

THE GREAT MULTIPLIER

In the first paragraph of the Call for Papers for this conference there was a remarkable statement. It reads as follows:

“Population size nevertheless matters less for human impacts on the climate and other earth systems as compared to affluence and consumption, which vary widely across the planet.”

I’d like you to scrutinise this statement. The first part poses that population size matters less for human impacts on the climate and other earth systems than affluence and consumption. This may be so, but without people there is no affluence and consumption. Population growth leads to increased economic activity, and as more and more people escape from poverty, they will consume more.

In the well-known IPAT-equation P (population) is one of the factors determining the human impact on the environment. If we define A (affluence) as the GDP (Gross Domestic Product) per capita, the number of P or population size is a strong multiplying factor, as more people normally leads to more economic activity.

The second part of the statement asserts that affluence and consumption vary widely across the planet. That’s undeniably true. The number of relatively poor people on this planet is much larger than the number of wealthier people. The happy few can be especially found in Northern America, Western Europe, Australia, and in countries such as Japan, Southern Korea and Saudi Arabia, all countries of which the GDP per capita exceeds 30K dollars.

Approximately the number of well-to-do people will hardly exceed 500 million or half a billion. Let’s consider all the others as the poorer people of the world.

Their number will add to 7 billion. No one of them will be willing to stay poor. People traveling by bike, would like to have a moped, those with a moped would like to have a car, a refrigerator, a television set or even air conditioning.

Now let's assume that the richer part of the world would consume less in order to make consumption growth elsewhere possible without further burdening the earth. Let the richest half billion world citizens halve their consumption from let's say 100 units to 50 units and let the other 7 billion double their consumption from let's say 10 units to 20 units in 2050, as their number has increased to 9 billion people. Then total consumption would increase from $\frac{1}{2} \times 100 + 7 \times 10 = 120$ billion units to $\frac{1}{2} \times 50 + 9 \times 20 = 205$ billion units. This simple calculation shows that consumption and population numbers are no separated issues. Both have impact on the earth's resources. Consuming less in rich countries isn't much effective on a world scale. A fairer distribution as illustrated by the calculation would lead to 70% increase of consumption in an already overburdened world.

Of course, this is merely a thought experiment and the values chosen may vary in reality. Nevertheless, it shows that a reduction of consumption and pollution can be achieved most effectively by reducing the number of consumers. As long as emerging countries such as China and India are working towards the consumption pattern of rich countries this will exacerbate the global situation. Population reduction is the best remedy against over-depletion and pollution. In a nutshell: the less people living here as we do, the better. And also: the less people living elsewhere as we do, the better too.

It would be naïve to suppose that there is support in the developed world for cutting our consumption in half. Even self-identified environmentalists don't want to do this. It is also naïve to suppose that poor people in the world are willing to stay poor for the sake of the climate or the planet. Nevertheless, it would be a good question if a modest life style for everybody on earth could solve the present overshoot problem.

Let's investigate if science has an answer to this question. It is well known that present day humanity exceeds the carrying capacity of planet Earth. To date,

the world population overuses its renewable natural resources with a factor 1.7. But is it our number or our behaviour that causes this overshoot? Should we reduce our population size or diminish our consumption? Or both?

New [research](#) has given an answer to this question. Given the universal right of a person to a standard of living adequate for the health and well-being of himself and of his family, such a standard must be set. The researchers used the [Human Development Index \(HDI\)](#) of the United Nations to find a possible standard.

The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development.

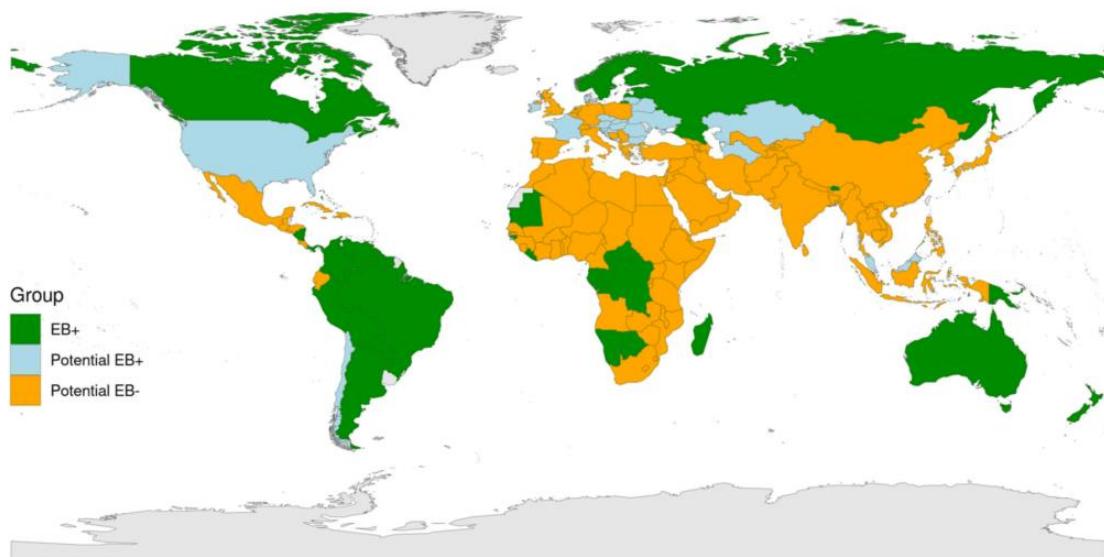
The *health dimension* is assessed by life expectancy at birth, the *education dimension* is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The *standard of living dimension* is measured by gross national income per capita. The scores for the three HDI dimension indices are then aggregated into a composite index ranging from 1 to 0. It is important to note that the HDI is a measure of general welfare and not just an index of material prosperity.

The HDI is calculated for 189 countries in the world. Norway has the highest HDI (0.957), Niger the lowest (0.349). Tamburino and Bravo took a HDI of 0.7 as a minimum level of welfare. Almost two third of all countries have a higher HDI, one third a lower index. Near the cut-off score of 0.7 we find countries such as Egypt, Indonesia and Vietnam. An HDI of 0.7 can be seen as quite a modest standard of living, at least in our Western eyes.

In order to make this HDI possible for everybody, the average person must be allowed a specific ecological footprint. The correlated footprint is 2.14 global hectare per person. A global hectare is defined as the average yield of one hectare biologically active surface of the earth. This can be cropland, grazing land, forests or fishing ground. Inhabitants of rich countries consume much more than this 2.14 gha, e.g. the Austrians consume 6.1, almost 3 times more. An important component of the actual footprint of developed countries is the carbon footprint. Their emission of greenhouse gases require a lot of biocapacity to be sequestered.

Countries above the maximum per capita footprint of 2.14 gha should try to make this footprint smaller by consumption reduction, use of green energy and new technologies in order to enable other countries to have a footprint in compliance with the set standard of living.

However, the bad news is that even in a world where it is possible for everybody to have an adequate standard of living, the actual population would still exceed the carrying capacity of the planet. There are countries that could offer their inhabitants an adequate HDI with the associated footprint without an ecological overshoot, such as Canada, almost all countries in South-America, Scandinavia, Russia and Australia but also Congo, Namibia and Madagascar. These are the green regions on the map.



They have an EB+, a positive ecobalance. Then there are countries that could achieve an HDI of 0.7 within their ecological boundaries by changing their per capita footprint. Examples are the USA, France, Ireland and Austria. These are the light blue regions on the map. They have a Potential EB+, a potential positive ecobalance.

A third category of countries however will not be able to do this. Even if they would adjust to an HDI of 0.7 and the associated footprint, they still would exceed their ecological boundaries with their present population. Examples are: most countries in Africa, the entire Middle-East, Pakistan, India, China and

the Caribbean. But also the UK, Spain, The Netherlands, Belgium, Germany, Poland, Switzerland, Italy and Greece. These are the orange regions on the map. They have a Potential EB minus, a negative ecobalance. Even if these countries would try to return to their ecological boundaries by reducing their per capita footprints to the size associated with the set HDI, they would still accommodate too many people to achieve that goal. Eventually there are two complementary possibilities to create ecological balance in these countries: either a strong reduction of production, consumption and pollution or a substantial population decline.

What can we do to restore the ecobalance in different countries? First of all, we should try to reach an international agreement (supported by the UN) requiring each sovereign nation – that's where the power is - to eliminate its ecological deficit, making its own trade-off between consumption and population size. No country would be permitted to "live beyond its means" by emigration or by exporting pollution. It is likely that, faced with a choice between population reduction or dramatic reductions in consumption, (or other constraints), most people would choose the former. Each nation could choose its favoured method of achieving sustainability.

Secondly, we should acknowledge and accept that countries with a high GDP and a high per capita footprint as well as a high ecological overshoot are not fit for immigration if they want to restore their ecological balance. More people and more labour force will aggravate the environmental impact of these countries (GHG, nitrogen oxides, particulate matter emissions, resource depletion, fresh water consumption, soil degradation, living at the costs of other countries by huge imports of resources). Immigrants will take over the way of living in these countries and reinforce economic growth whereas economic degrowth is required in order to achieve sustainability.

Thirdly, given our addiction to fossil fuels – think of the Ukrainian War - and the worldwide inability to reduce carbon emissions it might be better to go for adaptation to the consequences of climate change instead of investing in prevention and mitigation. Until now, energy transition and GHG reductions haven't been very effective in developed countries. I personally believe that

this "transition" is mainly industry driven and that it functions as a neoliberal revenue model with numerous drawbacks (use of fossil fuels and resources to produce new e-cars, wind turbines, solar panels, dependency on rare earth metals, necessity to reinforce the grid) without any significant progress. What works, is economic degrowth, as can be concluded from the COVID-19 pandemic (World Overshoot Day postponed with a month). With billions of people striving for more wealth and only half a billion people in richer countries nor really willing to consume less, the whole IPCC circus turns out to be a fake.

To give an example: on the map is the worst case scenario for my country in the next century as a consequence of sea level rising. It will be impossible to save large parts of The Netherlands lying below or slightly above sea level. Arable land will salinize, rivers won't be able to drain down to the sea. It might be wise for The Netherlands to start negotiations with the Federal Republic of Germany in order to become the seventeenth federal state, thus creating a broader hinterland for our inhabitants.

