



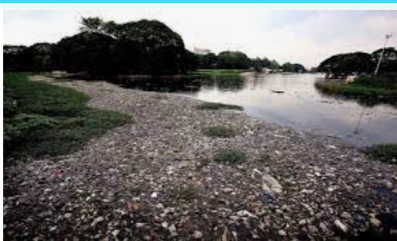
LIFE Blue Lakes Capacity Building Workshop Microplastics in Lakes

hosted by Global Nature Fund - 1 July 2021



Plastic waste and plastic litter in lakes - a general problem

presented by Nina van Toulon
Indonesian Waste Platform



water

Lack of fresh water is one of the most urgent environmental and development **issues** of the 21st century.

30 June 2021 [Why isn't water top of the climate agenda?](#)

In water-stressed Asia, governments and industry are only beginning to prioritise water risks. Non-technological innovations and greater political will are needed, said experts at Singapore International Water Week 2021.

Distribution global liquid surface fresh water

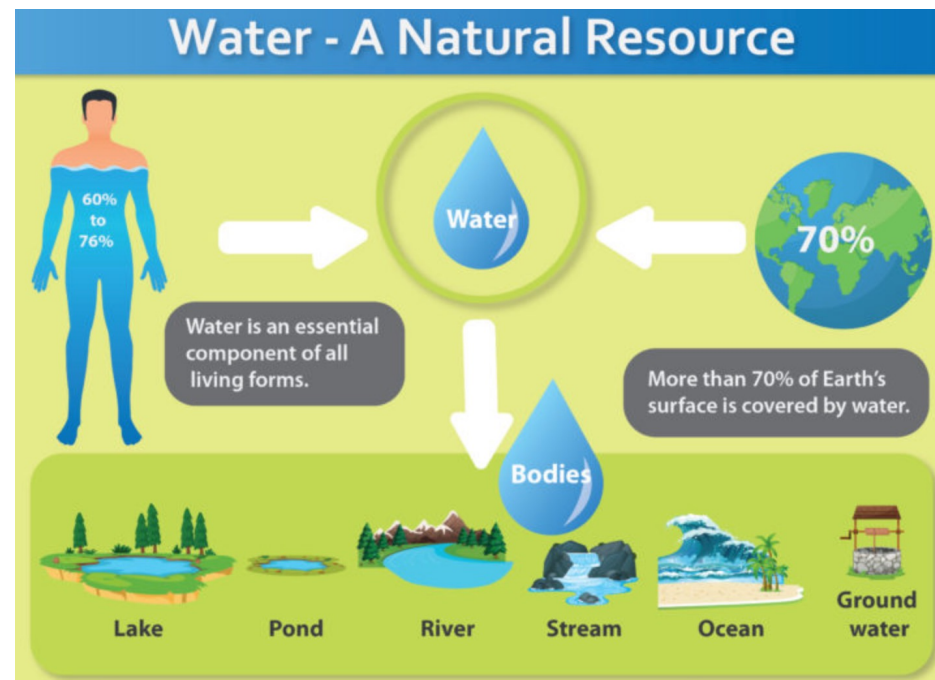
- 11% in swamps, and
- 2% in rivers
- **87% is contained in lakes**



Water is complex because it is linked to almost everything in the world.

Water is a precondition for human existence and for the sustainability of the planet

resource website [UN Water](#)



pollution in lakes - a neglected topic


60 million people rely on lakes and rivers for their livelihood

Lakes and rivers are an essential source of

- protein,
- micronutrients,
- vitamins and fats for diets particularly in developing countries

source [FAO](#)



- Human activity causes lake pollution
- 
- Polluted lakes impact humans and biodiversity

Negative impact polluted lakes

- degradation of natural lake ecosystem
- declining freshwater fish populations
- impact on agriculture - irrigation crops near lake shores
- human health
- drinking water source
- tourism

Google search recommended '[polluted lakes](#)'

You will find that most lakes on our planet are polluted



pollution and salination in the world's 25 largest lakes - a review

Pollution and salination in the world's 25 largest lakes affect livelihoods, fresh water source, biodiversity and public health in communities in 20 countries



Azerbaijan, Bolivia, Burundi, Canada, Democratic Republic Congo, Ethiopia, Iran, Kazakhstan, Kenya, Kyrgyzstan, Malawi, Mozambique, Nicaragua, Peru, Russia, Tanzania, Turkmenistan, Uganda, USA, Zambia

[Link to review](#)

sources of pollution in lakes from human activity near shorelines

industrial

- industrial wastewater
- [mining](#)
- cement
- nuclear waste
- chemicals



China, steel plant located near Weishan Lake

2020 India “97 polluting industries near [Bellandur Lake](#) get closure notices”

2018 Russia [Lake Karachay](#) The Most Radioactively Polluted Place on Earth

2020 Canada “[Lake Ontario](#) ‘aquatic landfill’ to contain 150-year-old toxic blob from industrial pollution”

agricultural

- pesticides / herbicides
- manure
- plastic



2018 USA [The Toxic Tour of Lake Apopka](#)

2020 Recent research, [published in Environmental Pollution in late 2020](#), levels and persistence of pesticide pollution in recreational lakes.

Fisheries in lakes

- Styrofoam
- fishing gear, nets, ropes
- oil from vessels
- paint from vessel repair

municipal

- households
- Businesses /companies including tourism sector

materials

- domestic sewage (chemicals, meds/antibiotics, [anti-depressiva](#), faeces, urine, bacteria, microfibers from washing machines, contact lenses) , wetwipes
- building waste
- **(plastic) litter**
- **plastic diapers !**



2019 Malawi [Lake Malawi](#)

2021 USA [Lake Michigan](#) plastic pollution poses ecological and social threats



a global issue - plastic diaper pollution in lakes (and rivers)

Prigi Assandi : “(In Indonesia,) 80 per cent of our drinking water is from surface water. And diapers poison our rivers. What we throw is what we will consume”
[publication](#) 26 June 2021



Volunteers of Diaper Evacuation Brigade in action. (Photo: Diaper Evacuation Brigade)

Single-use nappies and their alternatives
Recommendations from Life Cycle
Assessments

[Publication](#) is commissioned and supervised by the United Nations Environment Programme and the Life Cycle Initiative (Economy Division)



[free posters](#) in English (UK and US), Dutch, Filipino, French, Hindi, Indonesian, Malay, Portuguese, Swahili, Turkish and more languages coming soon !

BREAK OUT SESSION





- Indonesia's lakes
- 35 large lakes throughout the archipelago reviewed
- Indonesia's 10 largest lakes
- history of limnology in Indonesia
- IWP litter prevention approach in rural & remote regions
- challenges prevention of plastic pollution in lakes in Indonesia
- stakeholders and Extended Producer Responsibility
- about Indonesian Waste Platform

Indonesia's lakes

Indonesia has at least 521 natural lakes.
This doesn't include man-made lakes.

types of lakes in Indonesia

- volcanic lakes - formed by volcanism or volcanic activity
- tectonic lakes - formed by the decline in the face of the earth due to shifting / faulting
- glacial and ephemeral* floodplain lakes - formed by rivers that flood and cover plains which are generally mud and sand

* Definition of **ephemeral** waterbody is a wetland, spring, stream, river, pond or **lake** that only exists for a short period following precipitation or snowmelt.

Indonesia's lakes are valuable assets

- freshwater source
- food security (fisheries / waterfowl)
- irrigation
- tourism
- hydropower [2016 update](#)
- natural water purification



pollution in lakes

- causes a downward spiral and has a negative impact on all of the above



35 large lakes throughout the archipelago reviewed



A 1994 review shows that

- many lakes have undergone major changes over the past decades, often resulting in degradation, and development plans threaten to disturb those relatively unaffected up to now
- dams occur in one third of all lakes and have been planned in another five (data 1994)
- siltation is a major problem in at least three lakes, while the introduction of water hyacinth and exotic fishes has been ubiquitous
- losses of fishery production and fish extinctions are apparent, although poorly documented
- a combination of surveying, data evaluation and the formulation of a national strategy for the wise use of Indonesia's lakes and lake resources is urgently required to curb further loss of natural assets.



recent data??

[source](#) 1994 publication 'Indonesia's major freshwater lakes: A review of current knowledge, development processes and threats' by Wim Giesen

Indonesia's 10 largest lakes



[source](#)



7. Danau Paniai

Area: 145 km² (14,500 hectares)

Maximum Depth: 50m

Lake Type: **Tectonic**

Province: Papua

Papua

8. Danau Rombebai

Area: 137.49 km² (13,749 hectares)

Lake Type: **Floodplain**

Province: Papua

Papua

1. Danau Toba

Area: 1,130 km²

Maximum Depth: 529m

Lake Type: **Volcanic**

Province: North Sumatra

Sumatera

3. Danau Poso

Area: 323.2 km²

Maximum Depth: 450m

Lake Type: **Tectonic**

Province: Central Sulawesi

Sulawesi

5. Danau Matano

Area: 164.1 km²

Maximum Depth: 590m

Lake Type: **Tectonic**

South Sulawesi Province

Sulawesi

9. Danau Tempe

Area: 130 km² (13,000 hectares)

Maximum Depth: 5m

Lake Type: **Tectonic**

South Sulawesi Province

Sulawesi

6. Danau Jempang

Area: 150 km² (15,000 hectares)

Maximum Depth: 6m

Lake Type: **Floodplain**

Province: East Kalimantan

Kalimantan

10. Danau Semayang

Area: 130 km² (13,000 hectares)

Maximum Depth: 6m

Lake Type: **Floodplain**

Province: East Kalimantan

Kalimantan

2. Danau Towuti

Area: 561.1 km²

Maximum Depth: 203m

Lake Type: **Tectonic**

South Sulawesi Province

Sulawesi

4. Danau Sentarum

Area: 275 km²

Maximum Depth: 8m

Lake Type: **Floodplain**

Province: West Kalimantan

Kalimantan

history of limnology in Indonesia

The development of limnology in Indonesia may be divided into three periods: prior to 1950; between 1950–1970; and after 1970 [source](#)

1928–1929

The most significant early contribution during the first period was made by the ‘Sunda Expedition’ in 1928–1929 (led by Franz Ruttner) which involved intensive investigation of the islands of Sumatra, Java and Bali.

1950–1970

Little limnology was undertaken subsequently until the second period (1950–1970), when the Inland Fisheries Research Institute began several limnological investigations to support fisheries development.

since the 1970s

Growing concern over environmental matters since the 1970s distinguished the third period of limnology, when the science began to grow to support fisheries and to provide solutions to various environmental problems.

early 1991s

In early 1991, the National Committee on Hydrological Programme and the Indonesian Society of Limnology were established to promote the growth of limnology in Indonesia. Among the main obstacles to the further development of limnology in Indonesia are a general lack of relevant education, facilities and research funds, as well as obstacles to communication and difficulty in accessing publications.

Basic and applied limnological work is carried out by government institutions - **Inland Fisheries Research Institute, the Department of Public Works, and the [Research and Development Centre for Limnology](#)**, as well as by universities, and environmental consultants contribute to limnological studies in relation to environmental impacts.)

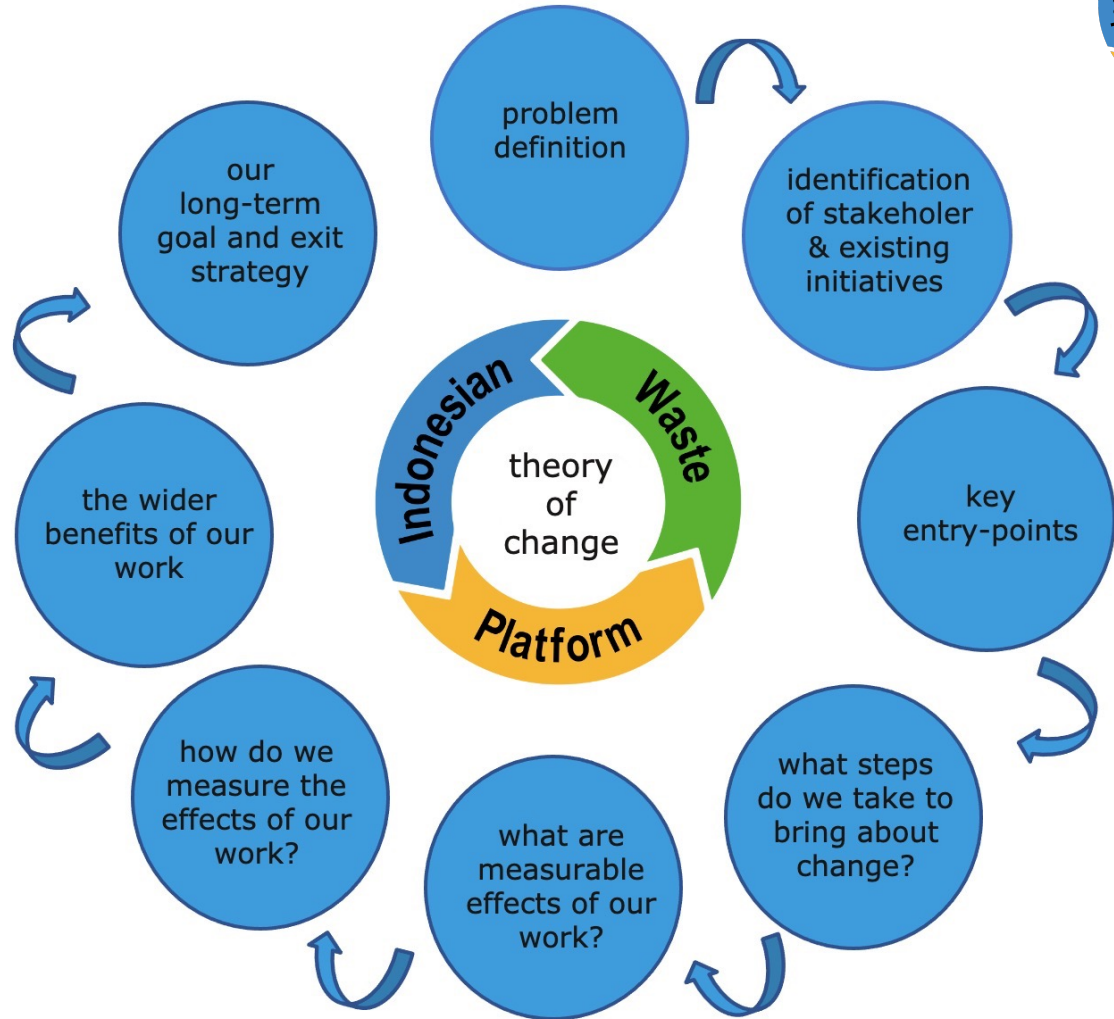


IWP litter prevention approach in rural & remote regions



community-led waste management development
four inter-related and integrated programs

IWP [Theory of Change](#)



link to [programs](#) and reduction campaign materials

stakeholders and Extended Producer Responsibility



it is essential to establish a network with all relevant stakeholders

- community leaders
- grass-root organisations
- educators; academia, universities & student groups
- local champions
- governmental organisations
- recycling sector
- **producers / brand-owners (Extended Producer Responsibility)**



depending on existing legislation producers are or are not responsible to support recycling efforts – they can support for covering transport costs of recyclables, education materials. If not regulated by law then hopefully voluntary.



challenges prevention of plastic pollution in lakes in Indonesia



local framework

lack of

- implementation of local strategy, framework, policies, legislation (waste roadmap)
- lack of implementation of reduction measures (bans - phase out single-use plastics; introduction of alternative delivery models - refilling)
- cross-sector stakeholder collaboration
- structurally embedded waste & climate literacy in local school curricula

municipal solid waste management infrastructure

lack of

- waste segregation at household level
- collection system
- mechanical recycling facilities within reach

complicating factor in Indonesia

- **distances to mechanical recycling facilities**
- transport costs of recyclables versus value of recyclables

packaging composition

- **low recyclability properties**
- **packaging not designed for recycling**
 - choice of materials
- lack of refilling from bulk

Indonesian Waste Platform



Indonesian Waste Platform

- founded in 2010 in East Indonesia on Flores as a network organization
- evolved into a national network by 2015
- registered as an Indonesian non-for-profit association in 2018

we develop best-practices with a focus on rural & remote regions (45% of Indonesian population)

IWP supports implantation of the national strategy laid out in [Indonesia's National Plan of Action 2017 – 2025](#)

and the international strategies of the

- [UN SDG goals](#)
- [UNEP](#)

we were co-founding party of the [International Waste Platform](#)