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Climate change on your plate

Summary

Our food consumption gives rise to considerable greenhouse gas (GHG) emissions as our food must first be produced, then harvested, transported, stored, and possibly processed before it finally ends up on the retailers' shelves. Once it has reached the consumer's household it is further stored, often refrigerated, then processed and eaten – or it may end up in the waste bin, in which case it will need to be managed as part of the waste stream. The emissions caused along this chain are called “direct” emissions. In addition there are so-called “indirect” emissions which are often overlooked in the public discussion but which may significantly increase our personal “carbon footprint”. These greenhouse gas emissions result from land use changes, for example the conversion of grassland into arable land or tropical rainforest into pasture. But how is our daily food consumption linked to land use change in our own country or elsewhere in the world? Where does land use change occur and which foods have a particularly strong impact in this regard? Are our decisions as to what to eat and how much to eat of relevant to our climate or to land use change in Brazil? Can a healthy diet be considered a contribution to climate protection? And what is the climate impact of our current wasteful way of dealing with food?

“Meat eats Land” and “Tons for the Bin”, the two preceding studies as part of a long-term WWF project, describe the linkages between our food consumption – and in particular our high meat consumption – and land consumption. They come to the conclusion that the land footprint of our strongly meat-based diet is very large indeed. But the studies also show that a healthier diet and a more prudent attitude to dealing with food can substantially reduce our land footprint. This third study now considers the climate impact of the way we eat.

Almost 70 % of the direct greenhouse gas emissions caused by our food consumption can be attributed to livestock products while plant-based products only account for about a third of these emissions. Our appetite for meat is therefore not only responsible for increased “land consumption” but also produces considerably more greenhouse gases.

Slight increase in German food consumption results in conversion of 200,000 ha of land

Dietary changes do not only impact on land consumption but also on the quantities of GHG emissions. The following example explains why: Compared to 2009, the average German in 2010 consumed slightly more wheat products (2010: 66.4 kg, 2009: 62.8 kg) and poultrymeat (2010: 19.3 kg, 2009: 18.8 kg). The annual average per capita food consumption increased from 667 kg (2009) to 677 kg (2010). This increase may seem very minor but it significantly increased Germany's need for agricultural land for food production, i.e. by 215,000 ha. As Germany does not have the capacity to increase its domestic agricultural area, the additional land needed must be drawn on in other countries. The 215,000 ha in question are almost equivalent to the territory of the federal state of Saarland. Of this additional acreage, 37,000 ha are located in South America where the associated land use change gives rise to approximately 5.6 million tons of CO₂ emissions. The overall quantity of additional indirect GHG emissions resulting from this relatively small change in our eating habits amounts to 40 million tons, which considerably increases the German food carbon footprint, i.e. from 163 to 203 million tons CO₂-equivalents. The per capita food carbon footprint thus increased from 2 to about 2.5 tons CO₂-equivalents. In other words, roughly 20 % of our current food carbon footprint is caused by recent changes in food consumption and the associated land use change.

Healthier diet would equate to saving 230 billion kilometres of passenger car journeys

Those in Germany who eat a healthier diet actively contribute to climate protection. The sizes of our land and carbon footprints are strongly correlated with our meat consumption and the associated use of soya in livestock production. A healthier diet based on scientific recommendations would have a correspondingly positive impact on resource and climate protection: It would free up more than 1.8 million hectares worldwide for other uses. This is an area the size of the federal state of Saxony. Moreover, it could avoid the release of greenhouse gas emissions in the order of 27 million tons CO₂-equivalents: 13 million tons of savings in direct greenhouse gas emissions and 14 million tons by avoiding land use change. This figure is equivalent to the emissions caused by 2.3 million new cars, based on a European emission standard for passenger cars of 120 g CO₂/km and a total mileage of 100.000 km.

Climate protection benefits from prudent use of food

The German's inconsiderate attitude to food also has an immediate impact on the climate, as the amount of edible food discarded each year required 2.4 million ha of cropland to be produced. This is an area the size of the federal state of Mecklenburg-Western Pomerania which could be devoted to other uses or not be utilized at all. Land use change on an area this size causes approximately 21.5 million tons CO₂-equivalents of indirect greenhouse gas emissions. Additionally there are 18.7 million tons CO₂-equivalents in direct emissions which would be avoided as considerably less food would need to be produced. Total emissions savings would thus be in the order of 40 million tons CO₂-equivalents, which is comparable to the total greenhouse gas emissions of Slovenia or Israel. If we consumed our food in time, rather than letting it go off, we would actively pursue climate protection and safeguard land resources.

Conclusion

If German consumers could be convinced to include less meat in their diet and to discard less edible food, more than 4 million ha of arable land and grassland in Germany and abroad could be freed up for other types of land use. Such behavioural changes would result in greenhouse gas emissions savings in the order of up to 67 million tons CO₂-equivalents. This amount of savings equates to the entire emissions output of Austria or a fleet of 5.5 million new cars each driving 100000 km.

At an individual level, such behavioural changes would result in every person in Germany contributing annual greenhouse gas emissions savings in the order of 800 kg CO₂-equivalents or 7 % of their overall emissions.

Tanja Dräger de Teran, WWF

Contact:

Tanja Dräger de Teran
Program Officer Sustainable Land Use, Climate Protection and Food
WWF Deutschland
Reinhardtstrasse 14
10117 Berlin
Direkt: +49 (30) 311 777 242
tanja.draeger-deteran@wwf.de