLIA

217 Ministry of Transport. Lapangan Terbang Antarabangsa Kota Kinabalu (KKIA). https://www.mot.gov.my/en/aviation/infrastructure/list-of-airports/KKIA; Malaysia Airports. Kota Kinabalu International Airport. https://www.malaysiaairports.com.my/en/about-us/corporate-profile/our-airports

218 Ministry of Transport. Kuching International Airport (KIA). https://www.mot.gov.my/en/aviation/infrastructure/list-of-airports/KIA

219 Bernama. Malay Mail. Subang Air Base marks 40 years as RMAF's backbone for defence and humanitarian missions. 4 October 2025. https://www.malaymail.com/news/malaysia/2025/10/04/subang-air-base-marks-40-years-as-rmafs-backbone-for-defence-and-humanitarian-missions/193376; Bernama. Subang Air Base Plays Vital Role in Defence, Humanitarian Missions – RMAF Chief. 4 October 2025. https://www.bernama.com/en/news.php?id=2474645

220 World Food Program (WFP). UN Humanitarian Response Depot. https://www.wfp.org/unhrd

221 United Nations Humanitarian Response Depot (UNHRD). Our Services. https://unhrd.org/our-services

222 World Airport Codes. Accessed 15 September 2025. https://www.world-airport-codes.com/; Malaysia Airports. Accessed 15 September 2025. https://www.malaysiaairports.com.my/en/about-us/corporate-profile/our-airports; Ministry of Transport Malaysia. List of Airports. Accessed 15 September 2025. https://www.mot.gov.my/en/aviation/infrastructure/list-of-airports; Senai Airport. Airport Operations. Accessed 15 September 2025. https://www.senaiairport.com/corporate/airport-operations/airport-fact-sheet; Miri airport guide. Quick Facts. Accessed 15 September 2025. https://www.miriairport.com/miri-airport-quick-facts/; ACU-KWIK Global Airport and FBO Information/Data Resource. https://acukwik.com/

223 Mohd Azmi Embong. Welcome to Port Klang Authority Asia's Preferred Logistics Hub. Port Klang Authority. 29 November 2023. https://www.unescap.org/sites/default/d8files/event-documents/3_Smart-Port-Development-Strategies-Digitalization_Malaysia.pdf

224 The Star. Port Klang ranks 10th among world's busiest container ports. 1 September 2025. https://www.thestar.com.my/news/nation/2025/09/01/port-klang-ranks-10th-among-world039s-busiest-container-ports

225 CIA World Factbook. Malaysia - Transportation. Accessed 9 September 2025. https://www.cia.gov/the-world-factbook/countries/malaysia/#transportation

226 Ministry of Transport Malaysia. Maritime Infrastructure. Accessed 16 September 2025. https://www.mot.gov.my/en/maritime/infrastructure; Ministry of Transport Malaysia. Development and Administration of Ports. Accessed 16 September 2025. https://www.mot.gov.my/en/maritime/infrastructure/development-administration-of-ports

227 Malaysian Investment Development Authority. Chapter 9 Infrastructure Support. https://www.mida.gov.my/wp-content/uploads/2020/07/Chapter-9-Infrastructure-Support-1.pdf

228 Mohd Azmi Embong. Welcome to Port Klang Authority Asia's Preferred Logistics Hub. Port Klang Authority. 29 November 2023. https://www.unescap.org/sites/default/d8files/event-documents/3_Smart-Port-Development-Strategies-Digitalization_Malaysia.pdf

229 Industrial Malaysia. Guide to Port Klang, Selangor: The Busiest Port in Malaysia. https://www.industrialmalaysia.com.my/key-industrial-areas/port-klang; Mohd Azmi Embong. Welcome to Port Klang Authority Asia's Preferred Logistics Hub. Port Klang Authority. 29 November 2023. https://www.unescap.org/sites/default/d8files/event-documents/3_Smart-Port-Development-Strategies-Digitalization_Malaysia.pdf

230 Industrial Malaysia. Top Industrial Zones Located Near ECRL Route and Stations. https://www.industrialmalaysia.com.my/industrial-insights/ecrl-malaysia

231 Industrial Malaysia. Guide to Port Klang, Selangor: The Busiest Port in Malaysia. https://www.industrialmalaysia.com.my/key-industrial-areas/port-klang

232 Industrial Malaysia. Guide to Port Klang, Selangor: The Busiest Port in Malaysia. https://www.industrialmalaysia.com.my/key-industrial-areas/port-klang

233 MMC Ports. Southpoint sets new record in monthly cargo handling throughput. https://www.mmcports.com.my/southpoint-sets-new-record-in-monthly-cargo-handling-throughput/

234 The Star. Port Klang ranks 10th among world's busiest container ports. 1 September 2025. https://www.thestar.com.my/news/nation/2025/09/01/port-klang-ranks-10th-among-world039s-busiest-container-ports

235 Global Track Lines. 7 Major Sea Ports in Malaysia for Sea Shipments. https://globaltracklines.com/blog/major-sea-ports-in-malaysia-for-sea-shipments/

236 The Star. Port Klang ranks 10th among world's busiest container ports. 1 September 2025. https://www.thestar.com.my/news/nation/2025/09/01/port-klang-ranks-10th-among-world039s-busiest-container-ports

237 Global Track Lines. 7 Major Sea Ports in Malaysia for Sea Shipments. https://globaltracklines.com/blog/major-sea-ports-in-malaysia-for-sea-shipments/; Dimerco. Get to know Malaysia's Ports. 8 September 2023. https://dimerco.com/blog-post/get-to-know-malaysias-ports/

238 Global Track Lines. 7 Major Sea Ports in Malaysia for Sea Shipments. https://globaltracklines.com/blog/major-sea-ports-in-malaysia-for-sea-shipments/; Dimerco. Get to know Malaysia's Ports. 8 September 2023. https://dimerco.com/blog-post/get-to-know-malaysias-ports/

239 Global Track Lines. 7 Major Sea Ports in Malaysia for Sea Shipments. https://globaltracklines.com/blog/major-

sea-ports-in-malaysia-for-sea-shipments/; Joshi, Rishab. 7 Major Ports in Malaysia. Marineinsight.com. 26 March 2022. https://www.marineinsight.com/know-more/7-major-ports-in-malaysia/

240 Global Track Lines. 7 Major Sea Ports in Malaysia for Sea Shipments. https://globaltracklines.com/blog/major-sea-ports-in-malaysia-for-sea-shipments/; Joshi, Rishab. 7 Major Ports in Malaysia. Marineinsight.com. 26 March 2022. https://www.marineinsight.com/know-more/7-major-ports-in-malaysia/

241 Global Track Lines. 7 Major Sea Ports in Malaysia for Sea Shipments. https://globaltracklines.com/blog/major-sea-ports-in-malaysia-for-sea-shipments/; Joshi, Rishab. 7 Major Ports in Malaysia. Marineinsight.com. 26 March 2022. https://www.marineinsight.com/know-more/7-major-ports-in-malaysia/

242 Ministry of Works. Profile. Accessed 2 September 2025. https://www.kkr.gov.my/ms/mengenai-kkr/profil

243 Mohammed Zain Ruzaidin , Mohd Zahari Haliza , Mohd Zainol Noor Azmi. Inter-agency information sharing coordination on humanitarian logistics support for urban disaster management in Kuala Lumpur. Frontiers in Sustainable Cities, Volume 5 – 2023, 2023. https://www.frontiersin.org/journals/sustainable-cities/articles/10.3389/frsc.2023.1149454 / doi: 10.3389/frsc.2023.1149454. ISSN=2624-9634

244 Hananto, Akhyari. Malaysia Has More Cars Than People. Yes, Seriously. Seasia. 16 May 2025. https://seasia.co/2025/05/16/malaysia-has-more-cars-than-people-yes-seriously

245 Asian Transport Outlook. Transport and Climate Profile: Malaysia. August 2024. https://asiantransportobservatory.org/documents/208/Malaysia-transport-and-climate-policy.pdf

246 Ministry of Transport. National Transport Policy 2019-2030. https://dpn.mot.gov.my/bukuDPNEn

247 Ministry of Transport. National Transport Policy 2019-2030. https://dpn.mot.gov.my/bukuDPNEn

248 Government of Malaysia – My Government. Public Service Delivery and Local Government - Digitalization of Road Damage Complaint Management Ministry of Works (MoW) Through MYJalan Mobile Application. Accessed 10 September 2025. https://www.malaysia.gov.my/portal/content/31335

249 Ismail, Azlina binti; and Intan Suhana binti Mohn Razelan. Highway and Traffic Engineering Road Classification and Design Standard in Malaysia. Universiti Malaysia Pahang. https://ocw.ump.edu.my/pluginfile.php/1342/mod_resource/content/1/chapter%201.pdf

250 Asian Transport Outlook. Transport and Climate Profile: Malaysia. August 2024. https://asiantransportobservatory.org/documents/208/Malaysia-transport-and-climate-policy.pdf

251 Ministry of Transport. National Transport Policy 2019-2030. https://dpn.mot.gov.my/bukuDPNEn

252 Railway Assets Corporation. Corporate Info. Accessed 10 September 2025. https://www.rac.gov.my/index.php/pages/view/1

253 Ministry of Transport. National Transport Policy 2019-2030. https://dpn.mot.gov.my/bukuDPNEn

254 Ministry of Transport. Current Rail Services. Accessed 21 August 2025. https://www.mot.gov.my/en/land/infrastructure/current-rail-services

255 Ministry of Transport. On-going Rail Projects. Accessed 25 August 2025. https://www.mot.gov.my/en/land/development/ongoing-rail-project

256 Ministry of Transport. Current Rail Services. Accessed 21 August 2025. https://www.mot.gov.my/en/land/infrastructure/current-rail-services

257 Shamsiah Omar; C.L. Wong; Jamil Shaari. Integrated River Basin Management (IRBN) in Malaysia). Journal of Water Resources Management, Vol 1 No 1 (2023) p 1-6. https://journal.water.gov.my; e-ISSN: 2811-3578

258 Sarawak Rivers Board. Functions of the Board. Accessed 10 September 2025. https://srb.sarawak.gov.my/web/subpage/webpage_view/43

259 Government of Sarawak. Transport and Infrastructure, Accessed 9 September 2025. https://www.sarawak.gov.my/web/home/article_apps_view/160/177/?swkid_auth

260 Sarawak Rivers Board. Functions of the Board. Accessed 10 September 2025. https://srb.sarawak.gov.my/web/subpage/webpage_view/43

261 Cindy Lai Fung Fung and Mohammed Ismail Russtam Suhrab. NAVIGATIONAL SAFETY OF INLAND WATERWAY TRANSPORT SYSTEM (IWTS) IN SARAWAK: RAJANG RIVER. Journal of Sustainability Science and Management Volume 18 Number 4, April 2023: 102-118. eISSN: 2672-7226. https://jssm.umt.edu.my/wp-content/uploads/sites/51/2023/09/8-JSSM-Volume-18-Number-4-April-2023-FINAL.pdf

262 UNDRR. Sendai Framework Monitor – Malaysia, G: Early Warnings. Accessed 4 November 2025. https://sendaimonitor.undrr.org/analytics/global-targets-all/21

263 UNDRR and World Meteorological Organization. Global Status of Multi-Hazard Early Warning Systems. 2024. https://www.undrr.org/publication/global-status-multi-hazard-earlywarning-systems-2024

264 ASEAN Secretariat. Strengthening ASEAN Multi-Hazard end to end Early Warning System for Natural Disasters: an assessment of current capacity https://asean.org/book/strengthening-asean-multi-hazard-end-to-end-early-warning-system-for-natural-disasters/

265 MET Malaysia. Organization Chart. Accessed 4 November 2025. https://www.met.gov.my/en/profil-korporat/carta-organisasi/

266 The Star. MetMalaysia upgrading tsunami warning system for faster alerts. 23 October 2025. https://www.thestar.com.my/news/nation/2025/10/23/metmalaysia-upgrading-tsunami-warning-system-for-faster-alert-issuance-says-johari

267 MET Malaysia. Services. Accessed 4 November 2025. https://www.met.gov.my/en/profil-korporat/perkhidmatan/

268 NADMA. NADMA Directive No. 1 (in Bahasa Malay). https://www.nadma.gov.my/images/2024/RujukanDalaman/Arahan_NADMA_No_1.pdf

269 ASEAN Secretariat. Strengthening ASEAN Multi-Hazard end to end Early Warning System for Natural Disasters: an assessment of current capacity https://asean.org/book/strengthening-asean-multi-hazard-end-to-end-early-warning-system-for-natural-disasters/; U.S. Embassy in Malaysia. Weather Alert. December 3, 2024. https://my.usembassy.gov/weather-alert-december-3-2024/

270 Meteorological Department of Malaysia Official Website. Ministry of Natural Resource and Nature Conservation. Accessed 1 October 2025. https://www.met.gov.my/

271 Malaysian Meteorological Department. myCuaca app. https://www.met.gov.my/en/info/mycuaca/

272 Department of Irrigation and Drainage Malaysia, Ministry of Energy Transition and Water Transformation. National Flood Forecasting and Warning Centre (PRABN). https://publicinfobanjir.water.gov.my/mengenai-kami/prabn/?lang=en

273 ASEAN Secretariat. Strengthening ASEAN Multi-Hazard end to end Early Warning System for Natural Disasters: an assessment of current capacity https://asean.org/book/strengthening-asean-multi-hazard-end-to-end-early-warning-system-for-natural-disasters/; U.S. Embassy in Malaysia. Weather Alert. December 3, 2024. https://my.usembassy.gov/weather-alert-december-3-2024/

274 Malaysia-Japan International Institute of Technology Kuala Lumpur. National Pilot Project for the Development of an Early Warning System and Monitoring of Geological Disaster Debris Flow and Landslides in Jerai Geopark Area, Kedah. https://mjiit.utm.my/dppc/ews-jerai-kedah/

275 ASEAN Secretariat. Strengthening ASEAN Multi-Hazard end to end Early Warning System for Natural Disasters: an assessment of current capacity https://asean.org/book/strengthening-asean-multi-hazard-end-to-end-early-warning-system-for-natural-disasters/; U.S. Embassy in Malaysia. Weather Alert. December 3, 2024. https://my.usembassy.gov/weather-alert-december-3-2024/

276 Shah, Mohd Farhaan. Malaysians may get disaster alerts direct to mobile phones soon, says Teo. The Star. 24 August 2025. https://www.thestar.com.my/news/nation/2025/08/24/malaysians-may-get-disaster-alerts-direct-to-mobile-phones-soon-says-teo#:~:text=KULAI:%20Malaysians%20may%20soon%20receive,to%20ensure%20funding%20and%20implementation.

277 Email communication from Amila Amunugama, Consultant, International Telecommunications Union, on 5 November 2025.

278 Ismail, Irwan Shafrizan. Govt rolls out Prime system to boost disaster communication response. Scoop. 16 June 2025. https://www.scoop.my/news/260799/govt-rolls-out-prime-system-to-boost-disaster-communication-response/#:~:text=The%20Communications%20Ministry%20has%20launched,said%20at%20the%20launch%20event; Freemalaysiatoday. Govt enhances disaster communications network in Sabah. Instagram. https://www.instagram.com/p/DOTMqs1jLtV/

279 Government of Malaysia. Official Portal Department of Environment Ministry of Natural Resources and Environmental Sustainability. Accessed 10 October 2025. https://www.doe.gov.my/en/utama-english/

280 Government of Malaysia. Cyber Security and Disaster Response and Recovery - Malaysia Emergency Response Services (MERS) 999. Accessed 5 November 2025. https://www.malaysia.gov.my/portal/content/30602

281 Malaysian Government My Government. Disaster Reports Delivering Through Disaster Informaiton Management System (MyDIMS). Accessed 3 October 2025. https://www.malaysia.gov.my/portal/content/31327; NDCC. MyDIMS National Disaster Management System, PowerPoint presentation. https://sentinel-asia.org/meetings/SA3JPTM6/agenda/Day1/Session3/3.1-3_Malaysia_NDCC-MyDIMS.pdf

282 Asian Network on Climate Science and Technology (ANCST). The Kuala Lumpur Multi-Hazard Platform for Disaster Resilient Cities. http://ancst.org/the-multi-hazard-platform-for-disaster-resilient-cities/

283 Zulkaple, Munirah. A Disaster Unforeseen: Reflections on Malaysia's Tsunami Response/ The ASEAN. https://theaseanmagazine.asean.org/article/a-disaster-unforeseen-reflections-on-malaysias-tsunami-response/

284 Malaysian Meteorological Department, Ministry of Natural Resources and Environmental Sustainability. Tsunami. https://www.met.gov.my/en/pendidikan/tsunami/#-Facts%20on%20Tsunami

285 The Star. MetMalaysia upgrading tsunami warning system for faster alerts. 23 October 2025. https://www.thestar.com.my/news/nation/2025/10/23/metmalaysia-upgrading-tsunami-warning-system-for-faster-alert-issuance-says-johari

286 MET Malaysia. Education – Tsunami. https://www.met.gov.my/en/pendidikan/tsunami/

287 Dermawan, Audrey. Malaysia's tsunami sirens get major upgrade to protect coastal communities. New Straits Times. https://www.nst.com.my/news/nation/2025/04/1206627/malaysias-tsunami-sirens-get-major-upgrade-protect-coastal-communities

288 Zulkaple, Munirah. A Disaster Unforeseen: Reflections on Malaysia's Tsunami Response/ The ASEAN. https://theaseanmagazine.asean.org/article/a-disaster-unforeseen-reflections-on-malaysias-tsunami-response/

289 UNESCO Tsunami Programme. Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS). https://tsunami.ioc.unesco.org/en/iotwms

290 Managing the Flow: Project Management Approaches to Unravelling Challenges in Malaysia's Flood Forecast and Warning Programme. https://rsisinternational.org/journals/ijriss/Digital-Library/volume-8-issue-9/1745-1751.pdf; The Official Web of Public Infobanjir, Department of Irrigation and Drainage Malaysia, Ministry of Energy Transition and Water Transformation. National Flood Forecasting and Warning Program (PRAB). Accessed 1 October 2025. https://publicinfobanjir.water.gov.my/mengenai-kami/prab/?lang=en

291 Managing the Flow: Project Management Approaches to Unravelling Challenges in Malaysia's Flood Forecast and Warning Programme. https://rsisinternational.org/journals/ijriss/Digital-Library/volume-8-issue-9/1745-1751.pdf; The Official Web of Public Infobanjir, Department of Irrigation and Drainage Malaysia, Ministry of Energy Transition and Water Transformation. National Flood Forecasting and Warning Program (PRAB). Accessed 1 October 2025. https://publicinfobanjir.water.gov.my/mengenai-kami/prab/?lang=en

292 Telegrafia. Success story – Kuala Lumpur Area Flood Forecasting and Early Warning System. 30 April 2024. https://www.electronic-sirens.com/success-story-kuala-lumpur-area-flood-forecasting-and-early-warning-system/

293 Telegrafia. Flood Early Warning System in Malysia. 19 August 2021. https://www.electronic-sirens.com/flood-early-warning-system-in-malaysia/

294 Zainal Azman Bin Abu Seman. National Disaster Management Agency. Disaster Management in Malysia PowerPoint. https://www.adrc.asia/acdr/2017/documents/7%20Malaysia%20National%20Disaster%20Management%20

Agency%20(NADMA)%20and%20its%20philosophy,%20Mr.%20Zainal%20Azman%20Bin%20Abu%20Seman,%20Deputy%20Director%20General,%20NADMA.pdf

295 The Official Web of Public Infobanjir, Department of Irrigation and Drainage Malaysia, Ministry of Energy Transition and Water Transformation. National Flood Forecasting and Warning Program (PRAB). Public Infobanjir. Accessed 2 October 2025. https://publicinfobanjir.water.gov.my/mengenai-kami/public-infobanjir/?lang=en; MalayMail. Irrigation Dept defends Selangor early warning system, pledges stronger flood alerts. 20 September 2025. https://www.malaymail.com/news/malaysia/2025/09/20/irrigation-dept-defends-selangor-early-warning-system-pledges-stronger-flood-alerts/191761

296 The Official Web of Public Infobanjir, Department of Irrigation and Drainage Malaysia, Ministry of Energy Transition and Water Transformation. National Flood Forecasting and Warning Program (PRAB). Flood Alert Registration. Accessed on 2 October 2025. https://publicinfobanjir.water.gov.my/perkhidmatan/daftar-amaran-banjir/?lang=en

297 BMKG. SAOFFG. https://ffgs.bmkg.go.id/alert/

298 Malaysia-Japan International Institute of Technology Kuala Lumpur. National Pilot Project for the Development of an Early Warning System and Monitoring of Geological Disaster Debris Flow and Landslides in Jerai Geopark Area, Kedah. https://mjiit.utm.my/dppc/ews-jerai-kedah/

299 Enhancing Landslide Early Warning Systems in Malaysia with LoRaWAN Wireless Monitoring Technology, https://www.senceive.com/blog/enhancing-landslide-early-warning-systems-malaysia-lorawan-wireless-monitoring-technology

300 Hong, Lynda. Malaysia establishes monitoring and warning system to predict level of fire risk for South-east Asia. Straits Times. 21 November 2024. https://www.straitstimes.com/singapore/environment/msia-establishes-monitoring-and-warning-system-to-predict-level-of-fire-risk-for-south-east-asia

301 World Meteorological Organization. Global Telecommunications System (GTS). Accessed 4 November 2025. https://community.wmo.int/en/activity-areas/global-telecommunication-system-gts

302 Hong, Lynda. Malaysia establishes monitoring and warning system to predict level of fire risk for South-east Asia. Straits Times. 21 November 2024. https://www.straitstimes.com/singapore/environment/msia-establishes-monitoring-and-warning-system-to-predict-level-of-fire-risk-for-south-east-asia

303 Malaysian Space Agency. Welcome to Forest Fire Information System (ForFIS). Accessed 6 October 2025. https://forfis.mysa.gov.my/; Malaysia Space Agency. Statement by Malaysia Delivered by Malaysian Space Agency (MYSA). https://www.unoosa.org/documents/pdf/copuos/stsc/2025/Statements/6_Malaysia.pdf

304 CIA World Factbook. Malaysia - Communications. Accessed 9 September 2025. https://www.cia.gov/the-world-factbook/countries/malaysia/#transportation

305 ITU. DataHub – Malaysia. 2024. https://datahub.itu.int/data/?e=MYS

306 Yahoo!finance Research and Markets. Malaysia Telecoms Industry Report 2024-2031: 4G Speeds Improved with Over 50% of 4G Sites now Equipped with Fibre Backhaul as well as 4G Coverage Reaching Over 97% of the Population. 12 June 2024. https://finance.yahoo.com/news/malaysia-telecoms-industry-report-2024-121000902.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d-3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAALLIcXD-5m0LrqTc1SSIwkTzqmQIv6NbU340sDmppiDgDCnD6z6D-DAYp61L45_sNAMI4mK15FEKm_mIKvfhyofYw8QRZxW2X-VQrABssldVBZQbnpVZ1YUUOXDhwr-j6iLPfm6peLBnONo-Obj82pt79LBx7HzKiDsXqmh_-5Fz407T

307 Yahoo!finance Research and Markets. Malaysia Telecoms Industry Report 2024-2031: 4G Speeds Improved with Over 50% of 4G Sites now Equipped with Fibre Backhaul as well as 4G Coverage Reaching Over 97% of the Population. 12 June 2024. https://finance.yahoo.com/news/malaysia-telecoms-industry-report-2024-121000902.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d-3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAALLIcXD-5m0LrqTc1SSIwkTzqmQIv6NbU340sDmppiDgDCnD6z6D-DAYp61L45_sNAMI4mK15FEKm_mIKvfhyofYw8QRZxW2X-VQrABssldVBZQbnpVZ1YUUOXDhwr-j6iLPfm6peLBnONo-Obj82pt79LBx7HzKiDsXqmh_-5Fz407T

308 ITU. DataHub – Malaysia. 2024. https://datahub.itu.int/data/?e=MYS

309 Yahoo!finance Research and Markets. Malaysia Telecoms Industry Report 2024-2031: 4G Speeds Improved with Over 50% of 4G Sites now Equipped with Fibre Backhaul as well as 4G Coverage Reaching Over 97% of the Population. 12 June 2024. https://finance.yahoo.com/news/malaysia-telecoms-industry-report-2024-121000902.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d-3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAALLIcXD-5m0LrqTc1SSIwkTzqmQIv6NbU340sDmppiDgDCnD6z6D-DAYp61L45_sNAMI4mK15FEKm_mIKvfhyofYw8QRZxW2X-VQrABssldVBZQbnpVZ1YUUOXDhwr-j6iLPfm6peLBnONo-Obj82pt79LBx7HzKiDsXqmh_-5Fz407T

310 Malaysian Communications and Multimedia Commission. Broadband. Accessed 6 October 2025. https://mcmc.gov.my/en/sectors/broadband

311 CIA World Factbook. Malaysia - Communications. Accessed 9 September 2025. https://www.cia.gov/the-world-factbook/countries/malaysia/#transportation; BBC. Malysia Media guide. 19 May 2023. https://www.bbc.com/news/world-asia-pacific-15384221

312 Siddharta, Amanda. Social media in Malaysia - statistics & facts. Statista. 4 July 2025. https://www.statista.com/topics/10858/social-media-in-malaysia/?srsltid=AfmBOorHqwpdMC_P2IIyRCQ-eWA-5tmGD3cO3GmJGUicj--Zg-Gbuld0#topicOverview

313 PETRA. Objectives, Mission and Vision. Accessed 26 August 2025. https://www.petra.gov.my/v2/article?id=objektif-visi-misi

314 World Bank Group. Data – Access to electricity (% of population) – Malaysia. 2022. https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=MY

315 AENERT – Advanced Energy Technologies. Energy industry in Malaysia. 5 April 2025. https://aenert.com/countries/asia/energy-industry-in-malaysia/

316 U.S. Energy Information Agency. Malaysia Analysis. Department of Energy. 12 November 2024. https://www.eia.gov/international/analysis/country/MYS

317 AENERT – Advanced Energy Technologies. Energy industry in Malaysia. 5 April 2025. https://aenert.com/countries/asia/energy-industry-in-malaysia/

318 International Trade Administration. Malaysia Power Sector and Grid Modernization. Department of Commerce. 7 November 2024. https://www.trade.gov/market-intelligence/malaysia-power-sector-and-grid-modernization

319 MIDA. Utilities. April 2021. https://www.mida.gov.my/wp-content/uploads/2021/04/CODB-ENGLISH-Utilities.pdf

320 Kuching Borneo. Kota Kinabalu based SESB now known as Sabah Electricity. 26 October 2024. https://kuchingborneo.info/kota-kinabalu-based-sesb-now-known-as-sabah-electricity/

321 Azia, Adam; and Cheryl Poo. Sabah's high-stakes electricity overhaul. The Edge Malaysia. 19 March 2025. https://theedgemalaysia.com/node/747517

322 Sarawak Energy. Our Organisation. Accessed 27 August 2025. https://www.sarawakenergy.com/about-us/our-organisation

323 World Energy Council. Sarawak Energy is World Energy Council's first Southeast Asian Global Patron; New partnership to advance shared vision of a decarbonised future energy system28 March 2024. https://www.worldenergy.org/news-views/entry/press-release-sarawak-energy-is-world-energy-councils-first-southeast-asian-global-patron

324 Borneo Post Online. Electricity demand in Sarawak expected to increase 33 pct by 2028, says Julaihi. 23 May 2023. https://mut.sarawak.gov.my/web/subpage/news_view/596

325 Thein, David. Sarawak to supply Sabah in October: Part of the Borneo Grid plan. Daily Express. 16 July 2025. https://www.dailyexpress.com.my/news/262595/sarawak-to-supply-sabah-next-month-part-of-the-borneo-grid-plan/

326 U.S. Energy Information Agency. Malaysia Analysis. Department of Energy. 12 November 2024. https://www.eia.gov/international/analysis/country/MYS

327 Economic Planning Unit. Water Sector Transformation 2040: Volume I. 2022. https://wst2040.my/

328 UN Department of Economic and Social Affairs. Malaysia – Progress on achieving SDG 6. Accessed 17 October 2025. https://sdgs.un.org/basic-page/malaysia-34130

329 Rahman, H. A. Water Issues in Malaysia. International Journal of Academic Research in Business and Social Sciences, 11(8), 860-875. 2021. DOI:10.6007/IJARBSS/v11-i8/10783

330 Department of Statistics Malaysia. Access to Treated Water by State and Strata. 2022. https://open.dosm.gov.my/data-catalogue/water_access

331 UN Water. Malaysia – SDG 6. 2022. https://www.sdg6data.org/en/country-or-area/Malaysia

332 Teoh, Felyx. Petra to drive National Water Policy for sustainable supply — Fadillah. Bernama via The Edge Malaysia. 13 August 2025. https://theedgemalaysia.com/node/766431

333 MIDA. Utilities. April 2021. https://www.mida.gov.my/wp-content/uploads/2021/04/CODB-ENGLISH-Utilities.pdf

334 Academy of Sciences Malaysia. Transforming the Water Sector: National Integrated Water Resources Management Plan (Volume I). 2016. https://oicwater.sesric.org/img/NATIONAL-INTEGRATED-WATER-RESOURCES-MANAGEMENT-PLAN-OF-MALAYSIA.pdf

335 Institute of Engineers, Malaysia. SPAN. Accessed 26 August 2025. https://www.myiem.org.my/content/span-589.aspx

336 Yeoh, Joanne. Clean Water for Rural Communities in Peninsular Malaysia. Soroptimist International 18 February 2021. https://www.soroptimistinternational.org/2021/02/18/clean-water-for-rural-communities-in-peninsular-malaysia/

337 Indah Water. Sewage Treatment Systems. Accessed 25 August 2025. https://www.iwk.com.my/objective-and-systems

338 Indah Water. IST and Connected. Accessed 25 August 2025. https://www.iwk.com.my/ist-and-connected

339 Water Environment Partnership in Asia. State of Water Environment - Malaysia. February 2023. https://wepa-db.net/wp-content/uploads/2023/02/1_State-of-water-environment_Malaysia.pdf

340 Indah Water. Sewage Treatment Systems. Accessed 25 August 2025. https://www.iwk.com.my/objective-and-systems

341 Sustainable Development Report. SDG Dashboards and Trends. SDG 3 Good health and well-being. Malaysia. https://dashboards.sdgindex.org/profiles/papua-new-guinea

342 Universal Health Coverage: Malaysia's Progress. 22nd ASEAN and Japan High-Level Officials Meeting on Caring Society. 25-27 November 2024. https://www.mhlw.go.jp/content/10500000/001463117.pdf

343 Universal Health Coverage: Malaysia's Progress. 22nd ASEAN and Japan High-Level Officials Meeting on Caring Society. 25-27 November 2024. https://www.mhlw.go.jp/content/10500000/001463117.pdf

344 The Institute for Health Metrics and Evaluation. Malaysia. What causes the most death and disability combined? 2021. https://www.healthdata.org/research-analysis/health-by-location/profiles/malaysia

345 Universal Health Coverage: Malaysia's Progress. 22nd ASEAN and Japan High-Level Officials Meeting on Caring Society. 25-27 November 2024. https://www.mhlw.go.jp/content/10500000/001463117.pdf

346 Mohd Noh, S. N., Jawahir, S., Tan, Y. R., Ab Rahim, I., & Tan, E. H. (2022). The Health-Seeking Behavior among Malaysian Adults in Urban and Rural Areas Who Reported Sickness: Findings from the National Health and Morbidity Survey (NHMS) 2019. International journal of environmental research and public health, 19(6), 3193. https://doi.org/10.3390/ijerph19063193

347 Universal Health Coverage: Malaysia's Progress. 22nd ASEAN and Japan High-Level Officials Meeting on Caring Society. 25-27 November 2024. https://www.mhlw.go.jp/content/10500000/001463117.pdf

348 Universal Health Coverage: Malaysia's Progress. 22nd ASEAN and Japan High-Level Officials Meeting on Caring Society. 25-27 November 2024. https://www.mhlw.go.jp/content/10500000/001463117.pdf

349 Iskandar I, Radhi N. New Strait Times. Malaysia targets 1:400 doctor ratio, addresses retention. 25 February 2025. https://www.nst.com.my/news/nation/2025/02/1180508/malaysia-targets-1400-doctor-ratio-addresses-retention

350 Dzulkefly Ahmad, YB Datuk Seri Dr and Abeyasinghe, Rabindra Dr. World Health Organization. 7Malaysia's commitment to the right to health. 7 April 2024. https://www.who.int/malaysia/news/detail/07-04-2024-malaysia-s-commitment-to-the-right-to-health

351 World Health Organization Western Pacific Region and Government of Malaysia. Ministry of Health. Malaysia-WHO

Country Cooperation Strategy. 2024-2028. https://iris.who.int/server/api/core/bitstreams/ceabb944-390c-4021-a7c0-0f8794f684ea/content

352 Zalani A. Yahoo! News. MoH issues five new guidelines to keep Malaysia ready to act on disasters. 15 October 2024. https://malaysia.news.yahoo.com/moh-issues-five-guidelines-keep-044332910.html

353 Government of Malaysia. Ministry of Health. Malaysia Strategy for Emerging Diseases and Public Health Emergencies (MySED) II Workplan. 2017-2021. https://www.moh.gov.my/moh/resources/Penerbitan/Garis%20Panduan/Pengurusan%20KEsihatan%20&%20kawalan%20pykit/MySED_II.pdf#:~:text=In%20line%20with%20the%20APSED%20III%2C%20Joint,its%20public%20health%20response%20and%20preparedness%20strategies; World Health Organization. Malaysia: Strong Preparedness and Leadership for a successful COVID-19 Response. August 2020. https://www.who.int/docs/default-source/coronaviruse/country-case-studies/malaysia-c19-case-study-20-august.pdf?sfvrsn=a0f79358_2#:~:text=Assessing%20health%20system%20capacity,for%20Western%20Pacific%20(WPRO).

354 Samad B, Means B, Velez I, Banaski J, Standley C. Public Health EOC Guidance. Malaysia Emergency Operations Center (EOC) Case Study. 26 October 2020. https://www.epidemic-em.org/case-studies/malaysia/

355 World Health Organization. EMT Global Classified Teams. Accessed 25 September 2025. https://www.who.int/emergencies/partners/emergency-medical-teams/emt-global-classified-teams

356 Mercy Malaysia. About Mercy Malaysia. Accessed 25 September 2025. https://mercy.org.my/who-we-are/

357 TEPHINET. The Task Force for Global Health. Malaysia Epidemic Intelligence Program. Accessed 26 September 2025. https://www.tephinet.org/training-programs/malaysia-epidemic-intelligence-program

358 Asian Disaster Reduction Centre. Country Report. Malaysia. Visiting Researcher Program FY2024. https://www.adrc.asia/countryreport/MYS/2024/Malaysia_CountryReport_FY2024.pdf

359 Malaymail. Nanta stresses need to improve fire preparedness in longhouse communities after Song blaze. 12 October 2025. https://www.malaymail.com/news/malaysia/2025/10/12/nanta-stresses-need-to-improve-fire-preparedness-in-longhouse-communities-after-song-blaze/194363

360 MyCARE. Humanitarian Care Malaysia. Accessed 25 September 2025. https://www.mycare.org.my/introduction/

361 MERCY Malaysia. Shelter Projects. What do we do? Accessed 26 September 2025. https://mercy.org.my/wp-content/uploads/2025/01/Shelter-Projects-1.pdf

362 Government of Malaysia. National Security Council. Directive No.20. Policy and Mechanism of National Disaster Management and Relief. https://www.rcrc-resilience-southeastasia.org/wp-content/uploads/2017/12/1997_policy_and_mechanism_of_national_disaster_management_and_relief_national_security_council_directive.pdf

363 UNHCR Malaysia. Shelter. Accessed 30 September 2025. https://www.unhcr.org/my/what-we-do/respond-emergencies/shelter

364 Delmendo, Lalaine C. Global Property Guide. Malaysia's Residential Property Market Analysis 2025. 2 May 2025. https://www.globalpropertyguide.com/asia/malaysia/price-history#_Historic_Perspective

365 Government of Malaysia. PWC. 13th Malaysia Plan. August 2025. https://www.pwc.com/my/en/publications/2025/13th-malaysia-plan.html

366 Kearney. Transforming Malaysia into a more food-secure nation. Accessed 30 September 2025. https://www.kearney.com/documents/291362523/293500342/Transforming+Malaysia+into+a+more+food-secure+nation.pdf/7e6d440a-879f-2beb-ef0c-42887d7bf515?t=1684783368000

367 Government of Malaysia. Ministry of Agriculture and Food Industries. National Pathway for Food Systems Transformation. United Nations – Food Systems Pre-Summit. 26 July 2021. https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/national-pathways/malaysia/2021-09-09-en-malaysia-national-pathway.pdf?sfvrsn=118c3fcf_1

368 Government of Malaysia, Ministry of Agriculture and Food Industries. National Agrofood Policy 2021-2030 (NAP2.0), p1. 24 October 2021. https://faolex.fao.org/docs/pdf/mal211654.pdf

369 U.S. Department of Commerce, International Trade Administration. "Malaysia—Agricultural Sector (Country Guide) Updated 2024. https://www.trade.gov/country-commercial-guides/malaysia-agricultural-sector

370 U.S. Department of Commerce, International Trade Administration. "Malaysia—Agricultural Sector (Country Guide) Updated 2024. https://www.trade.gov/country-commercial-guides/malaysia-agricultural-sector

371 Rohan Abu Dardak, Food Security Dilemma in Malaysia. Food and Fertilizer Technology Center for the Asian and Pacific Region.14 April 2025. https://ap.fftc.org.tw/article/3745

372 National Coordinating Committee on Food and Nutrition, Ministry of Health Malaysia. Malaysian Dietary Guidelines 2020. https://hq.moh.gov.my/nutrition/wp-content/uploads/2024/03/latest-01.Buku-MDG-2020_12Mac2024.pdf, p4

373 Malaysia Technology Development Corporation. Malaysia's Food Security Challenge: The Food Import Dependency. 20 June 2025. https://www.mtdc.com.my/malaysias-food-security-challenge-the-food-import-dependency/

374 Reuters. Malaysia requests India ease export curbs on some farm goods. 18 July 2024. https://www.reuters.com/world/asia-pacific/malaysia-requests-india-ease-export-curbs-some-farm-goods-2024-07-18/

375 Sutanuka Ghosal. India allows export of 200,000 tonne non-basmati rice to Malaysia. The Economic Times. 21 August 2024. https://economictimes.indiatimes.com/news/economy/foreign-trade/india-allows-export-of-200000-tonne-non-basmati-rice-to-malaysia/articleshow/112679079.cms

376 Reuters. Malaysia's ban on chicken exports expected to end on Aug. 31. 3 August 2022. https://www.reuters.com/markets/commodities/malaysias-ban-chicken-exports-expected-end-aug-31-minister-2022-08-04/

377 Ministry of Agriculture and Food Industries Malaysia. National Pathway for Food Systems Transformation. United Nations – Food Systems Pre-Summit. 26-28 July 2021. https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/national-pathways/malaysia/2021-09-09-en-malaysia-national-pathway.pdf?sfvrsn=118c3fcf_1

378 Ministry of Agriculture and Food Industries Malaysia. National Pathway for Food Systems Transformation. United Nations – Food Systems Pre-Summit. 26-28 July 2021. https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/national-pathways/malaysia/2021-09-09-en-malaysia-national-pathway.pdf?sfvrsn=118c3fcf_1

379 ASEAN Coordination Centre for Humanitarian Assistance. Flash Update No. 03: Effects of Northeast Monsoon in Peninsular Malaysia and Southern Thailand. 21 December 2022. https://ahacentre.org/flash-update/flash-update-no-03-effects-of-northeast-monsoon-in-peninsular-malaysia-and-southern-thailand-21-december-2022/

380 Government of Malaysia. Food Security Policy Action Plan (2021–2025); MTDC, 2024.

381 Ministry of Agriculture and Food Industries Malaysia. National Pathway for Food Systems Transformation. United Nations – Food Systems Pre-Summit. 26-28 July 2021. https://www.unfoodsystemshub.org/docs/unfoodsystemslibraries/national-pathways/malaysia/2021-09-09-en-malaysia-national-pathway.pdf?sfvrsn=118c3fcf_1

382 National Disaster Management Agency, Prime Minister's Department. Ensuring Malaysia's Disaster Preparedness. 22 February 2022. https://www.nadma.gov.my/bi/media-en/news/302-ensuring-malaysia-s-disaster-preparedness.

383 National Disaster Management Agency. 650 tonnes of aid worth RM35mil distributed to flood victims. 21 February 2025. https://www.nadma.gov.my/bi/media-en/news/2837-650-tonnes-of-aid-worth-rm35mil-distributed-to-flood-victims-nadma

384 Nestle Malaysia. Nestle Malaysia and MRC Join Forces to Aid Flood Victims: 5,000 Boxes of Food Essentials Packed by Dedicated Volunteers. 29 November 2024. https://www.nestle.com.my/media/pressreleases/nestlecaresxmrc-2024

385 Bernama. "KFC Malaysia pledges RM100,000 and delivers meals to help flood evacuees through Add Hope Initiative. 16 December 2024. https://www.bernama.com/en/news.php?id=2374285

386 Bernas. National Stockpile Management. https://bernas.com.my/commitment/midstream/national-stockpile-management (Accessed 8 October 2025)

387 Bernas. About Us. https://bernas.com.my/about-us/overview (Accessed 10 October 2025)

388 From tragedy to triumph: How SMART became a global search and rescue force, The Star, 29 March 2025. https://www.thestar.com.my/news/nation/2025/03/29/from-tragedy-to-triumph-how-smart-became-a-global-search-and-rescue-force#goog_rewarded

389 Fitzgibbon, C. and Crosskey, A. Disaster risk reduction management in the drylands in the Horn of Africa. Brief prepared by a Technical Consortium hosted by CGIAR in partnership with the FAO Investment Centre. Technical Consortium Brief 4. Nairobi: International Livestock Research Institute. 2013. https://repo.mel.cgiar.org/handle/20.500.11766/5197

390 UNDRR. Terminology. Accessed 8 September 2022. https://www.undrr.org/terminology

391 European Commission. Disaster Risk Management Knowledge Centre (DRMKC). INFORM. Accessed 30 January 2023. https://drmkc.jrc.ec.europa.eu/inform-index

392 European Commission. Disaster Risk Management Knowledge Centre (DRMKC). INFORM Global Risk Index. Methodology. https://drmkc.jrc.ec.europa.eu/inform-index/InDepth/Methodology

393 European Commission. Disaster Risk Management Knowledge Centre (DRMKC). INFORM Risk Methodology. https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Methodology

394 European Commission. Disaster Risk Management Knowledge Centre (DRMKC). INFORM Country Risk Profile 2025 – Malaysia. https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk/Country-Risk-Profile

395 Hunter, Murray. Malaysia Formalizes the US Defense Relationship - Analysis. 10 November 2025. Eurasia Review. https://www.eurasiareview.com/10112025-malaysia-formalizes-the-us-defense-relationship-analysis

396 Washington National Guard. State Partnership Program. Accessed 12 August 2025. https://mil.wa.gov/state-partnership-program

397 Lamkin, Tommy. NAMRU INDO PACIFIC Grows Partnership in Malaysia. USINDOPACOM. 15 October 2024. https://www.pacom.mil/Media/NEWS/News-Article-View/Article/3936270/namru-indo-pacific-grows-partnership-in-malaysia/

398 IFRC. Emergency Plan of Action (EPoA): Malaysia: Flash Floods. 27 December 2021. https://reliefweb.int/report/malaysia/malaysia-flash-floods-emergency-plan-action-epoa-dref-operation-mdrmy008

399 U.S. Embassy Malaysia. U.S. Embassy Donates RM 420,000 to Aid Flood Victims. 30 December 2021. https://my.usembassy.gov/u-s-embassy-donates-rm-420000-to-aid-flood-victims/

400 USINDOPACOM. U.S. Embassy Kuala Lumpur Provides Additional COVID-19 Assistance to Malaysia. 21 June 2021. https://www.pacom.mil/Media/NEWS/Article/2664921/us-embassy-kuala-lumpur-provides-additional-covid-19-assistance-to-malaysia/

401 USINDOPACOM. U.S. Contributes 1 Million Pfizer Vaccine Doses to Malaysia's COVID-19 Response. 06 July 2021. https://www.pacom.mil/Media/NEWS/Article/2683557/us-contributes-1-million-pfizer-vaccine-doses-to-malaysias-covid-19-response/

402 USINDOPACOM. U.S. Embassy Announces Malaysian Ringgit 1 Million Donation. 30 December 2021. https://www.pacom.mil/Media/NEWS/News-Article-View/Article/2886180/us-embassy-announces-malaysian-ringgit-1-million-donation/

403 DeRobertis, 1st Lt. Samuel. U.S., Malaysian forces conclude Bersama Warrior 25. Marine Rotational Force – Darwin. 30 June 2025. https://www.pacom.mil/Media/NEWS/News-Article-View/Article/4231047/us-malaysian-forces-conclude-bersama-warrior-25/

404 CFE-DM. Monthly Newsletter – 1 July 2024. https://www.cfe-dmha.org/LinkClick.aspx?fileticket=5sltwpDiCVs%3d&portalid=0

405 Hunter, Murray. Malaysia Formalizes the US Defense Relationship - Analysis. 10 November 2025. Eurasia Review. https://www.eurasiareview.com/10112025-malaysia-formalizes-the-us-defense-relationship-analysis/

406 Hunter, Murray. Malaysia Formalizes the US Defense Relationship - Analysis. 10 November 2025. Eurasia Review. https://www.eurasiareview.com/10112025-malaysia-formal-

izes-the-us-defense-relationship-analysis/; Moore, Rebecca, Lt. j.g. U.S. Malaysian Armed Forces Deepen Cooperation through CARAT Malaysia 2024. U.S> Navy. https://www.navy.mil/Press-Office/News-Stories/Article/3957708/us-and-malaysian-armed-forces-deepen-cooperation-through-carat-malaysia-2024/

407 Erickson, Col. Elizabeth. and Chloe Arevalo. Collaboration at Indo-Pacific military health exchange enhances interoperability. USINDOPACOM. 10 October 2023. https://www.pacom.mil/Media/NEWS/Article/3553100/collaboration-at-indo-pacific-military-health-exchange-enhances-interoperability/

408 USINDOPACOM. Pacific Partnership 2023 Arrives in Malaysia. 6 September 2023. https://www.pacom.mil/Media/NEWS/News-Article-View/Article/3517403/pacific-partnership-2023-arrives-in-malaysia/

409 Woods, Capt. Lauren. Pacific Angel 22-2 Strengthens Ties with Indo-Pacific Allies and Partners. USINDOPACOM. 25 August 2022. https://www.pacom.mil/Media/NEWS/Article/3140030/pacific-angel-22-2-strengthens-ties-with-indo-pacific-allies-and-partners/



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