The Ecological Footprint Nowadays

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Abstract

This assessment refers to the ecological footprint which is a way to measure the impacts of human activities on Earth. It basically calculates the demand and consumption that measures the needs of a society, as well as the waste and greenhouse gases that generates daily in productive sea and fertile land areas. Moreover, it measures all the natural resources needed to support the material needs of a population or person through the technology, lifestyle and habits of each country. Subsequently we are going to examine the advantages and disadvantages of the phenomenon that human activities provoke and the ways to eliminate the caused problem. The world-average ecological footprint in 2013 was 2.8 global hectares per person and the average per country ranges from over 10 to under 1 global hectares per person. There is also a high variation within countries, based on individual lifestyle and economic possibilities that we also examine. Summarizing all those effects we are going to analyze open international data as far as the metabolism of the ecological footprint concerns in our word but especially in our country to form prospects for our planet the principles of life cycle assessments with the aid of statistics and charts.

Keywords

ecological footprint; natural resources; global climate change; planet

Body text

Definition: Ecological footprint is a way to measure the effects of human activities on Earth. It is the measure of demand and consumption that measures the needs of a society, as well as the waste and greenhouse gases it generates daily in productive sea and land areas. It also assesses all the natural resources needed to support the material needs of a population or person through the technology, lifestyle and habits of each country. Unit of measurement of ecological footprint is 1 hectare, which equals 10 acres or 10,000 square meters respectively.

In order to be easily measurable and comprehensible, the "ecological footprint" is based on a model that "converts" the various consumer needs into an area of productive land, such as agricultural land, forest (for wood and for carbon capture) , pastures, eroded or structured land needed to meet these needs.

If we divide the available surface of the planet by the current world population, it is estimated that each of us "corresponds" to about 2 hectares of the planet, of which only 1.7 is available for human use. In view of the demographic changes (population growth with a fixed Earth surface), in 50 years the per capita "available" land surface

will not exceed one hectare. The size of the "ecological footprint" varies from country to country and depends on lifestyle and consumption. The ecological footprint of a European average covers 4.97 hectares. If all the inhabitants of the planet were living and eating like the Europeans, we would need about three planets.

Advantages

Many advantages are presented with the use of ecological footprint as a viability indicator, since many other equally developed methods have been developed to study human ecological problems.

Easy way to understand the human impact on the environment

It is a useful tool with which we are given a measure of the effects of overexploitation of natural resources on the planet, very useful for informing the world between the natural environment and the economic activity of man. The ecological footprint is effective in disseminating to the world the idea that each of us has contributed to the situation that has come to earth today through its choices in the consumption of material goods.

Disadvantages

The ecological footprint has received a great deal of negative criticism, such as the fact that it does not exactly express its consumption and its impact, it does not accurately calculate the responsibilities, but also that it is not a very useful and trusted tool in political decision making. All critics of the ecological footprint model agree with the following:

1. Insufficient explanation of the demands of a population on productive land

The ecological footprint reveals the requirements of a population in biologically productive territory but does not provide the necessary explanation for the causes that lead to them. Choices relating to consumption habits and production methods of this type have an impact on the use of land resources, but the ecological footprint does not provide an accurate picture of their interactions. Thus, only after a proper data processing can it be used as a decision-making tool.

2. Lack of data for political decision-making

The use of ecological footprint in decision-making by national governments and various local bodies does not contain enough data to achieve such objectives. Finding and acquiring data on the consumption of natural resources is becoming more and more difficult, the smaller the studied areas and populations. For this reason, these data are accurately available usually at national rather than at local level.

3. Comparability of results

There are no exact results, as there are many differences in their comparison. Furthermore, a calculation procedure commonly accepted for regions smaller than a national level is not yet feasible. Various ecological footprint activities that have to do with some terrain have been carried out using dissimilar data and methods and have resulted in results where direct comparison cannot be made.

4. Devaluation and revaluation of results

The results of the ecological footprint often overstate the available biological capacity of the soil and underestimate the demands of people on natural resources. This is done by choosing the most optimistic estimates for the productive bioavailable terrain in case of doubt, excluding calculations of the activities of people with insufficient data, and excluding activities that lead to systematic destruction of the wearer capacity of the Earth's natural resources and are quite difficult to measure on the required ground surface.

5. Autarchy of nations in the environmental overexploitation assessment

Assessing the over-exploitation of the environment by using a nation's ecological footprint and comparing it with its available territory has raised several concerns. Many speak of a form of "authoritarianism" created through this approach where all nations are required to use only as much environmental capacity as is contained at their local level. [1]

Ways of reduction

1. Maintaining and increasing the biological capacity of the soil

It is necessary to protect the land from degradation and erosion, as well as the maintenance of land for cultivation and not for urban sprawl. Also, wetlands must be protected for drinking water, but also all kinds of ecosystems (marine, forestry, etc.). Another necessary measure is the abolition of the use of chemical and toxic substances due to the destruction environment.

2. Better control of the use of natural resources

Over the last 40 years with the development of technology, the demands for the use of natural resources to produce goods have increased. The average of each person on the ecological footprint has remained relatively stable but continues to grow at a rapid pace

3. Reduction of consumption of goods by the average person

The reduction in consumption of goods by citizens is mainly due to their financial situation. People living on the brink of poverty can increase their consumption to improve their daily lives, while wealthy people can reduce their ecological footprint without making their lives worse by lowering their consumption of their goods a small percentage.

4. Reducing the world population

Population growth can be gradually reduced and, in the future, reversed by taking measures to make families prefer fewer children.

The Future of the Planet

The current status of global over-consumption of natural resources deems it necessary to reduce the ecological footprint, thus avoiding the exhaustion and complete destruction of ecosystems at a global level. Thus, it is necessary to impose certain measures to reduce the unexpected use of resources and to allocate it to all nations according to their consumption. In particular, the economically developed countries of the world must proceed with the logic of "Shrinking and Sharing" of ecological footprint with the goal of sustainability of future Earth generations. Many studies on a global scale reveal that access to satisfactory food will be achieved with great difficulty in a few decades. In 2050 the Earth may have 9.5 billion people, all of whom will have to feed.

* Shrinking refers to the reduction of ecological footprint worldwide in order not to exceed the consumption of natural renewable resources on earth the regeneration capacity of the world's ecosystems.

* By "sharing" we mean how the productive biological capacity of the planet will be distributed to all nations, citizens, other species on the planet and the various places and regions in a fair way. [6]

GLOBAL ECOFLAMMER MEASURING TABLE [3]

AREAS	POPULATION	BIOCAPACITY	ECOLOGICAL FOOTPRINT	BIOCAPACITY PER PERSON	ECOLOGICAL SURPLUS / REDUCTION PER PERSON	TOTAL
WORLD	6.739,6	12.130,00	2,7			
ARGENTINA	39,7	281,87	2,7			
AUSTRALIA	21,5	313,90	6,7			
AUSTRIA	8,3	27,40	5,3			
BOLIVIA	9,6	176,64	2,6			
BRAZIL	191,5	1.838,40	2,9			
CANADA	33,3	496,17	6,4			
DENMARK	5,5	26,40	8,3	4,8	-3,5	45,65
FINLAND	5,3	64,66	6,2			

IRELAND	4,4	14,96	6,2			
MONGOLIA	2,7	41,31	5,5			
NEW ZEALAND	4,3	43,86	4,3	10,2	5,9	18,49
RUSSIA	143,2	945,12	4,4			
SWEDEN	9,2	87,40	5,7			
USA	305	1.189,50	7,2			

Taking into consideration the above table, we note that Denmark with 5.5 million people has a footprint reduction of 3.5 per person, meaning that by continuing to reduce the pressure exerted by its inhabitants on the planet, while New Zealand , the ecological footprint per person rises by 5.9 with just 4.3 million inhabitants, we will need 3 planets to meet the needs.

MEASUREMENTS PER COUNTRY AND COMPARISON BETWEEN THEM [2]

In particular, Athens occupies the second place in the Mediterranean in terms of its ecological footprint and is only behind the capital of Malta. It even surpasses other cities in Mediterranean Europe, such as Rome, Barcelona or Marseilles. Thessaloniki is ranked 7th in the same list.

In particular, the footprint of Athens is 4.89 hectares per capita, while in Thessaloniki, 4.17 global hectares per inhabitant. The results have many readings: Firstly, it is noted that the sustainable ecological footprint for our planet is 1.7 hectares per capita. The footprint of our cities, however, shows that we consume more natural resources than the planet can offer us, which means that we are experiencing the rapid degradation and exhaustion of the environment that feeds us and gives us life.

Moreover, as you can see in the above figure, the high footprint of Athens and Thessaloniki is mainly due to nutrition and travel. We import most foods and choose meat and fat-rich diets, which adds much to the environment in relation to Mediterranean diet and limited consumption of animal products. At the same time, we choose to drive in the city by car, making it difficult not only globally (with the release of greenhouse gases) but also locally (high levels of air pollution).

Another thing to note is that in relation to the ecological footprint of the whole country, Athens' ecological footprint is almost 10% larger, while the footprint of Thessaloniki is 2-3% less.

In other words, the over-concentration of activities in the capital is still hurting.

According to the 2006 Worldwide World Environment Organization report, at a global level, people consumed about 22-23% more in 2006 than Earth's annual production capacity. That is, the planet needs about a year and three months to reproduce / replenish that we humans used that year.

According to the 2008 report (WWF's "Living Planet 2008") this increased. Humanity consumed about 30% more resources than the planet could replenish each year (~ 27 acres per inhabitant instead of ~ 21 acres per inhabitant). Until 1960, we consumed 70% of the planet's resources, in 1980 it was 100%, in 1999 we reached 120%, in 2008 to 130% and at the rates we had until 2008 - because of the crisis we have some reduction in the forecast was that in 2030 we would reach 200% (we will need two planets like the Earth). In any case, we are living at the expense of the future and of the next generations - we are creating beyond financial debts and ecological debts.

There is, of course, a lot of injustice in relation to the distribution of ecological footprint for people in different regions of the Earth, depending on the standard of living and the way of life. The average North American is needed, for example. 96 acres, the average Canadian 72 acres, the English 56, the French 53, the average Indian 8 acres, etc. According to the European Environment Agency, Europe's ecological footprint, for example, has surpassed its biological capacity since the 1960s. Today it is twice as high as that. And this means that Europeans - as indeed the Americans are even more at the expense of other populations, especially Africa - are incompatible with the equitable allocation of resources.

The "Living Planet 2008" report, which we mentioned earlier, for Greece, provides the following data (Environmental Observatory). We had the 11th largest per capita footprint in the world, the 4th largest in the EU, with 59 equivalents per acre.

·Consumed 181% above the viability limit (21 equivalent acres per person).

·We had the second largest per capita footprint in the world.

·In the period 1961-2005, we had the largest increase in per capita footprint in the EU-27, an increase of 158%.

This is mainly due to our large "energy footprint", meaning our growing energy needs (annual growth of 2.4% between 1990-2004 - much higher than the European average) and our very large "water footprint" which is due to the increased use of water for agriculture (87%), to the losses of the country's obsolete irrigation and water supply network and to the overall mismanagement of water resources. Almost three planets need the Greeks to maintain our pre-2008 lifestyle. We have far exceeded our ecological limit. This is mainly due to our distorted mindset that confronts the natural environment as an inexhaustible resource. We do not yet have any evidence of what is happening after 2008, since the fiscal crisis in the country and the drastic decline in GDP have led to a process of violent "downsizing" and shrinking of the mediums, which was also the huge player of consumerism in previous years the environment. [11]

Conclusions

Taking everything into consideration the ecological footprint of any specified population is defined as the total area of productive land and water required on a continuous basis to produce all the resources consumed, and to assimilate all the wastes produced by that population, wherever on Earth that land is located. Sample

data show that as a result of enormous increases in per capita energy and material consumption, and growing dependencies on trade, the ecological locations of cities no longer coincide with their locations on the map. This finding indicates that no city or urban region can be sustainable on its own. However, it is noted that a prerequisite for sustainable cities is sustainability of the global hinterland. In closing such sustainability gap, the cities present both unique problems and opportunities, suggesting a much-improved accounting for the hidden ecological costs of urbanization and a redefinition of economic efficiency. Meanwhile, many of the environmental demands and impacts that can be traced to cities have nothing to do with the structure, form, or other inherent properties of cities. Rather, they reflect societal and individual values and behavior. Hence, a major shift in values and consumption habits will be essential if human footprints are not to destroy the Earth's carrying capacity.

Simply our goal from now on should be to engage, inspire and empower university students so they can productively embrace the biophysical core tenants of the sustainability conundrum.

References

[1]: Wikipedia/ecological footprint

[2]: blogspot / ecological footprint

[3]: comap /undergraduate/projects/biomath/PDF/Footprint

[4]: carbonfootprintofnations/ ecological footprint

[5]: cres/energy_saving/ecological footprint

[6]: europa.eu/energy/energy- instructions/ecological footprint

[7]: WWF/ Global Footprint Network/ Zoological Society of London (2006) Living Planet Report 2006.

[8]: energybox/ ecological footprint

[9]:safeclimate.net/business/measuring/tools

[10]: J.C.J.M. van den Bergh; H. Verbruggen (1999). "Spatial sustainability, trade and indicators: an evaluation of the 'ecological footprint'"

[11]: nature/ ecological footprint/ Resource footprints and their ecosystem consequences/ Francesca Verones, Daniel Moran, Richard Wood (2018)