Required Environmental Assessment in Myanmar

Hla Baw
Environmental Committee

Fed.MES

Country Data

- Area 677,000 km^2
- Population 51.3 million
- Renewable surface water potential 1167.8 km^3
- Available water/ Head 19550 m^3/Head
- Groundwater potential 495 km^3
- Water Use Ratio, Agriculture 89%
  Domestic 10%
  Industrial 1%

Present water use 31.079 km^3 in 1980-1993 and 38.830 km^3 is estimated in 2005. (ie. 4% of potential, 5% in 2014)

Rainfall

Coastal area 5080 mm, Ayeyarwady Delta 2540 mm,

Central Myanmar 635 mm

Continued

- Forest cover in 2025 70.47 million acre (42.15%)
- Coastal length - 2800 km (1/5 of the Ecosystem of bay of Bangal)
- Mangrove forest - 1.26 million acre (0.76% of country area, Ranking 7th in the World and 3rd in Asia)
- Yakhine, Ayeyarwady Delta and Tanintherry coastal lines are vital area for Blue Economy.
- (8) no of Reserved Mangrove forest area in Ayeyarwady Region is 0.37 million acre.

Major Environmental Issues

(1) Forest depletion and Carbon Emission

(2) Water pollution and River system conservation

(3) Air pollution

(1)Forest Depletion and Carbon Emission

Depletion of forest cover, burning fossil fuel, mining/extraction and waste and excessive use of fertilizer to increase agricultural products are human-caused emission and also main causes of increasing carbon and Methane gas emission and forming GHG.

Location of Tree Cover loss in Myanmar between the year 2001 and 2025

State/Region	Tree cover loss
Shan	1.8 mha
Tanintharyi	580 kha
Kachin	570 kha
Saggaing	510 kha
Chin	500 Kha

The Rate of Deforestation in Myanmar between 2015 and 2020

Country	Deforestation Rate (kha/year)
Indonesia	650
United Republic of Tanzania	470
Myanmar	290
Paraguay	280
Mozambique	270

Source- FAO

Tree Cover loss due to Fires

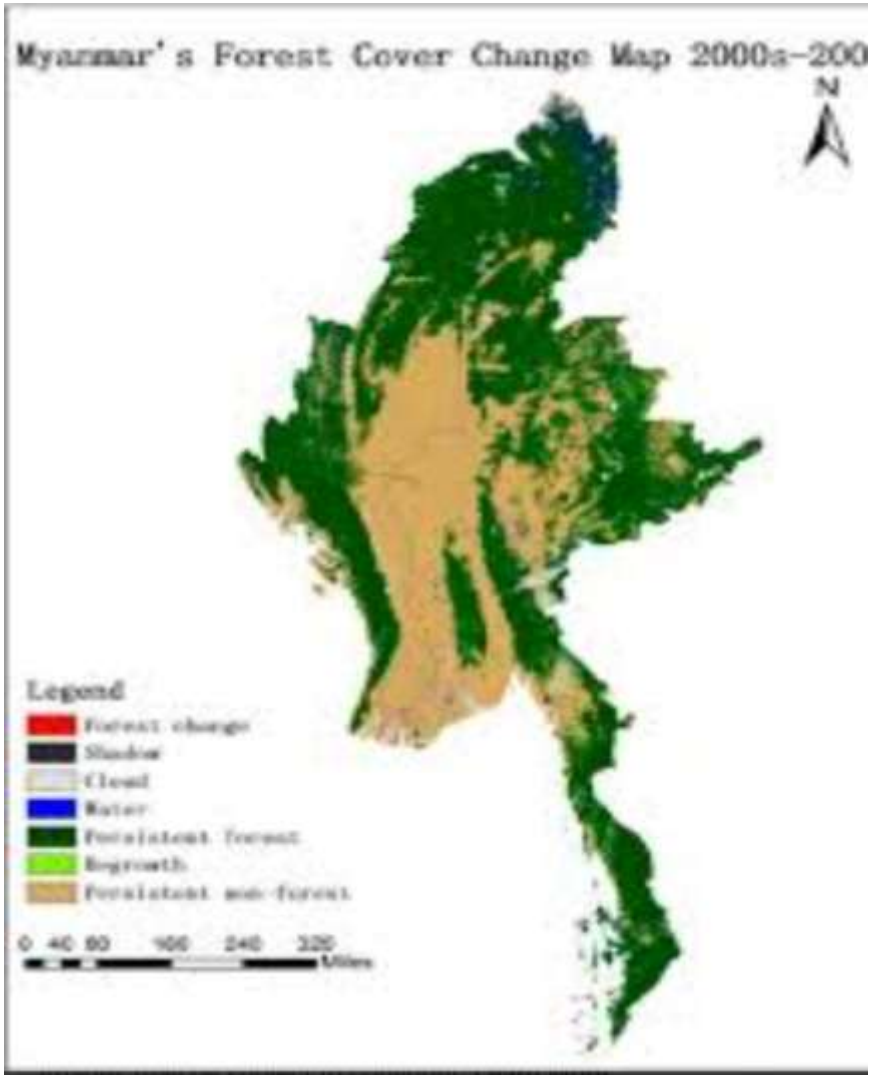
Tree cover loss due to fire in Myanmar 2001-2025 is 52 kha of forest area and 5.3 mha from all other drivers of loss. (1%)

The year with the most tree cover loss due to fires during this period was 2012 with 4.7 kha lost to fires- 2.0% of all tree cover loss for that year

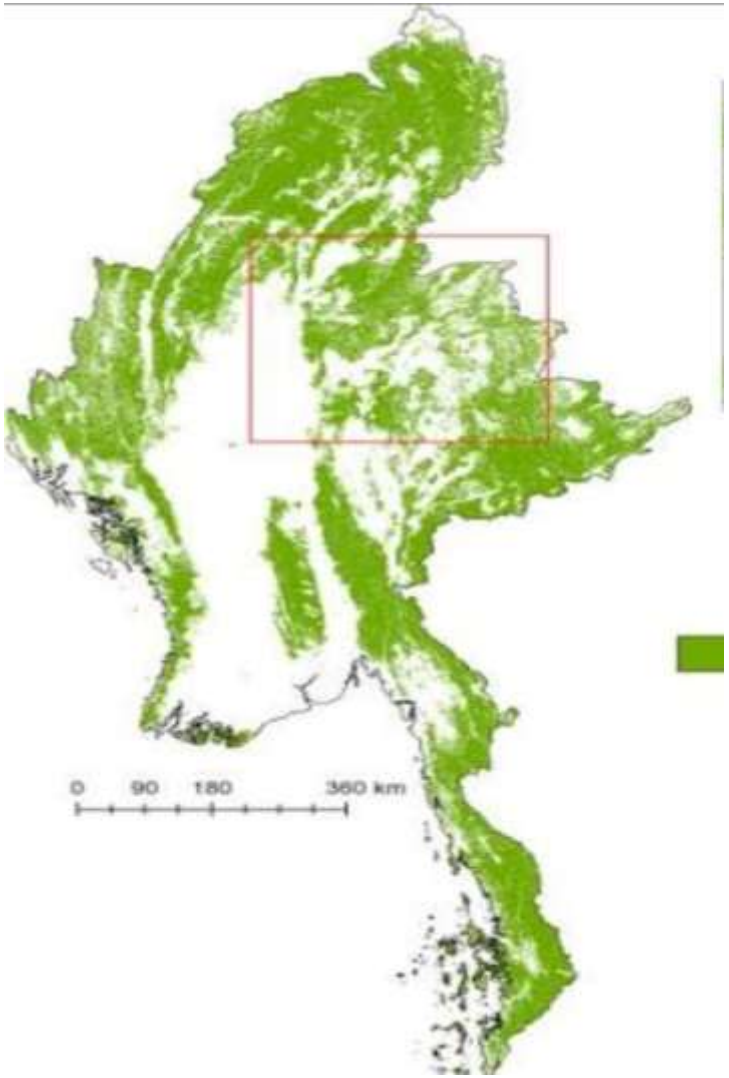
Source – Global Forest Watch (GFW)

Changes of Forest cover in Myanmar

Forest cover in 2000-2005



Predicted Forest cover in 2027



Continued

Effect of reducing forest cover

Previously forest cover in Myanmar is about 57.9% in 1990 and at present is only 42.15%. From 2001 to 2024, almost 12% of the year 2000 tree cover is lost and 3.1 Gt CO_2e emission.

Main causes of depletion of forest area are:

(1) Illegal cutting and extraction of timber,

(2) Forest fire due to human-cause,

(3) Lack of proper management,

(4) Traditional slash and burn cultivation method,

(5) Development works such as road, dams and reservoirs and encroachment of people.

Continued

Reducing of forest cover affects:

(1) Land and soil erosion,

(2) Sediment deposition in downstream area, reservoirs, river course etc.

(3) Reducing infiltrated water for restoration and increasing surface runoff rate,

(4) Consequence effect such as flash flood and changes of navigation waterway along the downstream river course,

(5) Consequence effect on climate change due to increasing carbon emission and reducing carbon credits also,

(6) Seriously affect on ecosystem of flora and fauna.

Forest Area Conservation

Forest area conservation requires:

(1) Reforestation and a-forestation according to regulation and lay-out plan.

(2) Prevent and require law enforcement of illegal cutting and extraction of timber.

(3) Enhance cooperation and coordination works among stakeholders.

(4) Consideration of development works in forest area such as highway, public area, industrial development and people encroachment to forest area.

Mangrove forest Conservation

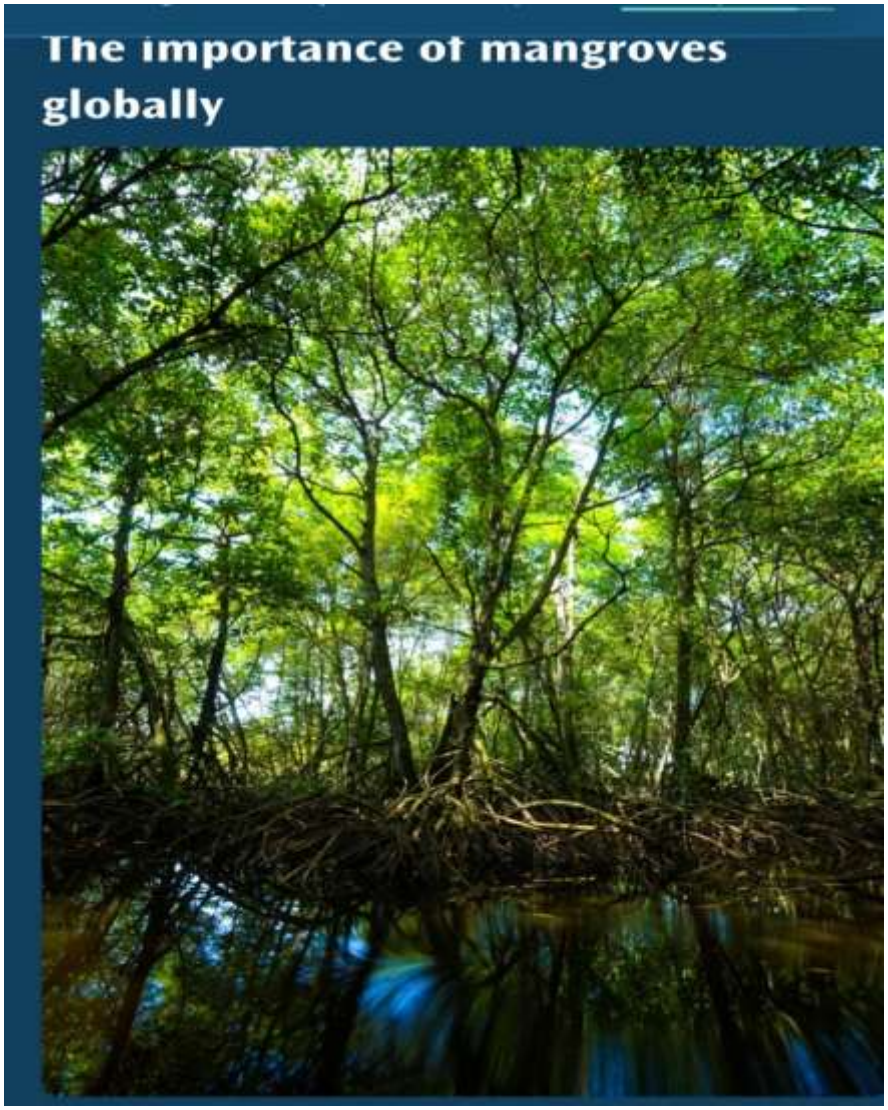
Mangrove grow in 123 countries around the world. Myanmar has the 7th largest mangrove area in the world and 3rd in Asia with a total area of 1.26 million acre.

The mangrove ecosystem in Myanmar consists of two types: mangroves in the river deltas and mangroves in the coastal regions of Yakhine State and Taninthari Region.

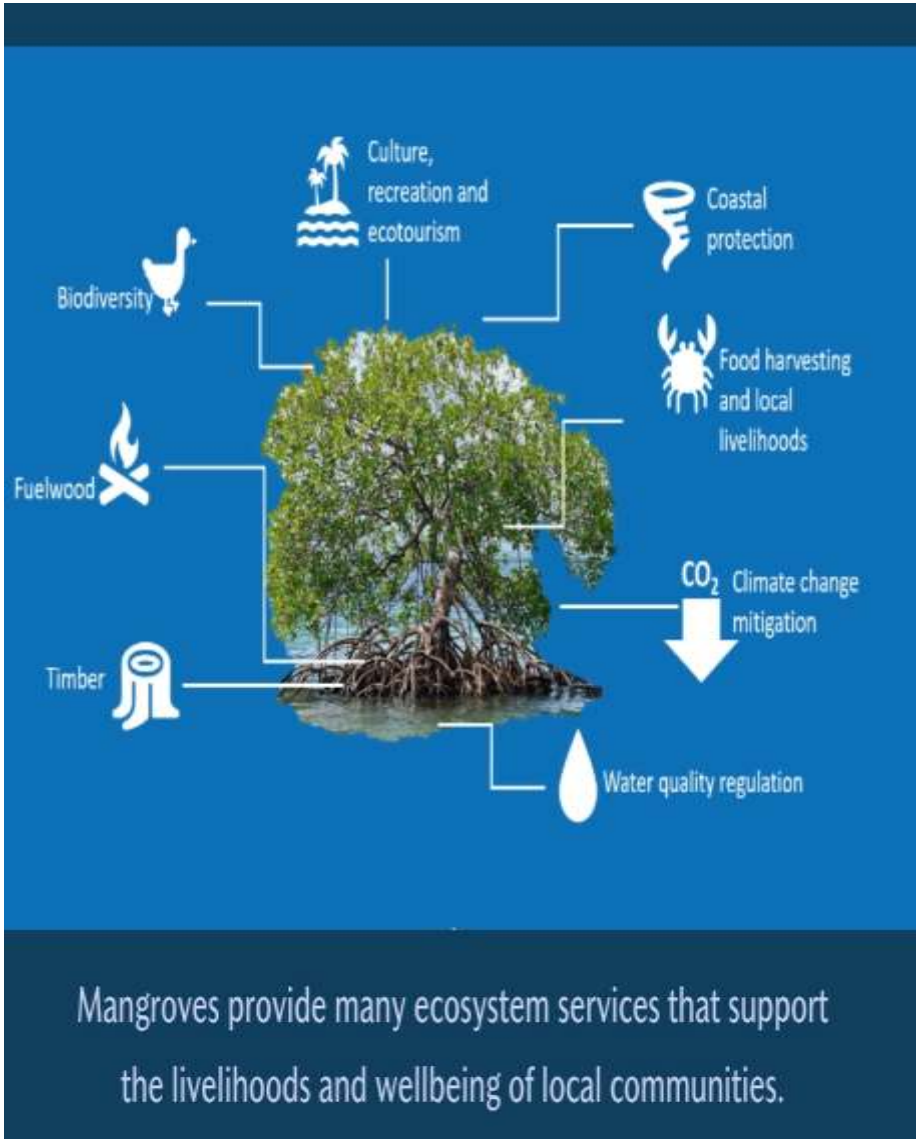
Mangrove forest in Taninthari Coastal Area

ခိုကျွန်းဒေရတောကြိုးပြင်ကာကွယ်တော၏ သဘာဝရှုခင်း။

Mangrove forest



Providing Ecosystem by Mangrove Forest



Services of Mangrove Ecosystem

(1) Provisioning Services

- Extraction of timber and non-timber forest products.
- Ability to create a natural habitat for fish and shrimp to spawn, survive, and grow.
- Provision of aquatic products and food supplies.
- Provision of herbal medicines.

(2) Supporting Services

- Preventing saltwater intrusion into drinking water sources.
- Enabling the survival and dependence of biodiversity.
- Preventing coastal erosion and landslides.
- Capability to store carbon.

Continued

(3) Regulatory Services

- providing protection from severe weather conditions, including cyclones and storms

- Regulating and maintaining a balanced and stable climate.
- Regulating to prevent flooding.
- Filtering out waste and impurities.

(4) Cultural Services

- Facilitating environmental education and research activities.
- Recreation and relaxation.
- Enabling nature-based tourism activities

Reasons for decline and degradation of mangrove forest

- Increasing population leading to greater demands.
- Expansion of village settlements.
- Over extraction of forest products especially firewood and charcoal.
- Expansion of agricultural land.
- Expansion of salt pan operations (solar salt farming)
- Expansion of unsustainable shrimp farming practices.
- Encroachment and expansion by business operators into mangrove areas.
- Expansion of urban areas.

Advantages of Mangrove Forest

(1) Breeding place for fishes, prawns and crab, that increase blue economy for coastal area.

(2) Reducing carbon emission and consequence effect of climate change.

(3) Increasing blue carbon and carbon credit.

(4) preventing storm surge (Tsunami) and intrusion of saline water and bank erosion.

(5) Conserve coastal area ecosystem.

(2)Water Pollution and River System Conservation

The Ayeyarwady River

is the longest and most important rivers in Myanmar. It flows entirely within the country and serves as the main waterway connecting northern and southern region. The river eventually spreads into a large delta before emptying into the sea.

The Chindwin River

is the largest tributary of the Ayeyarwady River. It flows through northwestern Myanmar and joins the Ayeyarwady near the city of Pakokku. The river originate in the mountains near the India-Myanmar border. It flows south through Sagaing Region before joining the Ayeyarwady River. The Chindwin River passes through remote regions rich in forest and natural resources, contains forests and wildlife habitats.

Continued

The Thanlwin River (Transbondary River)

known as international river and is one of the longest rivers in Southeast Asia. (China Nu River, Tibetan Naqu River). The Thanlwin River begins in the Tibetan plateau and flows through China, Myanmar and Thailand and also mountainous regions and deep valleys. Because of the rugged terrain, large parts of the river remain relatively untouched by development. The surrounding landscapes contain forests, wildlife habitats, and scenic mountain views.

The Sittaung River

flows through central and southern Myanmar. It plays an important role in regional agriculture and transportation. The river begins in Shan Plateau and flows through the Bago Region before entering The Gulf of Martaban. One interesting feature of the Sittaung River is its tidal bore. And Sittaung river delta (Gulf of Mottama) is one of the UNESCO Ramsar sites in Myanmar.

UNESCO Ramsar Sites in Myanmar as of 2026

There are Seven recognized Wetlands of Ramsar sites in Myanmar:

(1) Moeyungyi Wetland Wildlife Sanctuary.(Migratory waterbirds)

(2) Indawgyi Lake Wildlife Sanctuary. (UNESCO Biosphere Reserve)

(3) Inle Lake.(Floating agriculture, indigenous communities, and biodiversities)

(4) Gulf of Mottama (Gulf of Motabam). (Endangered Spoon-billed Sandpiper)

(5) Meinmahla Kyun Wildlife Sanctuary.(Mangrove ecosystem, Crocodiles) and Thamihla kyun (diamond island) for endangered Green turtles.

(6) Nanthar Island and Mayyu Estuary located in Rakhine. (Wintering waterbirds)

(7) Pyu Lake located in Tada-U. (Diving duck species likes the Baer's Pochard)

Causes of Pollution on River System

(1) Developing of industrial zone in urban area and along the river and near the water body such as lake and retention basin causes water pollution due to effluent water without required treatment. (no. of industrial zone in Myanmar as of Mid-2025 are 28 established, 5 industrial wards, and 2 on going projects)

(2) Sediment deposition, because of soil erosion in upland area.

(3) Lack of proper management in catchment area.

(4) Traditional slash and burn cultivation in upland area.

(5) Gold mining and other mining process without control.

(6) Lack of conservation of flood plain and reservation room for river.

Continued

(7) Lack of conservation of retention and detention basins along the river course for conserving existing ecosystem and flood water.

(8) Sandbars formation along navigation route for all weather transportation.

(9) Bank erosion along the river course due to illegal sand mining.

(10) Need to control development work and people encroachment in flood plain and retention basin area.

Silt deposition in Pan Hlaing River

One of Gold Mining in Myanmar

River Pollution in Myanmar

- Particularly has reached a critical stage in Shan and Kachin States due to unregulated, conflict-driven gold and rare earth mining, with toxic heavy metals likes arsenic, nickel, and manganese leaking into major tributaries of Mekong and Thanlwin Rivers.

- **Key Aspects of Myanmar Rivers Pollution (2025-2026)**

- **Mining Impact(Shan State)** : Gold and Rare Earth
- **Contaminated Rivers:** The Kok, Sai and Ruak rivers (Tributaries of Mekong) have shown dangerous level of arsenic.
- **Cross-Border crisis:** Thailand has reported severe water pollution in the Mekong and its tributaries, with diseased fish and unsafe drinking water.
- **Health and Environmental hazard:** Toxic byproducts like cyanide are contaminating water killing fish and threatening the health of over a million people in the river basin.

Continued

- **Plastic Pollution & Micro-plastics:** Ayeyarwady River is rank among the most polluted in the world due to high plastic waste increased micro-plastic concentrations are appearing in the bay of Bengal and surrounding aquaculture.
- **Industrial and Urban Wastewater:** Uncontrolled sewage and wastewater from growing urban areas, introduce significant fecal coliforms, E.coli and industrial plastics into waterways.
- **Climate Change and Siltation:** Changing weather patterns combined with deforestation are causing increased sedimentation, causing shallow rivers to flood, navigation and water quality.
- **Ecosystem Damage:** Chemical contamination from mining is poisoning fish, endangering biodiversity, and contributing to the decline of aquatic ecosystems, including the endangered Ayeyarwady dolphin.
- **Lack of Regulation:** Ongoing, conflict-affected areas prevent effective environmental enforcement allowing polluting.

Consideration for conservation works

(1) Need to monitor seasonal water quality according to the national standard.

(2) Coordination and cooperation with respective Departments and Ministries for conservation of river course.

(3) Plan for flood water management and water sharing and early warning system for hazardous case.

(4) For navigation purpose consider river bed regulation, water level regulation, and discharge regulation.

(5) Consider Environmental flow (Continuous flow) for ecosystem, Delta formation and downstream security for water use (Riparian right).

Note- Sedimentation rate of Ayeyarwady/Year in 1986 is 278 million ton and 326-364 million ton/year in 2025. Delta extension is approximately 50 m/year**. Source - Internet AGU publication**.

Water Quality Standards in Myanmar

- **2022-2023 potable drinking water quality standard** based on 2014 standards. (Largely based on WHO guidelines)
- Microbiological : E. coli or thermo-tolerant coliform bacteria should not be detectable in any 100 mL sample.("0" per 100mL)
- Physical/Chemical:

- **Turbidity:** < 5 NTU (nephelometric turbidity units)
- **pH :** 6.5 – 8.5 (ideal range)
- **Arsenic:** < 0.05mg/L (50 ppb)
- **Lead:** 0.01 mg/L
- **Mercury:** 0.001 mg/L
- **Iron:** < 1.0 mg/L
- **Free Chlorine:** Recommended 0.2 – 0.5 mg/L in piped water.
- **Chloride:** 250 mg/L

Continued

- **Nitrate (as NO_3):** 50 mg/L
- **Total Dissolved Solids:** 1000 mg/L

General Liquid Effluent Levels

- **BOD (5 day)** : 30 -50- mg/L
- **COD :** 125 – 250 mg/L
- **Total Suspended Solids (TSS):** 50 mg/L
- **Oil and Grease :** 10 mg/L
- **pH :** 6.0 – 9.0 S.U
- **Total Nitrogen :** 10 mg/L
- **Total Phosphorus:** 2 mg/L

(3) Air pollution

(a) Urban Air pollution

(b)Transboundary haze pollution

(a) Urban Air Pollution

Air quality monitoring system in Yangon City Area

Location of monitoring

(1) Botataung township
(2) Hlaing Township (International Business Centre)
(3) Dagon township

Method – Ambient Air quality monitoring Station with mobile car (AQMS mobile car) compact.

Measurements (6) types

(1)Particulate matter 2.5 ($PM_{2.5}$)
(2) Particulate matter 10 (PM_{10})
(3) Sulphur Dioxide (SO_2)
(4) Nitrogen Dioxide (NO_2)
(5) Ozone (O_3)
(6) Carbon monoxide (CO)

Note – As of 11 April 2026 measurement Air Quality is good according to Air Quality Index (AQI)

Air Quality Index (AQI)

0- 50	Good
51- 100	Acceptable
101- 150	danger for low resistant person
151- 200	danger for health
201- 300	Seriously danger for health
301- 500	Hazard for health

Yangon Air Quality Index on 7th May 2026

Transboundary Haze Pollution

According to "ASEAN Specialized Meteorological Center ASMC" announcement

- Fire hotspot is alert level (3) start from 27th March 2026
- And also according to NOAA-20 satellite watch, it was expected increasing of Fire Hotspot.(NOAA-National Oceanic and Atmospheric Administration)
- No of fire hotspot detected in 2026 March 25th and 26th in Mekhong Region are 2806 no and 3139 no respectively. (Especially spread area in Myanmar and Lao PDR)
- Expected alert level of Transboundary haze pollution and Fire Hotspot can be increased.

Activities

(1)Myanmar is one of the members of "ASEAN Agreement on Transboundary Haze Pollution – AATHP" since 2003.

(2)Plan to free from Haze in 2030 by the Road Map of 2023-2030.

(3) Also participating to reduce the no of Fire Hotspot in Mekhong Region by means of index develop by 2017 Chaingrai Work Plan.

(4)In 2013 April 7th joint committee meeting between Lao, Myanmar and Thailand was held and developed "Joint Plan of Action-Clear Sky Strategy"

(5)Also working committee are organized in States and Divisions for reducing and controlling the Fire Hotspot.

(6) Conduct awareness and educational program and also monitoring system and talk show for watching air pollution.

(7) Myanmar will jointly participate with Lao PDR and Thailand for reducing of haze pollution and Fire Hotspot.

Responsible Ministry and Departments regarding Environmental Affairs

- Ministry of Natural Resources and Environmental Conservation (MONREC)

The specific department with this ministry tasked with environmental management is the Environmental Conservation Department (ECD)

Responsibilities

-Implementing the Environmental Law and Rules

-Conducting Environmental Impact assessment (EIA)

-Monitoring industry compliance regarding waste disposal.

Continued

- **Other Relevant Bodies**

(1) Forest Department (Under MONREC):

Manages protected areas and biodiversity conservation.

(2) National Environmental Conservation Committee:

Coordinates environmental policy across various government organization.

(3) Ministry of Agriculture, Livestock and Irrigation (MoALI):

Responsible for managing marine resources, coral reefs, and fisheries.

(4) Ministry of Health (MOH):

Manages aspects related to occupational and environmental health.

Myanmar Environmental Law

The Myanmar Environmental Law was enacted with (8) objectives and one of these is to enable to implement the "Myanmar National Environmental Policy".

- Environmental Conservation Law (2012)
- Environmental Conservation Rules (2014) for EIA, IEE and EMP
- The National Environmental Policy (2019) emphasizes a clean , healthy environment, sustainable development, and a "Zero-waste" approach.

References

- Internet
- Forest department, Ayeyarwady region
- Article, Thittaw Mg, 18-3-2026 Myanma Alinn Daily
- မြစ်များတမံများသဘာဝပတ်ဝန်းကျင်နှင့်ရွေးချယ်မှု Engg Hein Htet PE/ACPE/AFAAET
- Article, ECD 13-4-2026 Myanma Alinn Daily
- Article, Myanmar-Thai joint committee for prevention of transboundary haze pollution, 5-4-2026 Myanma Alinn Daily

Thank You