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Economic Development, Environmental Degradation, and the Persistence of Deprivation in Poor Countries

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The Beijer Institute of Ecological Economics
The Royal Swedish Academy of Sciences
Box 50005 SE-104 05 Stockholm Sweden
Phone: +46 8 673 95 00 Fax: +46 8 15 24 64
E-mail: beijer@beijer.kva.se

Economic Development, Environmental Degradation,

and the Persistence of Deprivation in Poor Countries*

by

Partha Dasgupta**

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** The author is the Frank Ramsey Professor of Economics at the University of Cambridge and Fellow of St. John's College, Cambridge.

Economic Development as Economic Growth

As a subject of inquiry the economic development of poor countries is only a half-century old. Classical economists were certainly much concerned to identify the social processes that create prosperity;[1] but it was not until the emergence of independent nations in Asia and Africa that economic development became a specialised field. In order to discover ways to improve upon contemporary development processes economists explored the impact of economic decisions on human well-being not only in the present and near future, but in the distant future too. Unfortunately they also became attached to the idea that an increase in gross national product (GNP) is the key to economic development and poverty elimination.[2] To be sure, GNP growth was recognised to be a means only, but the means took on such a life of their own in policy discussions, that if someone were to ask, "growth in what?", the response would promptly be, "growth in GNP."

With this background development economics soon acquired a central dogma, that the key to economic progress in poor countries is in increasing the rate at which capital is manufactured there.[3] Admittedly, the United Nations' Human Development Index (HDI) has recently been added to the list of national economic indicators, and is regarded by many to reflect human values more closely than GNP. But HDI, in common with GNP, for the most part reflects current well-being.[4] This is a major shortcoming. If the aim is to identify patterns of change that could be expected to lead to sustained development, we should peer not only at the present and near future, but at the distant future too.

Wealth and Well-Being

In speaking of an economy, I want to cast a wide net here. The economy in question could

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[1] Recall the title of that most famous economics treatise of all, Adam Smith's An Inquiry into the Nature and Causes of the Wealth of Nations.

[2] Of an enormous literature adopting this viewpoint, see the World Bank's annual World Development Report 1986 (New York: Oxford University Press).

[3] The classic on this line of thinking is W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labour", Manchester School of Economic and Social Studies, 1954, vol. 22, no. 2, pp. 139-91.

[4] HDI is a combined index of GNP per head, life expectancy at birth and literacy. Country estimates of HDI are offered annually in the annual Human Development Report of the United Nations Development Programme. Since the weaknesses that I identify below in GNP as a measure of social well-being are shared by HDI, I shall not comment on the latter here. For an account of HDI's particular weaknesses, see my Human Well-Being and the Natural Environment (Oxford: Oxford University Press, 2001).

be that of a household, or it could be that of a village, a district, a state, a nation, or even the whole world. An economy's prospects are shaped by its institutions and by the size and distribution of its capital assets. Taken together, they are its productive base. Note though that institutions are different from capital assets, in that the former comprise a social infrastructure for guiding the allocation of resources, among which are the capital assets themselves.

We have a name for the overall worth of an economy's capital assets: wealth. Although economic statisticians interpret wealth narrowly (I show this below), the measure is in fact an inclusive one. Wealth is based on a comprehensive listing of assets, one that includes not only manufactured capital (roads and buildings; machinery and equipment; cables and ports) and what economists refer to as human capital (knowledge and skills), but also natural capital (oil and minerals; fisheries, forests and, more broadly, ecosystems).

Wealth is an aggregate measure. To say that an economy's wealth has increased is to say that in terms of their worth, there has been an overall accumulation of its capital assets. By the same token, to say that wealth has declined is to say that there has been an overall decumulation. Of course, even if some assets have decumulated, wealth would increase if there has been a compensatory accumulation of other assets in the economy. In what follows I shall use the term "genuine investment" to mean any change in wealth, regardless of whether the change is a decline or an increase. Genuine investment is to be contrasted from recorded investment. Since many of the services obtained from natural capital are missing from standard economic accounts, recorded investment could be positive even if genuine investment were negative. This would happen if the economy accumulated manufactured and human capital, but destroyed or degraded natural capital at a fast rate - a possibility I explore below.

Now, it is an interesting and important fact that genuine investment is a key to sustained development. By this I mean that, subject to certain qualifications, a rise in wealth per person in an economy corresponds to an increase in the average well-being of present and future generations. This is the sense in which wealth is a measure of human well-being. Concommitantly, it is the sense in which an accumulation of wealth corresponds to sustained development, or to use an earlier term, economic progress.[5]

[5] For a study of indices that reflect increases in human well-being over time, and for conditions under which genuine investment is the ideal index, see Partha Dasgupta and Karl-Göran Mäler, "Net National Product, Wealth, and Social Well-Being", Environment and Development Economics, 2000, vol. 5, no. 2, pp. 69-93; Partha Dasgupta, Human Well-Being and the Natural Environment (Oxford: Oxford University Press, 2001); and Kenneth J. Arrow, Partha Dasgupta, and Karl-Göran Mäler (1), "Evaluating Projects and Assessing Sustainable Development in Imperfect Economies", Discussion Paper, Beijer International Institute of Ecological Economics, Stockholm, 2002 (forthcoming, Environmental and Resource Economics,

Now consider in contrast GNP, which is conventionally taken to be the sum of an economy's rates of consumption and gross investment in manufactured and human capital. GNP misleads not only because changes in the size and composition of much natural capital are ignored by it, but also because, being gross national product, the index does not acknowledge that capital assets depreciate. It is thus possible for GNP to increase over a period of time even while the economy's wealth declines. This would happen if increases in GNP are brought about by mining capital assets - for example, degrading ecosystems and depleting oil and mineral deposits -, without investing appropriate amounts of output in the accumulation of other forms of capital, such as knowledge and skills. There is then little reason to expect movements in GNP to parallel movements in wealth. Of course, a situation where GNP grows and wealth declines cannot last forever. If wealth decumulates sufficiently, GNP will eventually have to decline also. But the moral is telling: GNP (or for that matter HDI) is not a measure of human well-being, meaning that movements in GNP (or for that matter HDI) are a poor basis for judging economic progress.

The Environment: Luxury or Necessity?

But scratch an economist, and you are likely to find someone who regards the natural environment as a luxury, not a part of the productive base of economies. For it is even today commonly thought that, to quote an editorial in the UK's The Independent (4 December 1999), "... (economic) growth is good for the environment because countries need to put poverty behind them in order to care"; or, to quote The Economist (4 December, 1999: 17), "... trade improves the environment, because it raises incomes, and the richer people are, the more willing they are to devote resources to cleaning up their living space."

These passages reflect a detached view, observed from Olympian heights. The viewpoint encourages even economic egalitarians to justify using GNP as a measure of human well-being in poor countries. After all, as the environment is a mere consumption good of the rich, why should one care if it depreciates during the early stages of economic development?[6] Closer to home,

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2003), and (2) "The Genuine Savings Criterion and the Value of Population", Discussion Paper, Beijer International Institute of Ecological Economics, Stockholm, 2002 (forthcoming, Peter J. Hammond, ed., Essays in Honour of Mordecai Kurz (Berlin: Springer Verlag, 2003). In this lecture I ignore the question of how capital assets ought ideally to be valued if wealth is to reflect human well-being, except for noting that market prices would be good approximations for some assets, but not for others.

[6] The view's origin can be traced to the World Bank's World Development Report 1992 (New York: Oxford University Press). For an assessment of the empirical findings that led to the view, see Kenneth J. Arrow, Bert Bolin, Robert Costanza, Partha Dasgupta, Carl Folke, Crawford S. Holling, Bengt-Owe Jansson, Simon A. Levin, Karl-Göran Mäler, Charles Perrings, and David Pimentel, "Economic Growth, Carrying

however, matters look different. Producing a multitude of ecosystem services, a large part of what Nature offers us is an essential part of our productive base. These services include maintaining a genetic library, preserving and regenerating soil, fixing nitrogen and carbon, recycling nutrients, controlling floods, filtering pollutants, assimilating waste, pollinating crops, operating the hydrological cycle, and maintaining the gaseous composition of the atmosphere. A number of these services filter into a global context (e.g., the atmosphere as a sink for pollutants), many are spatially localized.[7]

Spatially localized natural assets are of the utmost importance to the world's poor. When wetlands, inland and coastal fisheries, woodlands, ponds and lakes, and grazing fields are damaged (say, owing to agricultural encroachment or urban extensions or the construction of large dams), traditional dwellers suffer. For them - and they are among the poorest in society - there are frequently no ready alternative sources of livelihood to their local resource base. In contrast, for rich eco-tourists there is something else, often somewhere else, which means that there are alternatives. The range between a need and a luxury is enormous and context-ridden. Macroeconomic reasoning glosses over the heteregeneity of Earth's resources and the diverse uses to which they are put - by people residing at the site and by those elsewhere. National income accounts reflect this wrong reasoning by failing to record a wide array of our transactions with Nature.

The reason why changes in the size and composition of natural capital are in large measure missing from national accounts is that Nature's services most often do not come with a price tag. The reason for that is that property rights to natural capital are often very difficult to establish, let alone to enforce. And the reason for that is that natural capital is frequently mobile. At the broadest level soil, water, and the atmosphere (which are capital assets themselves) are media that enable capital assets to connect among themselves and flourish, meaning that a disturbance to any one asset can be expected to reverberate on many others at distances away, sometimes at far distances. Under current practice though the consequences of the connectedness of natural capital can easily go

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Capacity, and the Environment", Science, 1995, vol. 268, pp.520-1; and the commentaries on the note in invited symposia in Ecological Economics, 1995, vol. 15, no. 1; Ecological Applications, 1996, vol. 6, no. 1; and Environment and Development Economics, 1996, vol. 1, no. 1. See also the special issue of Environment and Development Economics, 1997, vol. 2, no. 4. In the text that follows I focus on a different set of weaknesses in the view than is identified in the Arrow et al. note.

[7] For the economics of ecosystem services, see my book, The Control of Resources (Cambridge, MA: Harvard University Press, 1982). A modern classic on the science of ecosystem services is Gretchen Daily, ed., Nature's Services: Societal Dependence on Natural Ecosystems (Washington, DC: Island Press, 1997).

unnoted in economic transactions.[8] It can then be that those who destroy mangroves in order to create shrimp farms or cut down forests in the uplands of watersheds are not required to compensate fishermen dependent on the mangroves or farmers and fishermen in the lowlands whose fields and fisheries are protected by the upland forests. Economic development in the guise of growth in per capita GNP can come in tandem with a decline in the wealth of some of the poorest members of society.

Nature's Services and the World's Poor

Rural communities in poor countries long ago recognised the local connectedness of Nature's services. And they devised institutional mechanisms to cope with the problems created by that connectedness. A pond or a village woodland is a coupled system of organic and inorganic material, offering multiple services - some offer current consumption goods, while others are capital services that can be expected to generate consumption goods in the future. This feature of the internal structure of ponds and village woodlands makes them unsuitable for division into private property. In recent years anthropologists, ecologists, economists, and political scientists have identified a wide variety of non-market institutions that evolved over centuries to mediate economic transactions in Nature's services. These institutions are frequently communitarian and are based on long term relationships among community members. Moreover, they were designed to respond to the character of the natural capital under their jurisdiction. For example, it is usually not difficult to observe how many animals someone has let into the village grazing field, but it is not always easy to determine the catch someone has made in a fishery. Institutions for managing grazing land and coastal fisheries reflect these differences.

The importance of common property resources for the rural poor in semi-arid regions was demonstrated in a remarkable paper by the economist Narpat S. Jodha.[9] In a sample of Indian villages he estimated that the proportion of household income from such property was 15-25 percent. Recent work on village data from Zimbabwe report the proportion to be as high 40 percent. Not surprisingly, it is the poorest households that are most dependent on them. Unhappily, in recent years communitarian institutions have eroded in many of the poorest regions of the world. There are a number of reasons for this, among which State interference in the way they function would appear to have been prominent, especially in Sahelian Africa. State usurpation of common property (e.g. for logging or for construction of large dams) without adequately compensating local

[8] Economists refer to unrecorded economic interactions as "externalities".

[9] "Common Property Resources and the Rural Poor", Economic and Political Weekly, 1986, vol. 21, pp. 1169-81. The theory underlying managed common-property resources had been developed earlier, in Partha Dasgupta and Geoffrey Heal, Economic Theory and Exhaustible Resources (Cambridge: Cambridge University Press, 1979).

inhabitants can be another reason. By creating a fertile ground for battles over resources, large population increases have been yet another reason.

Ironically, the growth of markets may have contributed as well, by changing the incentives people have for continuing to remain in long term relationships. The point is that long term relationships are almost always sustained by social norms, such as norms of reciprocity. The growth of markets in one set of goods and services can weaken the incentives people have for remaining in long term relationships involving transactions in other goods and services. When such incentives weaken, social norms decay. But the decline in incentives does not occur equally among all economic actors. When, for example, market opportunities in the neighbouring town expand, it is the young men of the village who are able to take advantage of them, not the women with children, nor the old. But it is often the women and children who are responsible for working the commons (collecting firewood, water, herbs, and fruit). So we should not be surprised that they get hurt when norms decay. When decaying communitarian institutions are neither stayed nor replaced by effective institutions to complement the growth of markets, the economically weakest are the most to suffer. Economic theory has predicted such possibilities;[10] and rural studies in the world's poorest regions have confirmed them.[11]

Any system, human or otherwise, responds when perturbed. Public policies lead to all sorts of effects rippling through unnoticed by those who are unaffected, because there may be no obvious public signals (e.g., price changes) to accompany them. Tracing the ripples requires an understanding of non-market interactions and of their interplay with markets. In order to identify policies that would help generate sustained development, decision makers must among other things evaluate the ripples, which means that Nature's services need to be valued first. But this is rarely done. So it is all too possible for the number of people who are recorded as being poor to decline

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[10] See Partha Dasgupta, An Inquiry into Well-Being and Destitution (Oxford: Clarendon Press, 1993) and Human Well-Being and the Natural Environment (Oxford: Oxford University Press, 2001).

[11] See for example Bina Agarwal, Cold Hearths and Barren Slopes: The Woodfuel Crisis in the Third World (New Delhi: Allied Publishers, 1986); J.M. Acheson, "Capturing the Commons: Legal and Illegal Strategies", in T.L. Anderson and R.T. Simmons, eds., The Political Economy of Customs and Culture: Informal Solutions to the Commons Problem (Lanham: Rowman and Littlefield, 1993); Jean-Marie Baland and Jean-Philippe Platteau, Halting Degradation of Natural Resources: Is There a Role for Rural Communities? (Oxford: Clarendon Press, 1996); Frances J. Seymour and N.K. Dubash, The Right Conditions: The World Bank, Structural Adjustment, and Forest Policy Reform (Washington, DC: World Resources Institute, 2000); and Narpat S. Jodha, Life on the Edge: Sustaining Agriculture and Community Resources in Fragile Environments (Delhi: Oxford University Press, 2001).

over time even while a proportion of the poor become poorer still, but remain undetected. Recent findings, that growth in GNP per head in poor countries have come allied to poverty reduction suffer from this weakness: the data only cover market transactions and do not reveal changes in the composition of poverty during the growth process.[12] The weaknesses in present-day national accounts mirror the weaknesses in contemporary policy thinking.

Genuine Investment in Poor Countries

Even though there are no markets - and therefore no market prices - it is possible to assign notional prices to many of Nature's services if we are prepared to put in the effort and apply some low cunning.[13] Economists call them "shadow prices" (or alternatively, "accounting prices"). Shadow prices measure the social worth of goods and services in an economy, and are the ones to use in determing movements in wealth. By the social worth of a capital asset I mean the contribution it would be expected to make to human well-being over time.

By estimating shadow prices and then adding net investment in human and natural capital to published figures for investment in manufactured capital, the World Bank has recently provided estimates of genuine investment in a large number of countries.[14] There is a certain awkwardness in the steps the investigators have taken to arrive at their figures. Their accounts are also incomplete. For example, among the resources making up natural capital, only commercial forests, oil and minerals, and the atmosphere as a sink for carbon dioxide were included (not included were water resources, forests as agents of carbon sequestration, fisheries, air and water pollutants, soil, and biodiversity). So there is an undercount, possibly a serious one. Moreover, some of the methods deployed for estimating shadow prices are dubious. Nevertheless, if we are to read the true macroeconomic character of the recent development experience in poor countries, we have to start somewhere. With this in mind I recently used the World Bank figures to estimate changes in wealth per head over a quarter century starting 1970 in sub-Saharan Africa, the Indian sub-continent, and China. Taken together, these regions are where the bulk of the world's 1 billion poorest live. They

[12] See, for example, David Dollar and Aart Kraay, "Growth Is Good for the Poor", Discussion Paper, World Bank, Washington, DC, 2000; and Gaurav Dutt and Martin Ravallion, "Is India's Economic Growth Leaving the Poor Behind?", Journal of Economic Perspectives, 2002, vol. 16, no. 3, pp. 89-108.

[13] The search for methods of estimating notional prices of natural capital is an active field of research today. The hard part of the work lies in determining the connectedness of natural capital from a study of the ecological processes at work.

[14] Kirk Hamilton and M. Clemens, "Genuine Savings Rates in Developing Countries", World Bank Economic Review, 1999, vol. 13, no. 2, pp. 333-56. The World Bank now publishes updates of its figures for genuine investment in their annual publication, World Development Indicators.

are also the regions that have experienced the largest growth in population.

The first column of figures in the accompanying table provides the annual rate of growth of population over the period 1965-96. Notice that all but China experienced rates of growth in excess of 2 percent per year, sub-Saharan Africa and Pakistan having grown in numbers at nearly 3 percent per year.

The second column of the table contains my estimates of the annual rate of change in wealth per head during 1970-1993.[15] The striking message is that in all but China there has been a decumulation in per capita wealth. Moreover, if we compare the figures in the first two columns, we see that during the period in question Bangladesh and Nepal became poorer in the aggregate, not just on a per capita basis. In contrast, the other regions accumulated wealth in the aggregate. But wealth did not keep pace with population in India, Pakistan, and sub-Saharan Africa. All this may not be a surprise in the case of sub-Saharan Africa, which is widely known to have regressed in terms of most economic indicators. But the figures for Bangladesh, India, Nepal, and Pakistan should cause surprise. They certainly surprised me when I first estimated them. Even China, so greatly praised for its progressive economic policies, has just about managed to accumulate wealth in excess of population growth. In any event, the estimates of genuine investment do not include soil erosion or urban pollution, both of which are thought by experts to be especially problematic in China.

How do changes in per capita wealth compare with changes in conventional measures? The third column of the table contains figures for the rate at which GNP per head changed during 1965-96; and the fourth column records whether the change in the United Nations' Human Development Index over the period 1987-1997 was positive or negative.[16]

Notice how misleading our assessment of long-term economic development in the Indian sub-continent would be if we were to look at growth rates in per capita GNP. Pakistan, for example, would be seen as a country where GNP per head grew at a healthy 2.7 percent per year, implying that the index doubled in value between 1965 and 1993. The corresponding figure in the second column implies though that the average Pakistani became poorer by a factor of about 1.5 during that same period.

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[15] The table was originally prepared for my Presidential Address to the Royal Economic Society at its annual conference in St. Andrews, Scotland, in July 2000, and was published as "Valuing Objects and Evaluating Policies in Imperfect Economies", Economic Journal, 2001, vol. 111 (Conference Proceedings), pp. 1-29. The paper explains the steps that were taken to convert the World Bank's estimates of genuine investment into figures for changes in wealth per head.

[16] The period covered for HDI is short only because the index was first constructed in the United Nations Development Programme's Human Development Report 1990.

Bangladesh is recorded as having grown in terms of per capita GNP at 1 percent per year during 1965-1996. The figure in the second column of the table implies that at the end of the period the average Bangladeshi was about half as wealthy as she was at the beginning.

The case of sub-Saharan Africa is of course especially depressing. At an annual rate of decline of 2 percent in per capita wealth the average person in the region became poorer by nearly a factor of two. The ills of sub-Saharan Africa are routine reading in today's newspapers and magazines, but the ills are not depicted in terms of a decline in wealth. The table suggests that sub-Saharan Africa has experienced an enormous decline in its capital assets over the past three decades.

What of the Human Development Index? In fact it misleads even more than per capita GNP. As the second and fourth columns of the table show, HDI offers a picture that is the precise opposite to the one we should obtain when judging the performance of poor countries. For example, for sub-Saharan Africa the index grew, but for China it declined.[17] Bangladesh and Nepal have been exemplary in terms of HDI. However, as we have seen, the table suggests that both countries have decumulated their assets at a high rate.

The figures in the table for changes in per capita wealth are rough and ready and we should not regard them with anything like the certitude we have developed over the years for international statistics on GNP and for the demographic and morbidity statistics of poor countries. My estimates of changes in per capita wealth in the world's poorest countries are a first cut at what is an enormously difficult set of exercises. We would by now have been far ahead in our understanding of what really has happened in poor countries if development economists had taken Nature's services seriously in the past. The theory on the basis of which I have tried to reassess the recent economic history of the poorest regions is firm, it is the applied counterpart that remains very weak. But the figures, such as they are, show how accounting for human and natural capital can make for substantial differences to our conception of the processes of economic development.

There is an understandable temptation on the part of development practitioners, both in academia and international organizations, to focus on contemporary history's many winners. After all, or so it is pointed out regularly, people everywhere on average live longer today than they did in the past, eat better, and (excepting in sub-Saharan Africa) earn more. But village level studies in the poorest regions of the world, being more discriminatory, have frequently revealed something else also, or so I have found. In this lecture I have offered a framework, based on modern economics, that is able to read not only contemporary history's winners, but also its many losers. I have also tried to show how a revision of national accounts can enable macro level statistics to better reflect micro level facts. It seems to me such correspondence is necessary if we are to search

[17] The reason China is seen to have regressed is that HDI is a relative index: even when a country has improved in terms of each component of HDI, it could still show a deterioration if some other countries have improved even more.

for policies that can be expected to lead to sustained development.

Table

Economic Change in the Poor World: 1970-93

	g(L)[b]	g(W/L)[c]	g(Y/L)[d]	∇(HDI)[e]
Bangladesh	2.3	-2.40	1.0	+ve
India	2.1	-0.50	2.3	+ve
Nepal	2.4	-2.60	1.0	+ve
Pakistan	2.9	-1.70	2.7	+ve
Sub-Saharan Africa	2.7	-2.00	-0.2	+ve
China	1.7	1.09	6.7	-ve

[a] g(L): average annual percentage rate of growth of population, 1965-96.

[b] g(W/L): average annual percentage rate of change in wealth per head at constant prices. Adapted from Kirk Hamilton and M. Clemens, op. cit. and from data provided to me in personal communication by Katie Bolt of the World Bank.

[c] g(Y/L): average annual percentage rate of change in GNP per head, 1965-96.

[d] ∇(HDI): sign of change in the United Nations' Human Development Index, 1987-97.