The Ecological Footprint of East Asia

Understanding the Environmental Ossues

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EAST ASIA COUNTRIES:

China.
 Hong Kong.
 Japan.
 Macau.
 Mongolia.
 North Korea.
 South Korea.
 Taiwan.



Ecological Footprint of China, 1961 - 2016



Ecological Footprint of Japan, 1961 - 2016



Ecological Footprint of Korea, 1961 - 2016



Ecological Footprint of Mongolia, 1961 - 2016





Global Footprint Network, 2019 National Footprint Accounts

East Asia Country Comparisons, 2016

The carbon footprint is the largest total and per person contributor to the total footprint, except for Mongolia. Grazing is the largest contributor to the total footprint for Mongolia.

Global

Footprint Network®

Ecological Footprint of Countries 2016

The ecological footprint of East Asia suggests that greater demands are placed on the environment than what it can support.

> What are the problems and concerns that this situation creates?

Population growth and economic development contribute to many environmental problems in **East Asia**. These include:

- 1. pressure on land,
- 2. habitat destruction and loss of biodiversity,
- 3. water scarcity and water pollution,
- 4. air pollution,
- 5. global warming and climate change.
- 6. Trash/waste disposal.

According to a World Bank report, in 2016 the world generated two billion tons of municipal and household waste—up from 1.8 billion tons just three years earlier.

It projects that by 2050 the volume of such waste will grow by 50 percent in **East** Asia.









Population Density in East Asia

The population density in **East Asia** is 144 per Km² (372 people per mi²).



The Total GDP of Countries in East Asia, 1980 – 2015



The Average Annual Income per Person in East Asia, 1962 – 2015



Share of Global Carbon Emissions from Fuel Combustion







Mammal species threatened

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Plant species (higher) threatened

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Country	Mammals	Birds	Reptiles	Amphibs	Fishes	Mollusks	Other Inverts	Plants	Fungi	TOTAL
China	72	96	47	87	137	15	64	596	1	1115
Hong Kong	4	21	5	5	16	1	8	10	0	70
Japan	29	49	25	20	77	33	143	50	4	430
North Korea	10	29	2	1	21	0	3	17	0	83
South Korea	12	33	3	5	29	0	8	33	1	124
Масао	0	4	1	0	10	0	1	0	0	16
Mongolia	11	24	0	0	2	0	3	0	0	40
Taiwan	12	24	9	10	75	1	128	85	1	345
TOTAL	150	280	92	128	367	50	358	791	7	2223

Endangered and Threatened Species in East Asia, by Country (2019)





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China's Education Spending On The Rise

(SOURCE: Ministry of Education)



Changes in Education Spending and Urban Populations in China



What are China's Environmental Problems?

Air Pollution (outdoor and indoor) Water Pollution Water Shortages Soil Pollution Soil Degradation Accumulating Wastes

Beijing a day after rain

1.6 million people in China are estimated to have died in 2013 from air pollution alone More than half the water in major covers in eight **20%** concerning is the material in the point of the point of

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$PM_{2.5}$ Over China



PM _{2.5}	Air Quality Index
0 to	Good
12.0	0 to 50
12.1 to	Moderate
35.4	51 to 100
35.5 to 55.4	Unhealthy for Sensi- tive Groups 101 to 150
55.5 to	Unhealthy
150.4	151 to 200
55.5 to	Unhealthy
150.4	151 to 200
150.5	Very Un-
to	healthy
250.4	201 to 300

500.4

China's Water Pollution and Shortage



CHINA'S FRAGILE FURESTS BY SEAN GALLAGHER









Forest Cover Change in China, 1949 - 2035





Much of the increase in forest area has occurred in southern China, which has been planted to non-native eucalyptus forests.





The Giant Panda Range, Historic and Current





Some of the Endangered Species in China

Primates/Monkeys

- Lar gibbon
- Black crested gibbon
- Hainan black crested gibbon
- Northern white-cheeked gibbon
- Eastern black crested gibbon
- Western hoolock gibbon
- Eastern hoolock gibbon
- Black snub-nosed monkey
- Golden snub-nosed monkey
- Gray snub-nosed monkey
- Myanmar snub-nosed monkey
- Stump-tailed macaque
- Rhesus macaque
- Tibetan macaque
- Assam macaque
- Formosan rock macaque
- Southern pig-tailed macaque

- François' langur
 White-headed langur
 Phayre's leaf monkey
- Shortridge's langur
- Nepal gray langur
- Bengal slow loris
- Pygmy slow loris

Some of the Endangered Species in China

Pandas/Bears

- Red panda
- Giant panda
- Sun bear
- Brown bear
- Tibetan blue bear
- Himalayan brown bear
- Asian black bear

Cats

- South China tiger
- Siberian tiger
- Indochinese tiger
- Bengal tiger
- North-Chinese leopard
- Amur leopard
- Indochinese leopard
- Snow leopard
- Clouded leopard
- Leopard cat
- Wildcat
- Chinese mountain cat
- Jungle cat
- Eurasian lynx
- Pallas's cat
- Asian golden cat
- Fishing cat
- Marbled cat

Elephants/Rhinos

- Indian elephant
- Javan rhinoceros
- Sumatran rhinoceros

Some of the Endangered Species in China

Deer

- Przewalski's horse
- Mongolian wild ass
- Tibetan antelope
- Przewalski's gazelle
- Mongolian gazelle
- Goitered gazelle
- Père David's deer
- Thorold's deer
- Shika
- Indochinese hog deer
- Eld's deer
- Red deer

- Sichuan deer
- Moose
- Water deer
- White-bellied musk deer
- Alpine musk deer
- Black musk deer
- Siberian musk deer
- Anhui musk deerDwarf musk deerJava mouse-deer

Causes of Species and Biodiversity Loss in China

- 1. Deforestation (habitat loss)
- 2. Forest Fragmentation (habitat loss)
- **3.** Alteration of habitat (changes in structure, species composition, invasive species)
- 4. Water, soil and air pollution
- 5. Illegal Wildlife Trade
- 6. Harvesting animal parts for traditional/cultural medicines

7. Eating of animals based on cultural beliefs8. Climate Change

Laws and Enforcement

New wildlife protection laws (WPL) went into effect in 2017.

The WPL assigns most responsibility for its implementation to provinciallevel government departments, including responsibility for issuing trading permits and production quotas, but does not establish mechanisms for central planning, supervision or accountability.

Captive breeding of wildlife for commercial purposes is still allowed, as long as a license is obtained from provincial-level government authorities.

•The WPL in general prohibits the sale, purchase, or use of rare or nearextinction wild animals, and their products, that are under special national protection.

The WPL restricts construction projects in nature reserves.

The new Law expands the hunting methods prohibited by the old Law to include poisons, explosives, electronic shock, electronic trap devices, snares, leg-hold traps, makeshift guns, etc.

Laws and China's Tigers

•China is the original 'tiger farming' country. The first 'tiger farm' was established in Northeast China in 1986, 13 years after international commercial trade in tigers and tiger parts was banned.

This was a Government-funded operation to breed tigers for profit, primarily to supply bones for use in traditional medicine.

Trade in tiger bones and rhinoceros horns, which are used in traditional Chinese medicine, were officially banned in China by a 1993 State Council circular.

It is unclear whether the WPL will do much to deter this practice as international observers have found that tiger farms openly marketed products containing tiger parts and many of them stockpiled tiger carcasses in the hope that a legalized tiger trade would one day be reopened.

Japan

Japan has dealt with similar problems as China, but historically has been more advanced and proactive.

The fact it is an island nation, and has a higher population density than China (874 people/mi² vs. 375 people/mi²) has forced it to evolve more quickly.

After World War II Japan very rapidly rebuilt infrastructure and manufacturing in efforts to restore its culture and livelihoods.

The mentality of rebuild, restore, produce and clean later brought on an onslaught of pollution issues, for which it has been forced to deal with.

It is ahead of China in this regard, but also has less cultural issues to deal with than China that hamper efforts.

Comparison of the Ecological Footprint between China and Japan, 2016

Japan

Japan's Basic Law for Environmental Pollution Control was enacted in 1967 and the Environment Agency was established four years later and about the same time as the EPA was established in the US..

Today, Japan deals with:

- 1. Air pollution
- 2. Water pollution
- 3. Waste disposal
- 4. Loss of species and Biodiversity

Because it is an island nation water and marine issues are more prevalent.

The earthquake and tsunami in 2011 exacerbated this, particularly with the Fukushima Daiichi nuclear power plant.

Some believe that over 60 million Japanese have been exposed to radiation by the Fukushima nuclear plant, covering some 50,000 sq. miles of Japan.

The debate continues today, with scientists and government officials giving the "all clear" sign, while many others remain skeptical.

Radiation Levels Around Japan

Monday March 21, 2011

All measurements in microsieverts per hour Aomori 0.022 0.034 Morioka uSv/h Akita 0.035 All readings between 0.19 Sendai 4:00 - 5:00 p.m. Yamagata 0.100 7.47 Fukushima Except Fukushima 8:00 p.m. Niigata 0.046 Sendai 9:30 a.m. Fukushima Dai-ichi (No. 1) Fukushima Dai-ni (No. 2) Nagano 0.057 2.09 lwak 0.133 Utsunomiya 0.340 Mito 0.082 Chiba 0.125 Tokyo 0.058 0.106 Kofu Saitama 0.085 0.046 Maebashi Shizuoka 0.083 anagawa

Forest Cover and Human Population Changes in Japan

Species Status in Japan

As of 2018, a total of 3,675 flora and fauna species are red-listed in Japan as being endangered and threatened with extinction.

- 44 species were added in 2018
- 2 species (both birds) were declared extinct.

If you include the 56 marine species, the total species count goes to 3,731

It is not just the loss of forests, but also the changes in forest habitat (by humans), the fragmenting of forests, and the introduction of invasive species and pollution.

Climate change forces species (flora and fauna) to migrate northward and into higher elevations; however, if there is no habitat to move into the species will suffer "To keep every cog and wheel is the first precaution of intelligent tinkering"

- Aldo Leopold

"The earth will not continue to offer its harvest, except with faithful stewardship. We cannot say we love the land and then take steps to destroy it for use by future generations."

- Pope John Paul II

