

## The Fundamentals of Ecological Footprint

Name

Institutional Affiliation

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### **Emergence of Sustainable Development**

Any debate on present day environmental issues has to begin with the Industrial Revolution. The process ushered in the era of machines and increasing production even as greater exploitation of resources became the norm. Consumption increased alongside and created more wastes. Unless we seriously re-examine our lifestyles, an irreversible environmental disaster of biblical proportions is just round the corner.

Seeking to strike a balance between economic development and environment, there emerged the concept of sustainable development. The term as such was coined at the 1987 World Commission on Environment and Development or the Brundtland Commission and was defined as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (International Institute of Sustainable Development [IISD], n.d.)

### **Economy-Environment Link**

Environment is simply the sum total of all planetary resources, biotic and abiotic (National Council for Education Research and Training [NCERT], 2007). An ecosystem consists of all living and non living elements of a particular area that are bound in a complex web of relationships with each other and with their surroundings. Environment is, therefore, the sum total of all ecosystems on the planet that serves three important functions:

- provision of resources
- assimilation of wastes

- maintenance of biodiversity and life on earth

The environment supplies us with all resources, including those used for economic production. The processes for their conversion to finished goods and subsequent consumption generates wastes that the environment can only slowly reconvert to resources.

When the rate of resource extraction and of waste generation respectively exceeds the rate of resource regeneration and of waste assimilation, pollution results and hampers the ability of the environment to maintain biodiversity (NCERT, 2007). Such imbalance has gathered pace since the advent of the industrial age.

Biodiversity includes all life on the planet and it is the interrelationships between living creatures and their relation with the environment that sustains life on earth. If we were to continue with unsustainable development, life on earth would disappear sooner or later. Now, that's a grave possibility requiring a prompt remedy lest we all perish.

### **Ecological Footprint as a Measure of Sustainability**

Among the earliest measures of sustainability is the Ecological Footprint (EF) that was developed in the early 1990s by William Rees and Mathis Wackernagel (Bunker, n.d.) in Canada. EF is defined as 'the land area needed exclusively to produce the natural resources that population consumes and to assimilate wastes that it generates indefinitely'. It is measured in hectares per person.

EF is based on the concept of 'carrying capacity' of a given region i.e. the maximum rate of resource extraction and waste discharge that the region can sustain indefinitely without negatively affecting the functioning of its relevant ecosystems. EF links the first two functions of the environment and its third function that is essential for sustainability.

Available capacity is that area of biologically productive land available for a person to obtain his resources and absorb his wastes. On the global scale, only 2.1 hectares of land is available for every person on an average (Pulsipher, 2012). EF is calculated by dividing the total production of a country by the land area needed to support this production and absorb the wastes that the use of this produce will generate. The global average EF was 2.7 ha per person in 2010 (Pulsipher, 2012).

Comparing the available and required land areas, we are overshooting the use of our land area by 33 percent. What is more alarming, we have not even considered the area required for other species. If we were to leave half of this planet for animals, which we as a greedy species will certainly not, the available capacity becomes 1.05 ha person and our usage is 157 percent of the available. From where are we going to bring another one and a half planet?

Simplicity is the foremost merit of the EF concept. Even laymen can easily grasp this concept in terms of the land area needed. And because it is simple, it motivates people to lower their EF. It is based on the scientific principle of lifecycle of resources and the wastes that they generate.

Reflection of its simplicity is also found in its methods of calculations because it clubs together different categories of consumables as well as environmental consequences into a single entity. Such bundling enables general comparison based on the near total consumption, not isolated comparison based on consumption of specific goods.

By focusing on consumption, it brings out the importance of a low demand lifestyle. The lesser you consume, the less wastes you generate and the better you are from the environmental point of view. And since the world is divided into wealthy nations consuming

more and poor nations using fewer resources, EF maintains the emphasis on equity and global justice (Holden, 2004).

A major fallout of EF's simplicity is its rather limited approach, for it includes only those consumption and emission types that are extracted from land and absorbed into land while ignoring conventional pollution of air and water (Acrewoods, n.d.). Then again, it is completely silent on the quality of life of the people (Acrewoods, n.d.).

Some of the techniques employed for the calculation of EF are questionable. For example it does not measure water usage against water availability but takes into consideration the amount of power / energy needed to provide water. Moreover, the methodology employed for measurement of land required to neutralize the emitted carbon dioxide is not foolproof.

### **Environmental Performance Index (EPI)**

Environmental Performance Index (EPI) is probably the best measure of sustainability. EPI was developed in 2008 and has evolved from the Environmental Sustainability Index (ESI). The EPI ranks countries based on how close they have performed on the environmental public health and the ecosystem vitality fronts in relation to declared policy goals in this regard (Environmental Performance Index, 2012).

The EPI score is based on the difference between the quantified policy goal and actual performance of a country on 25 environmental performance indicators that are placed under six defined policy categories. For e.g. if the stated goal is to make drinking water available to 1 million people but was made available to 0.5 million only, the difference will reflect as a low score on this indicator. All the scores are added and the final value is arrived at.

### **Conclusion**

Most statistical techniques and measures cannot be said to be completely irrelevant. Their utility is usually contextual. Possibly as an acknowledgement of its simplicity that imparts mass appeal to it, the Global Footprint Network is trying to make EF relevant to policy makers and businesses by standardization of the calculation techniques used.

## References

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