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The Environmental Kuznet's Curve

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Cornhusker Economics

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The Environmental Kuznet's Curve

Market Report	Yr Ago	4 Wks Ago	2/25/05
<u>Livestock and Products,</u>			
<u>Weekly Average</u>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight	\$81.74	\$86.68	\$86.42
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb	114.50	126.16	127.32
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb	90.54	104.82	103.20
Choice Boxed Beef, 600-750 lb. Carcass	131.73	148.11	139.25
Western Corn Belt Base Hog Price Carcass, Negotiated	59.12	73.79	71.15
Feeder Pigs, National Direct 45 lbs, FOB	47.69	65.62	65.76
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean	66.84	73.78	67.20
Slaughter Lambs, Ch. & Pr., 90-160 lbs., Shorn, Midwest	98.50	110.00	112.25
National Carcass Lamb Cutout, FOB	219.62	249.33	265.50
<u>Crops,</u>			
<u>Daily Spot Prices</u>			
Wheat, No. 1, H.W. Omaha, bu	3.78	3.26	3.51
Corn, No. 2, Yellow Omaha, bu	2.87	1.77	1.93
Soybeans, No. 1, Yellow Omaha, bu	9.39	5.18	5.71
Grain Sorghum, No. 2, Yellow Columbus, cwt	4.89	2.45	2.71
Oats, No. 2, Heavy Minneapolis, MN, bu	1.78	1.91	1.75
<u>Hay</u>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton	115.00	115.00	115.00
Alfalfa, Large Rounds, Good Platte Valley, ton	62.50	62.50	62.50
Grass Hay, Large Rounds, Good Northeast Nebraska, ton	57.50	57.50	57.50
* No market.			

All children hope that they will someday make more money than their parents; just as parents hope their children will live more fulfilling lives than they did. These goals imply economic growth for the society as a whole. If the country expands its economic pie, there is more to go around for everyone. But economic growth could lead to excessive use of natural resources and other environmental amenities. If this is the case, there may be conflicts between growth and environmental protection, both of which are important social objectives. Exactly what is the relationship between economic growth and the use of environmental resources?

It is often useful to represent economic growth as the increase in a measure of output or income (e.g. Gross National Product) on a per capita basis. Growth in per capita GNP means that there is a larger economic pie to be shared. In 1955, Simon Kuznets observed a relationship between economic growth and how equitably the economic pie is divided. He discovered that in countries with low levels of per capita income, total income is distributed relatively equally. As countries experience economic growth, there is a tendency for income inequality to increase. In the early stages of growth, income inequality increases at a faster rate than the rate of per capita income growth. As countries become wealthier, per capita income growth begins to outpace the growth of income inequality. At higher levels of per capita income, inequality begins to decline. Kuznets's observation is summarized in a bell or an inverted-U shaped curve, called the Kuznet's Curve, suggesting that income inequality will rise, peak and eventually decline as per capita income levels rise.

In the 1970s, some researchers began to notice a similar relationship between environmental pressure and per capita income. Malenbaum (1978) found an inverted-U shaped pattern relating rising incomes to the intensity of metal use. In 1991, Grossman and Krueger found the same relationship between per capita income and certain pollutants. It wasn't until 1993 that this relationship was dubbed the Environmental Kuznet's Curve (EKC) by Panayotou (de Bruyn and Heintz, 1999).

Studies of the relationship between economic growth and the environment have provided substantial evidence for the existence of the EKC. This has important implications for public policy. It suggests that environmentally sound production technologies may be too expensive for middle-income countries that are beginning to industrialize (Dasgupta and Mäler, 1995). This idea is also consistent with expectations that there will be a shift of environmentally intensive production from wealthy countries to growing low-income countries. Some have suggested that this relationship means that countries will automatically grow out of their current levels of pollution even if no policies on environmental protection are put in place. Much of the economic analysis of these relationships focuses on estimating the "turning point," that is, the level of income at which it is expected that pollution levels will begin to decline.

But what if irreversible environmental damage occurs before the turning point is reached? For example, many species and ecosystems have biological thresholds, and once environmental degradation has surpassed the threshold there will be irreversible consequences. Entire ecosystems and biodiversity could be lost if the turning point were reached after the threshold had been passed. In these cases, targeted environmental interventions may be needed as complements to economic growth in order to avoid environmental collapse.

To complicate matters, the research seems to predict different turning points depending on the nature of the environmental problem being analyzed. For example, Panayotou (1993) found that the turning points for emissions of SO₂, particulates, and NO₂ and for deforestation occur at per capita income levels of \$3,000, \$4,500, \$5,500 and \$1,200, respectively (de Bruyn and Heintz, 1999). Other researchers have found very different turning points for the same variables. For example, Seldon and Song found that

the turning points for SO₂, particulate and NO₂ emissions were \$10,300, \$10,300 and \$11,200, respectively (de Bruyn and Heintz, 1999). Other researchers have even found N-shaped curves showing that the environmental variable in their studies begins to increase again at very high levels of income (Panayotou, 2000).

Much of the current research on economic growth and environmental sustainability is aimed at establishing the theoretical explanations for the empirical results showing that there is an EKC. Theoretical insights may lead to more precise measures of this relationship. We are drawing on this theoretical literature in the empirical analysis of the impact of economic growth on deforestation in tropical countries. One of our hypotheses is that greater democratic freedoms and lower income inequalities will mitigate the effect of economic growth on deforestation. Confirmation of this hypothesis would have important policy implications for development assistance and global environmental policies.

Sources:

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- De Bruyn, S & R Heintz. (1999). The environmental Kuznets curve hypothesis. *Handbook of Environmental and Resource Economics*. Massachusetts: Edward Elgar.
- Panayotou, T. (2000). *Economic Growth and the Environment* (Working Paper). Cambridge, Massachusetts: Center for International Development at Harvard University.

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