Detailed background information & suggestions for implementation

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1. What is the Ecological Footprint?

In short, it is an accounting of nature.
The Ecological Footprint was developed in the mid-1990s by Mathis Wackernagel and William Rees. It has since become established and is an indicator of sustainability. It describes the area of forest, pasture land, arable land and sea area on earth that is necessary to provide the energy and raw materials needed to maintain the current lifestyle and standard of living. Thus, the Ecological Footprint records the influence and extent of human activity on the earth's natural resources.

2. How can it be explained?

The demand for food is increasing due to the population explosion. At the same time, people are striving for more capital, a better standard of living and thus economic growth. This in turn leads to accelerated extreme changes on earth by man. The earth's natural resources are being consumed, because raw materials are the basis of the economy and prosperity. Ecosystems are under heavy strain and in many ways exploited as an inexhaustible source. The results are melting polar caps, rising sea levels, rising temperatures, floods, droughts, tsunamis and other natural disasters - in a word, climate change. In order to be able to statistically process and utilise the evidence for this development or for the state that has already occurred, the Ecological Footprint was developed.

The Ecological Footprint can be calculated at all levels, for

- Companies
- Cities
- Countries
- Individuals
- Communities
- selected activities

Unlike the CO_2 footprint, the ecological footprint takes into account other environmental impacts in addition to CO_2 emissions. Since the calculated values are comparable, the Ecological Footprint can be used as an indicator for sustainability. Furthermore, the Ecological Footprint is also an indicator for equity. It is based on the principle of equality, i.e. the basic assumption that all people have the same amount of resources at their disposal. The scientifically quantifiable values show the winners and losers among the countries of the world and illustrate both regional and global environmental responsibility.

3. How can the Ecological Footprint be used?

The Ecological Footprint method has an added educational value. Dealing with this topic sharpens the awareness of the finite nature of areas and of the multitude of impacts and their interactions with each other. It includes topics such as energy and resource consumption, human land use, consumption and sustainability, climate change and globalisation, worldwide justice and personal responsibility.

The Ecological Footprint can be applied in education under three aspects:

1. as an instrument for presenting the actual situation
2. for planning sustainability
3. as an environmental education communication tool

The educational content results from the manifold topics that the Ecological Footprint touches as an indicator:

- Energy and resource consumption
- Consumption and sustainability
- Greenhouse effect and climate change
- Human land use
- Globalization
- Agriculture and forestry
- Population development
- Biodiversity
- Security of supply
- Food Security
- Mobility

The topics show that the Ecological Footprint is an interdisciplinary can be used in:

- Biology
- Geography
- Social Studies
- History
- Economics
- Chemistry
- Physics
- Ethics

4. What does the Ecological Footprint measure and how is it calculated?

The starting point for the calculation is the natural biocapacity the resource supply of the earth. This refers to the area of land that produces biologically useful material for human beings, for example the area on which the cotton for our jeans, the grain for our bread or the feed for farm animals grows. Biologically productive areas are, for example, arable land, pasture land, fishing grounds, forest areas and land areas. The areas that humans need for settlements, roads, industrial plants or airports are also included in the calculation of the Ecological Footprint. In addition, these areas absorb the waste produced by humans. An area can even be calculated for the consumption of energy: it is the area that binds the emitted carbon dioxide, e.g. pasture land or a forest area. All production areas bind carbon emissions.
The Ecological Footprint thus measures the size of the biologically productive area and the land consumption by humans (human consumption).
In order to compare areas with different biological productivity, the "global hectare" (gha) was defined as a valid unit of measurement. A "global hectare" is a hectare (ha or 10,000 square metres) with average global productivity.
The "global hectare" is therefore an average value. It can be used to compare the consumption of natural resources worldwide.

5. Who records and calculates the Ecological Footprint?

Global Footprint Network collects and calculates the necessary data. These are published annually together with the *World Wildlife Fund (WWF)* under the title “Living Planet Report”. The necessary data for the calculation of the Ecological Footprint are provided by, among others, the *UN Comtrade*, the *Food and Agriculture Organization of the United Nations* and the *International Energy Agency IEA*. Further data sources are published in the “Ecological Footprint Atlas".

More detailed information on scientific recording and calculation can be found under the following links:

- https://www.wwf.de/living-planet-report/
- https://comtrade.un.org
- http://www.fao.org/home/en/
- https://www.footprintnetwork.org/resources/data/

6. What is the context between the Ecological Footprint and sustainability?

The Ecological Footprint enables the balancing of supply and demand for natural resources. The ability of nature to produce raw materials and degrade pollutants is called biocapacity. It is also measured in terms of "global hectares". Thus, the Ecological Footprint can be directly compared with biocapacity and reveals whether the people of a country get by with their ecological capital, i.e. whether they manage sustainably or whether they live at the expense of nature and people in other regions of the world.

In this context, the comparison of biocapacity and Ecological Footprint of a person living in Germany serves as an example. The Ecological Footprint in 2019 was 4.8 gha per person, whereas only 1.6 gha was available for biocapacity per person. The difference between biological capacity and the Ecological Footprint determines whether a region or country has an ecological deficit or ecological reserves. For Germany, the difference is: 1.6 - 4.8 = - 3.2 The difference of - 3.2 shows that the inhabitants of Germany overuse nature and use many more natural resources than they are fairly entitled to - in summary: people in Germany live on too large a footprint. If Germany wants to make do with a sustainable and fair share of the available biocapacity, Germans will have to reduce their footprint by an average of about 67%. The area index creates an understanding of the relationship between resource consumption and available bioproductive area. It illustrates where injustices occur worldwide and how far away people are from a sustainable lifestyle.

Sources to background information:

- https://www.footprintnetwork.org/our-work/ecological-footprint
- https://www.multivision.info
- https://www.br.de/nachrichten/wissen/wwf-report-menschen-ruinieren-umwelt-und-artenvielfalt,R7s2eGV
- https://www.welt.de/vermischtes/article160309003/Ein-oekologischer-Fussabdruck-in-Uebergroesse
- https://www.bpb.de/nachschlagen/zahlen-und-fakten/globalisierung/255298/oekologischer-fussabdruck-und-biokapazitaet

7. Where can I find information on comparable Ecological Footprint values worldwide?

The concept of the Ecological Footprint calculates the human demand for natural resources and compares it with the capacity of the earth. The personally determined footprints vary widely and offer cause for discussion and critical examination.
A comparison of the personal value with the Ecological Footprints of the own country or the entire world population clearly illustrates the importance of the Ecological Footprint as an indicator for sustainability.
Since 1971, the world population consumes more natural resources in one year than the earth can regenerate in one year. The global Ecological Footprint shows that an ongoing overexploitation of natural resources is taking place. On average, every human being consumes about 3.3 global hectares (gha) per year. To compensate for their standard of living and consumption patterns, the world's population would currently need an average of 1.75 earths (as of July 29, 2019, Global Footprint Network).
A country comparison shows the resource consumption of the world population even more clearly. If the world population were to live according to the standard of living in the USA, a total of 5 earths would be needed to cover the immense demand for energy, raw materials and land. Germany's population is currently living beyond its means and now needs 3 earths.
The global consumption of the earth's natural resources is increasing every year and exceeds the regenerative capacity of the biosphere. This is known as ecological overshoot. Every year the "Earth Overshoot Day" is determined. On this day, the world's population has used up all the natural resources that the earth can regenerate and make available in a sustainable manner within one year. This "Earth Overshoot Day" shifts further forward every year. For the year 2019 the 29th of July has been determined. For the rest of the year, the world population lived "on credit".
In this context, a global comparison of the Ecological Footprints of individual countries is useful. Statistics show the great differences between the countries of the Global North and the Global South and encourage critical discussion.

To print

The working materials for download include worksheets with country examples and a suggestion for classifying one's own footprint in a global comparison. These can be found in the file "Global comparisons and further work". The file contains:

- Global comparison
- Per person footprint
- National footprint

8. List of digital country comparisons and per person values of the Ecological Footprint

- http://data.footprintnetwork.org/#/
- https://de.statista.com
- https://www.bpb.de/nachschlagen/zahlen-und-fakten/
- An interactive map: http://data.footprintnetwork.org/?_ga=2.186668392.179556901.1593521543-129397019.1591370396#/

9. What is meant by the "Global North" and the "Global South"?

The two terms Global North and Global South are less/non-judgmental terms that replace the old terms industrialized countries/developing countries or first world/third world. North and South are therefore not to be understood geographically. Nor does the term global denote geographical location. It refers to the global perspective, which takes into account causes, effects and interrelationships. In the global system, countries are compared in their economic, political and social positions.
The countries that are disadvantaged in these positions are grouped together to form the **Global South**.
The **Global North** comprises the countries that have advantages and whose position is therefore considered privileged.
The division into countries of the Global South and the Global North thus refers to the different experiences of these countries with regard to colonialism - on the one hand the country as an occupier with economic, military and power-political benefits for the other country and on the other hand the politically oppressed, economically exploited and dependent country.