Population and the Environment

The Global Challenge

As the century begins, natural resources are under increasing pressure, threatening public health and development. Water shortages, soil exhaustion, loss of forests, air and water pollution, and degradation of coastlines afflict many areas. As the world's population grows, improving living standards without destroying the environment is a global challenge.

Most developed economies currently consume resources much faster than they can regenerate. Most developing countries with rapid population growth face the urgent need to improve living standards. As we humans exploit nature to meet present needs, are we destroying resources needed for the future?

Environment Getting Worse

In the past decade in every environmental sector, conditions have either failed to improve, or they are worsening:

Public health. Unclean water, along with poor sanitation, kills over 12 million people each year, most in developing countries. Air pollution kills nearly 3 million more. Heavy metals and other contaminants also cause widespread health problems.

Food supply. Will there be enough food to go around? In 64 of 105 developing countries studied by the UN Food and Agriculture Organization, the population has been growing faster than food supplies. Population pressures have degraded some 2 billion hectares of arable land—an area the size of Canada and the US.

Freshwater. The supply of freshwater is finite, but demand is soaring as population grows and use per capita rises. By 2025, when world population is projected to be 8 billion,48 countries containing 3 billion people will face shortages.

Coastlines and oceans. Half of all coastal ecosystems are pressured by high population densities and urban development. A tide of pollution is rising in the world's seas. Ocean fisheries are being overexploited, and fish catches are down.

Forests. Nearly half of the world's original forest cover has been lost, and each year another 16 million hectares are cut, bulldozed, or burned. Forests provide over US$400 billion to the world economy annually and are vital to maintaining healthy ecosystems. Yet, current demand for forest products may exceed the limit of sustainable consumption by 25%.

Biodiversity. The earth's biological diversity is crucial to the continued vitality of agriculture and medicine—and perhaps even to life on earth itself. Yet human activities are pushing many thousands of plant and animal species into extinction.

Two of every three species is estimated to be in decline.

Global climate change. The earth's surface is warming due to greenhouse gas emissions, largely from burning fossil fuels. If the global temperature rises as projected, sea levels would rise by several meters, causing widespread flooding. Global warming also could cause droughts and disrupt agriculture.

Table 2. Types of Possible Adverse Effects Upon Health Due to Global Environmental Change

		Direct Health Effects		*Indirect Health Effects*	
Environmental Change	***Manifestation***	***Early***	***Late***	***Early***	***Late***
Enhanced greenhouse effect	*Global warming and climate change*	Heatwave-related illness and deaths		Altered distribution of vector-borne infectious diseases. Food shortages due to altered agricultural productivity	Reduced viability of edible fish in warmed oceans
Stratospheric ozone depletion	*Increased ultra-violet radiation at earth's surface*	Sunburn, photo keratoconjunctivitis. Suppression of immune system—increased risk of infection, cancer.	Skin cancer. Ocular effects: cataracts pterygium		Impaired growth of food crops and of marine microorganisms.
Acid emissions (from combustion of sulphurous follil fuels)	*Acid rain (and other precipitation)*	Possible effects on respiratory system		Killing of aquatic life—rduced food. Impaired crop growth.	Impairment of forest growth; reduced ecosystem productivity
Land degradation: over-intensive agriculture and excessive grazing	*Erosion, sterility, nutrient loss, salinity; desertification*	Decline in agricultural productivity	Rural depression—migration to fringes of cities (shanty towns)	Exposure to higher levels of pesticides and fertilizers; may lead to toxic algal blooms in waterways	Consequences of silting up of dams and rivers

Depletion of plants and animals; loss of biodiversity	*Destruction of habitat* *Loss of genetic diversity; weakening of ecosystems*	Deforestation: disruption of local culture and health	Shortages of edible species	Loss of medical chemicals and other heatlh-supporting materials	Deforestation—greenhouse enhancement. Greater vulnerability of plants and livestock. Decline in vitality of ecosystems.

Note: The designztions "early" and "late" are only to indicate the relative time of occurrance
Source: Adapted from McMichael, 1993 (151)

Toward a Livable Future

How people preserve or abuse the environment could largely determine whether living standards improve or deteriorate. Growing human numbers, urban expansion, and resource exploitation do not bode well for the future. Without practicing sustainable development, humanity faces a deteriorating environment and may even invite ecological disaster.

Taking action. Many steps toward sustainability can be taken today. These include using energy more efficiently; managing cities better; phasing out subsidies that encourage waste; managing water resources and protecting freshwater sources; harvesting forest products rather than destroying forests; preserving arable land and increasing food production through a second Green Revolution; managing coastal zones and ocean fisheries; protecting biodiversity hotspots; and adopting an international convention on climate change.

Stabilizing population. While population growth has slowed, the absolute number of people continues to increase—by about 1 billion every 13 years. Slowing population growth would help improve living standards and would buy time to protect natural resources. In the long run, to sustain higher living standards, world population size must stabilize.

NECESSARY CHANGES

1. Reduce Greenhouse Gas Emission to zero
2. Stop all actions that cause loss of bio-diversity
3. Stop cutting of forests- all paper is to be recycled
4. Irrigation pipe to prevent loss of water
5. Non-tillage techniques of gardening to improve soil life
6. Gardening techniques so people can produce food
7. Live in ARC cities to reduce energy consumption, decentralize cities. All cities occupy on 2% of the Earth's surface
8. Development of new non-polluting energy sources
9. Plan locations of ARC Cities based on survivability quotients
10. Politics of ARC cities more like Greek and Swiss city state
11. Plan disposal of millions of bodies before disease sets in (Soylent Green movie concept)
12. Reduce population growth
13. Reduce consumption in developed countries
14. Find new motivators for work
15. Eliminate profit and control from work by wealthy

16. Create more equal distribution of wealth- elimination of poverty
17. Create education on how to live in the In-Harmony System
18. Start worldwide gardening programs to increase soil vitality
19. Provide pedal power water pumps for irrigation
20. Provide water filters to give safe drinking water to people
21. Eliminate all combustion engines
22. Eliminate aerosols and air pollution by industry
23. Family planning education
24. Elimination of meat eating –change in food production patterns, this will also stop the buildup of POP chemicals from lower animals in the food chain
25. Development understanding of Microbe relationship to human body and soil
26. Clean up of toxic waste including mercury, copper, arsenic, asbestos and organic pesticides must start. No chemicals put into the ground and toxic waste clean up of aears that are leaching into ground water.
27. Disease control of tuberculosis, malaria, diarrhea, AIDS, Cholera and hepititus
28. Elimination of chronic diseases like cancer, diabetes, and heart disease through healthy lifestyle
29. Air pollution will drop when the ARC System is used.
30. Stop all burning of combustibles for cooking and heating with improper ventilation
31. Smog production from vehicles will stop once ARC Systems are in place.
32. Require all vehicles to have smog control
33. Change vehicles to electric with battery storage
34. Acid air and acid rain reduce crop and forest production
35. Increase plant pollinators such as birds, bees, bats, butterflies and beetles.
36. Do not eat shell fish because of paralytic shellfish poisoning
37. Watch contamination of deep sea fish
38. Increase in temperature causes disease increase for malaria, dengue fever and schistosomiasis worms from insect, water snail and virus vectors. Open irrigation ditches allow these vectors to occur. A pipe system eliminates this
39. Desalinization of soil through flushing techniques of salt free water
40. Provide freshwater for bio-diversity in marshes, rivers and lakes
41. Eliminate coastal development such as construction, urban expansion, sand dredging, and harvesting coral reefs for building material.
42. Cultivate sea grass and sea weed production through natural methods
43. Try to stabilize Coral Reefs for bio-diversity upwards of 1 million species. Coral reefs are being buried by sediment washed off the land, poisoned by industrial and agricultural chemicals, reduced to rubble by fishermen using dynamite, damaged by boat anchors and careless divers, excavated for use as building material, and bleached white by warming ocean temperatures.
44. Elimination of all urban sewage into the ocean or rivers
45. Monitor fishing levels in the oceans. In 1994 the Law of the Sea Convention established a foundation for sustainable ocean management.
    a. Plans for conserving marine biodiversity must take account of human needs.
    b. Educating the public and raising awareness must play a role in better marine management.
    c. Communities must have the opportunity to protect and manage their own coastal resources.
    d. Social and economic incentives must be created for conservation and sustainable use of ocean resources.
    e. Policies must reflect the fact that the world's oceans are connected.
    f. Governments must take the lead in managing their own waters, while cooperating with neighboring states.
46. Employ massive tree replanting
47. Stop cutting of Amazon and Malaysian forests
48. **What Can Be Done to improve the Forests?** As population grows and per capita consumption of forest products increases, countries must do more to manage forest resources on a sustainable basis. The following developments offer encouragement:

a. **Technological improvements.** Technological improvements, including use of recycled paper and paperboard, have substantially reduced the amount of pulp needed to produce paper. In 1970 paper and paperboard consisted of 80% wood pulp. By 1997 more efficient production processes had reduced that figure to 56%. As a direct result, the production of pulp for paper is expected to grow by just over 1% a year over the next decade, about half the growth rate in the 1980s .

b. **Forest products certification.** Adopting a system that identifies forest products that come from sustainably managed forests could support efforts toward sustainability. As of 1998, about 10 million hectares of forest lands have been certified (276). Over 90% of the certified area is in northern, temperate forests, mostly in Europe and North America. Close to 60% of the entire certified area is in just two countries--Sweden and Poland--reflecting education and awareness campaigns in those countries . In tropical forests, where most of the destruction is taking place today, only tiny areas have been certified as providing sustainable yield.

c. **Intergovernmental responses.** In 1995 the Intergovernmental Panel on Forests (IPF) was established in response to the 1992 Earth Summit. The IPF evolved into the Intergovernmental Forum on Forests in 1997, after the UN's five-year review of the Earth Summit goals. The mission of the forum is to examine the underlying causes of deforestation and to help countries develop strategies that address them.

49. **Stabilize Bio-diversity Hotspots -**Biodiversity hotspots are areas that contain a superabundance of plant and animal species but are threatened by human activities. Of the world's 25 terrestrial hotspots, 9 are in tropical rainforests, 5 include both wet and dry tropical forests, and another 5 consist of temperate Mediterranean-type ecosystems. In addition, three include tropical rainforest, dry forest, and arid systems; another is a mosaic of dry forest and savannah; while another is temperate forest and steppe; and the last is an arid region. An estimated 75% of all terrestrial animal species considered endangered or threatened live within these 25 hotspots.

. **a. Protect hotspots.** As more organizations focus on protecting hotspots, the species within them might stand a better chance of survival. In 1989 Conservation International and the MacArthur Foundation became the first organizations to adopt the concept of biodiversity hotspots as a guiding principle for investments in environmental conservation. As new hotspots in marine areas are identified and added .
. to the 25 currently identified terrestrial hotspots, protection should be extended to them, as well.

. **b. Safeguard protected natural areas from development.** Over the past two decades population pressures and a shortage of arable land have forced some 200 million landless peasants out of traditional farming areas and onto protected land rich in biodiversity. These "shifted cultivators," as Myers has termed them, have little choice but to exploit the animal and plant species in these "biological oases". To protect these natural areas, more must be done to help farmers settle on productive land, while stemming the future flow of population into protected natural areas.

. **c. Implement the Convention on Biological Diversity.** This Convention, which was opened for signature at the Earth Summit in Rio, took force in December 1993 and so far has been ratified by 175 countries. The Convention has three major objectives: conserving biodiversity, ensuring its sustainable use, and . guaranteeing the fair and equitable sharing of its benefits.

Assuring a livable future requires practicing sustainable development. Enabling people around the world to meet their current needs without depriving future generations of the resources needed to meet their needs poses a challenge. Currently, humanity is using about one-third more of the earth's biological productivity than can be regenerated (Ecological Footprint of 1.29). To achieve sustainable development, people must learn, in effect, to live on the world's “ecological interest” instead of drawing down its “ecological capital”.

Debate continues about how best to accomplish sustainable development. Nevertheless, in a number of areas, progress is being made. Particularly important are:

- Improving energy efficiency;
- Planning cities better or change to ARC City concept
- Ending environmentally destructive subsidies;
- Adopting water resources management;

- Saving forests;
- Accomplishing a second Green Revolution, permanent-bed labor intensive
- Managing coastal zones and ocean fisheries;
- Curbing pollution, improving health;
- Safeguarding biodiversity; and
- Stabilizing world population

Improving Energy Efficiency

Using energy more efficiently is becoming one of the world's highest priorities and greatest challenges. The 20% of humanity in the most affluent countries consume close to 60% of the world's commercial energy. Nonetheless, most industrialized countries use energy more efficiently than developing countries, which often do not have the means to invest in energy-saving technologies or pollution control measures.

Since the oil crisis of 1973, developed countries have adopted energy efficient and cost-effective technologies. These technologies include more efficient heating and cooling systems, better insulation, and lighting and appliances that use far less energy per unit of output. Energy efficiencies also are rising as industrial processes become less energy-intensive and as electric utilities find that selling energy conservation—referred to in the industry as "megawatts"—pays. Switching to renewable energy sources, such as wind, solar, and geothermal energy, is another improvement in conservation. Renewable energy sources are increasingly competitive in price compared with fossil fuels, and they cause little or no pollution.

The following actions also could help conserve energy but do not go far enough to solve problems at an ecological level.

- **Encourage the design and use of low-energy buildings**. In India, for instance, Development Alternatives, a nongovernmental organization, has designed a simple, adobe-like house that needs no air conditioning. It is made from specially designed blocks that permit airflow and a new roofing tile made from micro-concrete, free from chemicals and synthetic fibers.
- **Eliminate government subsidies for fossil fuels.** In 1991 direct subsidies for fossil fuels totaled US$220 billion worldwide. Eliminating these wasteful subsidies, paid for with public tax money, and offering tax incentives (subsidies) for wind- and solar-powered energy generation would encourage their development.
- **Encourage energy efficiency programs in industry.** Most industrialized countries have voluntary programs to encourage energy efficiency at work sites. Developing countries are starting such programs, too. China, for instance, has introduced worker bonuses for ideas that lead to more efficient energy use. Since 1990 these programs have resulted in savings of some US$6 billion through energy efficiency improvements, which have increased Chinese industrial competitiveness.
- **Invest in public transportation.** Encouraging public transportation as an alternative to individual vehicles in urban areas is difficult. But it is becoming increasingly needed as urban populations and vehicle use increase. Finding ways to get more people to use public transport would go far to reducing pollution and saving energy.
- **Introduce "hypercars."** Hypercars—vehicles that run 80 to 100 miles per gallon of gasoline (petrol)—already are available but have not been produced in large numbers because demand is lacking. Making such vehicles readily available would be a sound investment, perhaps promoted by offering government rebates for their purchase. They are especially needed in smog-ridden urban areas.
- **Public transportation.** One of the best investments that cities can make—both environmental and economic—is an efficient mass transportation system. In many cities people waste great amounts of time and fuel going nowhere because traffic congestion is severe. In many urban areas vehicular exhausts account for 50% to 70% of polluting emissions. Curbing the number of motor vehicles by offering transportation alternatives would save energy and reduce pollution. Some cities—for example, Amsterdam and Copenhagen—have helped ease the transportation crisis by creating special traffic lanes for bicycles and by urging bicycle use.

- **Recycling.** Recycling mountains of urban waste into new resources makes sense both environmentally and economically. Recycling saves natural resources and reduces the amount of trash deposited in landfills or dumped into rivers, lakes, and the ocean. Also, for every million tons of solid waste, about 1,600 recycling jobs could be created in developed and developing countries alike.

Water Conservation.

Urbanization dramatically increases per capita freshwater use, as millions of households gain access to piped water, as industry increases, and as large-scale irrigated agriculture replaces subsistence farming. Cities everywhere need to adopt water conservation measures.

Environmental Resource Accounting

Environmental resource accounting attempts to place an economic value on "environmental goods and services" used—natural resources that conventionally have been regarded as free and used in common. These include unpolluted freshwater, clean air, ocean life, forests, and wetlands. A recent study by Robert Costanza of the University of Maryland estimated the total value of ecosystem services and products at US$33 trillion per year—an amount that exceeds the total value of the global economy as conventionally measured (US$29 trillion in 1998.

Some economists argue that the value of environmental goods and services should be incorporated into estimates of Gross Domestic Product (GDP), as are manufactured assets. Unlike manufactured capital, which depreciates in value over time, environmental capital (such as forests, fisheries, and unpolluted air and water) currently is not considered to depreciate, and no charge is made against current income as it is used. "A country could exhaust its mineral resources, cut down its forests, erode its soils, pollute its aquifers, and hunt its wildlife and fisheries to extinction, but measured income would not be affected as these natural assets disappeared," notes Robert Repetto of the World Resources Institute.

If natural resources were valued in the same way that manufactured assets are valued, it might help economies learn to use them more efficiently and to conserve them in order to assure continued use in the future. Such valuations also might help indicate the economic benefits of protecting the environment, as well as the ecological benefits. In other terms, instead of continuing to draw down their "environmental capital" until it is gone, economies could begin to live on its interest, maintaining the capital for use indefinitely in the future.

I = PxAxT

The equation I = PxAxT represents another effort to describe the overall impact of humanity on the environment. In the equation:

- **I** is environmental impact,
- **P** is population (including size, growth, and distribution),
- **A** is the level of affluence (consumption per capita), and
- **T** is the level of technology.

Using this formula and standard of human pre-industrial impact as a baseline, it might be construed that human impact at 1700 with 700 million people had a baseline impact of 700 million unit or 1 unit per person

with no industrialization.

We now have 7 billion people or 10 x as many. However our technological capabilities are at least 1000 x greater. So in effect we are equivalent to 7 TRILLION manpower units. That translates into humans having an environmental impact 10,000 times greater than just 300 years ago. Doubling the population impact over the next 50 years will yield human impact of over 30,000 times greater than just 350 years! When is it going to stop? How long can the Earth continue to function with this much influence from just one species?

Ecological Footprints of Nations

In 1997, as part of the five-year review of environmental conditions following the Rio Earth Summit, the Earth Council of Costa Rica sponsored a major "Ecological Footprints of Nations" study. The chief researcher was Mathis Wackernagel of the University of Anahuac de Xalapa in Mexico.

Wackernagel's study calculated, nation by nation, the biologically productive areas needed to provide the resources consumed by the population and to absorb their wastes, given prevailing levels of technology. As Wackernagel explained, "Everybody has an impact on the Earth, because they consume the products and services of nature. Their ecological impact corresponds to the amount of nature they occupy to keep them going. In other words, we calculate the `ecological footprints' of these countries".

Wackernagel and his group calculated the ecological footprints of 52 nations containing 80% of the global population and accounting for 95% of the World Domestic Product. The researchers concluded that the world's people are using about one-third more of the earth's biological productivity than can be regenerated.

Since 1989, humans have crossed the threshold of 1.0. For the last 22 years we have accelerated our consumption of resources to place us currently at the 1.29 level. By 2050 that number is projected to reach 2.0. Simply put, this can be understood as carrying capacity which refers to the maximum number of organisms a particular resource can sustain. The concept of carrying capacity, whilst understood by many cultures over history, has its roots in Malthusian theory. Environmental management is therefore not the conservation of the environment solely for the environment's sake, but rather the conservation of the environment for humankind's sake. This is comparable to running a car with no generator. When the battery dies, the car ceases to operate. Human consumption must be reduced immediately by all people for our own sake as well as the planet.

The problem with Ecological Footprints is that they only consider human activity requirements and do not consider the additional needs of the rest of Nature.

If all cities or nations were put side by side and their totals were all less than 1.0 there would still be the problem of give living space to Nature.

We MUST start giving Nature more space! The Ecological Footprint calculation must be used to establish new living patterns. Instead of the goal being 1.0, it must be closer to 0.3. By doing so, we will give the Earth a chance to reinvigorate itself from the constant depletion that has recently occurred. Humans need to respect other life and the resource needs of other beings, whether large or small.

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
United Arab Emirates	6.25	10.68	0.85	-9.83
Qatar	1.14	10.51	2.51	-8.00
Bahrain	0.76	10.04	0.94	-9.10
Denmark	5.45	8.26	4.85	-3.41
Belgium	10.53	8.00	1.34	-6.66
United States	308.67	8.00	3.87	-4.13
Estonia	1.34	7.88	8.96	1.08
Canada	32.95	7.01	14.92	7.91
Australia	20.85	6.84	14.71	7.87
Kuwait	2.85	6.32	0.40	-5.92
Ireland	4.36	6.29	3.48	-2.81
Netherlands	16.46	6.19	1.03	-5.16
Finland	5.28	6.16	12.46	6.30
Sweden	9.16	5.88	9.75	3.87
Czech Republic	10.27	5.73	2.67	-3.06
Macedonia	2.04	5.66	1.43	-4.23
Latvia	2.27	5.64	7.07	1.43
Norway	4.72	5.56	5.48	-0.08
Mongolia	2.61	5.53	15.14	9.61
Spain	44.05	5.42	1.61	-3.81
Greece	11.11	5.39	1.62	-3.77
Singapore	4.49	5.34	0.02	-5.32

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Austria	8.31	5.30	3.31	-1.99
Slovenia	2.01	5.30	2.61	-2.69
Saudi Arabia	24.68	5.13	0.84	-4.29
Uruguay	3.34	5.13	9.91	4.78
Germany	82.34	5.08	1.92	-3.16
Switzerland	7.51	5.02	1.24	-3.78
France	61.71	5.01	3.00	-2.01
Italy	59.31	4.99	1.14	-3.85
Oman	2.73	4.99	2.14	-2.85
New Zealand	4.19	4.89	10.77	5.88
United Kingdom	61.13	4.89	1.34	-3.55
South Korea	47.96	4.87	0.33	-4.54
Malaysia	26.56	4.86	2.61	-2.25
Israel	6.93	4.82	0.32	-4.50
Japan	127.40	4.73	0.60	-4.13
Lithuania	3.36	4.67	4.36	-0.31
Kazakhstan	15.41	4.54	4.01	-0.53
Portugal	10.64	4.47	1.25	-3.22
Russia	141.94	4.41	5.75	1.34
Poland	38.13	4.35	2.09	-2.26
Mauritius	1.27	4.26	0.56	-3.70
Bulgaria	7.64	4.07	2.13	-1.94

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Slovakia	5.39	4.06	2.68	-1.38
Turkmenistan	4.98	3.93	3.21	-0.72
Belarus	9.72	3.80	3.29	-0.51
Croatia	4.43	3.75	2.50	-1.25
Nepal	28.29	3.56	0.55	-3.01
Gambia	1.62	3.45	1.10	-2.35
Chile	16.64	3.24	3.83	0.59
Paraguay	6.13	3.19	11.24	8.05
Trinidad and Tobago	1.33	3.09	1.57	-1.52
Libya	6.17	3.05	0.44	-2.61
Mexico	107.49	3.00	1.47	-1.53
Hungary	10.03	2.99	2.23	-0.76
Brazil	190.12	2.91	8.98	6.07
Lebanon	4.16	2.90	0.40	-2.50
Ukraine	46.29	2.90	1.82	-1.08
Venezuela	27.66	2.89	2.81	-0.08
Panama	3.34	2.87	3.15	0.28
Bosnia and Herzegovina	3.78	2.75	1.60	-1.15
Romania	21.45	2.71	1.95	-0.76
Turkey	73.00	2.70	1.32	-1.38
Costa Rica	4.46	2.69	1.90	-0.79
Botswana	1.89	2.68	3.83	1.15

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Iran	72.44	2.68	0.81	-1.87
Mauritania	3.14	2.61	5.50	2.89
Argentina	39.49	2.60	7.50	4.90
Bolivia	9.52	2.57	18.84	16.27
Serbia	9.83	2.39	1.16	-1.23
Guyana	0.76	2.38	62.13	59.75
Thailand	66.98	2.37	1.15	-1.22
Niger	14.14	2.35	2.09	-0.26
South Africa	49.17	2.32	1.14	-1.18
China	1336.55	2.21	0.98	-1.23
Namibia	2.09	2.15	7.56	5.41
Papua New Guinea	6.42	2.14	3.75	1.61
Jordan	5.94	2.05	0.24	-1.81
El Salvador	6.11	2.03	0.67	-1.36
Jamaica	2.70	1.93	0.38	-1.55
Mali	12.41	1.93	2.49	0.56
Albania	3.13	1.91	0.87	-1.04
Honduras	7.17	1.91	1.84	-0.07
Tunisia	10.07	1.90	0.98	-0.92
Ecuador	13.34	1.89	2.33	0.44
Azerbaijan	8.63	1.87	0.76	-1.11
Colombia	44.36	1.87	3.98	2.11

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Cuba	11.20	1.85	0.74	-1.11
Georgia	4.36	1.82	1.21	-0.61
Madagascar	18.60	1.79	3.07	1.28
Myanmar	49.13	1.79	2.04	0.25
Guatemala	13.35	1.77	1.12	-0.65
Armenia	3.07	1.75	0.71	-1.04
Ghana	22.87	1.75	1.19	-0.56
Uzbekistan	26.90	1.74	0.92	-0.82
Chad	10.62	1.73	3.17	1.44
Sudan	40.43	1.73	2.42	0.69
Guinea	9.62	1.67	2.85	1.18
Egypt	80.06	1.66	0.62	-1.04
Algeria	33.86	1.59	0.59	-1.00
Nicaragua	5.60	1.56	2.82	1.26
Peru	28.51	1.54	3.86	2.32
Uganda	30.64	1.53	0.85	-0.68
Syria	20.50	1.52	0.70	-0.82
Swaziland	1.15	1.50	1.00	-0.50
Dominican Republic	9.81	1.47	0.50	-0.97
Nigeria	147.72	1.44	1.12	-0.32
Comoros	0.83	1.42	0.29	-1.13
Somalia	8.73	1.42	1.40	-0.02

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Gabon	1.42	1.41	29.29	27.88
Vietnam	86.11	1.40	0.86	-0.54
Moldova	3.67	1.39	0.66	-0.73
Iraq	29.49	1.35	0.30	-1.05
Burkina Faso	14.72	1.32	1.30	-0.02
Central African Republic	4.26	1.32	8.44	7.12
North Korea	23.73	1.32	0.58	-0.74
Philippines	88.72	1.30	0.62	-0.68
Laos	6.09	1.28	1.58	0.30
Liberia	3.63	1.26	2.47	1.21
Kyrgyzstan	5.35	1.25	1.34	0.09
Zimbabwe	12.45	1.25	0.75	-0.50
Benin	8.39	1.23	0.78	-0.45
Morocco	31.22	1.22	0.61	-0.61
Indonesia	224.67	1.21	1.35	0.14
Sri Lanka	19.88	1.21	0.45	-0.76
Tanzania	41.28	1.18	1.02	-0.16
Cape Verde	0.49	1.17	0.51	-0.66
Kenya	37.76	1.11	0.59	-0.52
Ethiopia	78.65	1.10	0.66	-0.44
Senegal	11.89	1.09	1.20	0.11
Lesotho	2.03	1.07	0.81	-0.26

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Sierra Leone	5.42	1.05	1.20	0.15
Cameroon	18.66	1.04	1.85	0.81
Cambodia	14.32	1.03	0.94	-0.09
Rwanda	9.45	1.02	0.56	-0.46
Côte d'Ivoire	20.12	1.01	1.67	0.66
Angola	17.56	1.00	3.00	2.00
Tajikistan	6.73	1.00	0.56	-0.44
Togo	6.30	0.97	0.60	-0.37
Republic of the Congo	3.55	0.96	13.27	12.31
Guinea-Bissau	1.54	0.96	3.22	2.26
Yemen	22.27	0.94	0.62	-0.32
India	1164.67	0.91	0.51	-0.40
Zambia	12.31	0.91	2.26	1.35
Burundi	7.84	0.90	0.50	-0.40
Eritrea	4.78	0.89	1.60	0.71
Mozambique	21.87	0.77	1.89	1.12
Pakistan	173.18	0.77	0.43	-0.34
Democratic Republic of the Congo	62.52	0.75	2.76	2.01
Palestinian Authority	4.02	0.74	0.16	-0.58
Malawi	14.44	0.73	0.70	-0.03
Haiti	9.72	0.68	0.31	-0.37
Afghanistan	26.29	0.62	0.54	-0.08

Country	Population in millions	Ecological Footprint in gha/pers	Biocapacity in gha/pers	Ecological remainder (if positive) in gha/pers
Bangladesh	157.75	0.62	0.38	-0.24
Timor-Leste	1.06	0.44	1.21	0.77
Puerto Rico	3.95	0.04	0.14	0.10