



Environmental Kuznet's curve

The environmental Kuznets curve represents an empirically observed phenomenon, namely the fact that some environmental problems have become less severe as income levels rise. This phenomenon has been used to argue that there are limits to the contribution that economic growth can make to human well-being is false. However, it is not clear that this is the case. This is mainly because the effect is not observed for all types of pollutants. For energy use, greenhouse gases (GHGs) and waste, for instance, the relationship between emissions and income is linear and increasing, rather than following the pattern depicted in the Figure 2. The available empirical evidence is therefore insufficient to draw any general conclusions regarding the existence of an environmental Kuznets curve.

This phenomenon has been used to argue that economic growth is in fact good for the environment, and that the argument that there are limits to the contribution that economic growth can make to human well-being is false. However, it is not clear that this is the case. This is mainly because the effect is not observed for all types of pollutants. The available empirical evidence is therefore not enough to draw any general conclusions regarding the existence of an Environmental Kuznets Curve effect.

Numerous studies have been carried out to empirically test the EKC Hypothesis. Shafik and Bandyopadhyay (1992) estimated the coefficients of relationships between environmental degradation and per capita income for ten different environmental indicators as part of a background study for the World Development Report 1992 (IBRD, 1992). The indicators were basically: unclean water, lack of urban sanitation, ambient levels of suspended particulate matter in urban areas, urban concentrations of sulphur dioxide, change in forest area between the period 1961 and 1986, the annual rate of deforestation between 1961 and 1986, dissolved oxygen in rivers, faecal coliforms in rivers, municipal waste per capita, and carbon dioxide emissions per capita. Their studies showed that the quality of air declined uniformly with increasing income. Both the measures of deforestation were found to depend on income. River quality turned out to worsen with increasing income. But however CO₂ emissions, a major contributor to the 'green house gases' and municipal wastes did not rise unambiguously with income.

In another study, Panayotou (1993) investigated the EKC hypothesis for sulphur dioxide, nitrous oxide, suspended particulate matter and deforestation. All the fitted relationships were found to be consistent with the EKC hypothesis. This was also explored by Stern et al., (1996) who also critically review the literature on the existence of meaningful EKC relationships. The evidence on the whole concludes that economic growth is not a panacea for environmental quality.

Another issue of importance is that the essential services provided by natural capital stocks may be rundown sustainably over time. As the market cannot reflect all the values of the services provided by the natural environment, this implies that environmental sustainability places a constraint on economic growth. Because the services provided by natural resources are not traded in the markets, they are not reflected in the value of conserving natural resource stocks. Therefore, it is possible that when a natural resource stock is depleted efficiently in terms of maximizing its net present value, critical life-support systems could be lost. The best example for this is the use of forest resources. Forests are being depleted throughout the world since this is the economically optimal strategy for the owners. However, forests not only provide timber but also perform global ecosystem services. Forests absorb carbon dioxide, preserve biodiversity, prevent soil erosion, maintain hydrological cycle, etc. Hence, global environmental sustainability, a prerequisite for economic sustainability, might require that limits be placed on the depletion of natural resource stocks, even if it appears that this means sacrificing some of the monetary value of these stocks. A practical way to ensure that is to create a market for ecological services and functions. This would show in fact that there is no monetary sacrifice.