

## The Ecological Footprint

### SPACESHIP EARTH

The Earth has only a limited amount of vital supplies available for humanity. You can compare it to a spaceship:

- there must be **SUFFICIENT** vital **SUPPLIES** on it for all people (for the crew)
- to know how much supplies we have, we need **BOOKKEEPING** of the available supplies
- the supplies should be shared fairly among all crew members, therefore we need **RULES** and **FAIRNESS** for the equal division of resources on Spaceship Earth



Background information:

[https://en.wikipedia.org/wiki/Spaceship\\_Earth](https://en.wikipedia.org/wiki/Spaceship_Earth)

kniffelix.rz.tu-harburg.de

### EARTH OVERSHOOT DAY

**Overshoot** = overexploitation: renewable resources are consumed faster than they can regrow or renew themselves



wood



fish



water



Humus

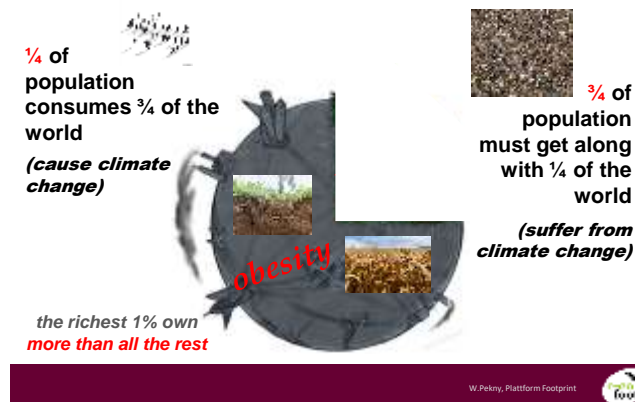
This is not sustainable!

Humanity uses nature's resources ignoring the limits. We catch more fish and cut more wood, use more water, than the amount which could be regenerated and release more CO<sub>2</sub> into the atmosphere, than can be captured again. This leads to ecological overshoot. Every year since the 1970s, the **Earth Overshoot Day** is announced before December 31<sup>st</sup> – it is currently taking place at the end of July. This means that from August we are consuming the supplies of future generations and overusing nature. This day is constantly taking place earlier each year.

Background information: [www.overshootday.org](http://www.overshootday.org)

### WORLD OUT OF BALANCE

#### Fair World?



- One quarter of the world's population consumes ¾ of the resources and causes climate change - most of them live in the Global North (Europe, North America, Japan, ...)
- The poorer ¾ of the world's population and the remained wildlife only use ¼ of Earth's resources and suffer from the consequences of climate change – most of them live in the poorest countries of the South.
- The richest 1% of humanity owns more of the wealth on Earth than 99%!
- Women do 60% of work, worldwide, and own less than 2% of the wealth!

### THE ECOLOGICAL FOOTPRINT

is a measure of environmental consumption. It measures how much area (land) we need for:

Which areas do we need?



- growing the **plants** we eat
- growing grain and grass to feed the cattle, pigs and chickens that become the **meat** we eat
- growing cotton and wool for the **clothes**
- forests used for the wood for **furniture and paper**
- forests **to bind** CO<sub>2</sub> produced by the combustion of fossil fuels (oil, coal and natural gas). Otherwise the atmosphere warms up, what we don't want.

The measurement unit of the Ecological Footprint is the **global hectare gha** or global square meter gm<sup>2</sup> of the average biological productivity in one year.

## CLIMATE CHANGE

The natural greenhouse effect (generated by the normal amount of greenhouse gases like CO<sub>2</sub> in the atmosphere) brings the average temperature on Earth to about + 14 °C. The increase of these gases in a short time causes **global warming** and has dangerous consequences for humanity. The combustion of fossil fuels (oil, natural gas and coal) produces CO<sub>2</sub> – one of the most important contributors to climate change. 90 % of the fossil fuels are burned, the rest is used for paints, clothing, asphalt, medicines or plastics (only 4% of fossil fuels are used for plastic).

Trees and other plants recapture CO<sub>2</sub> from the atmosphere. Through photosynthesis, they convert it into plant parts and wood. There is not enough surface on Earth to plant forests to recapture all the CO<sub>2</sub> emissions produced by humans from the atmosphere. Therefore it is vital that we **reduce our greenhouse gas emissions** and save our forests and regrow them.

## FOOTPRINT ACCOUNTING:

What does it measure?

– **Area for human consumption**  
How much is used?

This is contrasted with:

+ **Area**  
How much is available?  
**biologically productive areas**

It's an accounting for nature.

The Ecological Footprint measures the areas used for our consumption. These are contrasted with the available productive area on earth. The result is ecological overshoot. The Global Footprint Network calculated that only 1/4 of the world's surface is biologically productive: around 13 billion hectares. When we divide this area through the

21% biologically productive land 4% biologically productive ocean



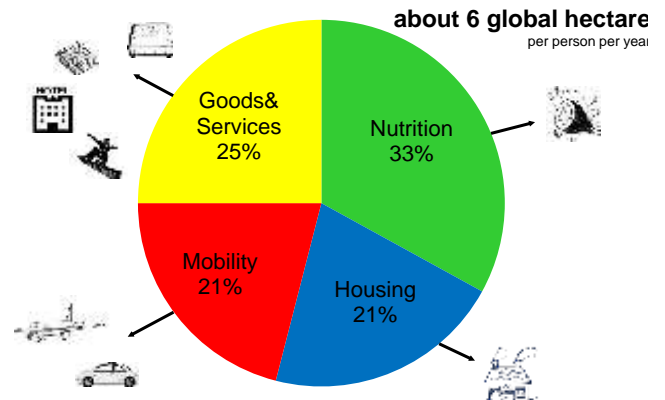
number of people living on Earth, we get the **FAIR SHARE** of **1.6 global hectare\*** (gha) for each Earth citizen.

An average European consumes approx. 3 times more than this fair share: 5 global hectares per year; an Austrian consumes on average about 6 gha, a US citizen about 8.1 gha, a Chinese 3.6 gha, an Indian 1.2 gha.

*Background information:* [www.overshootday.org/kids-and-teachers-corner/classroom-activities/](http://www.overshootday.org/kids-and-teachers-corner/classroom-activities/)

## AVERAGE FOOTPRINT OF AN AUSTRIAN

- one third of the total Footprint is due to food consumption (2 gha – more than the fair share!)
- 21% is due to housing (mostly heating and electricity)
- 21% is due to mobility (mostly for driving and flying)
- 25% is due to other consumption (everything else we buy - the largest share has paper, holidays, furniture, sports equipment and pets).



## FOOTPRINT OF ROLL, HAM AND HAMBURGER

The Ecological Footprint of a roll is around 0.3 global m<sup>2</sup>. 5 slices of pork ham in the roll have a Footprint of 1.5 global m<sup>2</sup>, five times more than the roll. If the meat is beef, it needs an area as big as a king size double bed (3.6 gm<sup>2</sup>)! Hamburgers mostly contain beef. Meat and animal products have a big Footprint!

## THE FIVE FOOTPRINT RULES

Enjoy a sustainable lifestyle and the good feeling of not living at the expense of others! Enjoy more time, more friends, more joy, knowledge, wisdom...

### The 5 most important things YOU can do!

**E**njoy life with a smaller Footprint: more friends, family, time, fun.

**A**ct together to create a sustainable world that supports living on a small Footprint!

**R**educe meat and animal products! Prefer local and seasonal products, as much as possible from organic farming.

**T**ravel with a small Footprint – by train, bike and bus. Don't fly! Ride cars less, never alone, with green electricity!

**H**ome green home! with green energy, well insulated, smaller, access to public transport

\* Footprint data calculated by Global Footprint Network. Footprint data refer to the year 2016 in the calendar year 2019 and therefore the world's population for the year 2016 (7.5 billion) is needed for the calculation of the fair share.



Co-funded by the  
Erasmus+ Programme  
of the European Union