

## THE NATURE OF ECONOMIC DEVELOPMENT

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A central message of modern development economics is the importance of income growth, by which is meant growth in gross domestic product (GDP). In theory, rising GDP creates employment and investment opportunities. And as incomes grow in a country where GDP was once low, households, communities, and government are able increasingly to set aside funds for the production of things that make for a good life. Today GDP has assumed such a significant place in the development lexicon, that if someone mentions “economic growth”, we know they mean growth in GDP. But if GDP is to grow, the state must establish conditions that create incentives to households, firms, communities, charities, and various layers of government to allocate goods and services in productive uses. The role of the state in economic development is thus both active (maintaining the rule of law and producing other public goods; investing in physical infrastructure, primary healthcare, and education) and passive (permitting markets to operate; supporting freedom to express oneself). No doubt GDP growth in itself doesn’t guarantee a reasonable distribution of incomes, but that only provides a case for including taxes and transfers on the government’s agenda. Or so the argument would have it.

There is general appreciation that the programme of economic liberalisation and structural reforms the Government of India initiated in the early 1990s gave rise to unprecedented economic growth for nearly two decades. During the first decade of this century GDP grew at an annual rate of 7.5%. That was accompanied by improvements in a number of other economic indicators. For example, the proportion of people whose incomes are below the country’s official poverty line declined from 45% in the early 1980s to 28% in 2005. The decline is impressive, but the latter figure tells us that the country still harbours widespread deprivation.

Over the years the persistence of inequities in India in the distribution of health and education has been a reason for complaint among social commentators. As the World Bank noted recently, 45% of children under five are underweight and 25% of women are illiterate, figures that are worse than the corresponding ones in a number of countries that are poorer in terms of GDP per head. So, if you look at changes that have taken place in the indicators of the quality of life in India since the early 1990s, the country would appear to be a winner. On the other hand, if you study the current figures in the country for the same indicators and compare them to those in some countries where GDP per head is lower, India would seem to be a loser. Depending on your perspective, the proverbial glass would appear to be either half full or half empty.

Bhagwati and Panagariya (2013) begin by exposing a number of myths (their term) that critics have created about the country’s recent performance in health, education, and the distribution of income. They recount that economic growth has come allied to improvements in a number of measures of education, health and poverty. They go on to claim that the reforms necessary for successful economic development over the long run constitute two stages. First, there are to be what the authors call “Track I reforms”, aimed at GDP growth, which enable the poor to pull themselves up in the income ladder. Changes aimed at providing healthcare, education, and other forms of support for the poor, all of which would be made possible by the increased tax revenues from higher incomes, are Track II reforms. Without the former phase, the authors argue, there would be no finance to produce the latter benefits. They see the fast growth rates emanating from Track I reforms since the early 1990s as enabling the Indian government to move more fully to Track II in due course. The target in Dreze and Sen (2013) is the neglect by successive governments of health and education, which the authors interpret as having given rise to the enormous inequities in human “capabilities” that characterise the Indian economy.

In contrast to Bhagwati and Panagariya, who study changes over time in India’s socio-economic indicators, Dreze and Sen compare the current state of affairs in India with other poor countries and find India wanting. For Dreze and Sen the sequencing of Track I and Track II reforms is repugnant. They insist a far better pattern of economic development would have been one where GDP growth was to an extent traded off for more rapid improvements in health and education. The authors sift evidence from the experiences of Japan, South Korea, and Taiwan among other successful countries to argue that the “extent” is in principle a lot less (and may even be negative) than what Bhagwati and Panagariya imagine, because improvements in health and education raise human productivity and so raise growth rates in GDP. The authors are exasperated with the patience the

country's poor have displayed while waiting for better times, so the concluding chapters of their book are on the role deliberative democracy could play in stirring the electorate into action.

Nature is life's support and promoting system, but orthodox development thinking is oblivious of its role as a capital asset. When the absence is noticed, those who advocate the priority of GDP growth in development policy say that nature is a luxury that can wait to be taken care of until the economy generates sufficient incomes. Intellectual support for the viewpoint was offered in the World Bank's *World Development Report 1992*, where the authors used data on air quality in urban sites to conclude that there is a U-shaped relationship between GDP and environmental quality. The relationship was christened, inevitably perhaps, as the "environmental Kuznets curve". The problem is, air quality is able to carry very little of nature's load. Air particulates blow away to other places within days, whereas a broken reef would take centuries to recover. Damage to natural capital is all too frequently irreversible. That is why as a metaphor for development prospects the environmental Kuznets curve should be rejected.

An entirely novel justification for excluding natural capital from economic models has been put forward implicitly by Dreze and Sen. They write (p 42), "(i)f development is about enhancing human freedoms and the quality of life...then the quality of the environment is bound to be part of what we want to preserve and promote". The authors would appear to regard that truth to be a licence to ignore the economics of the natural environment. Devoting all of three pages to sustainable development, their remarks on the subject don't go beyond what is to be found routinely in Sunday supplements. They say, for example, that the Indian government has a plan to construct more than 600 dams on the Ganges and its tributaries. The authors don't like it, but don't tell us why, other than that there would be adverse environmental consequences. In a book that contains 35 pages explaining why education is good for us, readers should expect a paragraph or two explaining why dams are bad for us. The reasoning would seem to be that because nature is vital to the development of human capabilities, its worth is so deeply embodied in the value of those capabilities that it doesn't require unearthing.

GDP is the market value of the flow of final goods and services in a year. The rogue word in the acronym is "gross", which means that the depreciation of capital assets isn't counted. If the wetland is drained to make way for the mall, the construction of the latter contributes to GDP but the destruction of the former goes unrecorded. Intuition tells us that if the social worth of the mall were less than the social value of the wetland, the economy's productive base would decline, which would then have adverse consequences for the current and future generations. An economy's GDP could be made to grow and its HDI made to improve for a time by "mining" natural capital (decimating forests, damaging soil, destroying fisheries, depleting rechargeable aquifers, reducing biodiversity). The good times couldn't go on forever though, because no economy can survive without natural capital. So

both GDP and HDI would decline in due course. GDP does have an important role in economic analysis and policy but not as a welfare index.

Bhagwati and Panagariya see government restrictions everywhere and Dreze and Sen can't take their eyes off health and education; but it's hard for some of us not to help noting also the pervasiveness of *externalities*, which are the unaccounted for consequences for others (including future people) of decisions made by each one of us on reproduction, consumption, production and use of the natural environment. In recent years the externalities present in the chain linking poverty, population growth, and degradation of the local natural-resource base in poor countries have been studied both theoretically and empirically. None of the three factors has been found to be a direct cause of the others; rather, each would appear to influence and be in turn influenced by the others. For example, a deterioration in the way a community manages the local woodland and water source or the way the government adjudicates property rights over forest land may mean an increase in the need for "hands" in each household, which then puts further pressure on the woodland and water source; and so on, in a cycle. Empowering women and expanding education certainly help to reduce fertility, but the externalities or spillover effects just alluded to are a potent presence. Over the past few decades a number of economists have worked to introduce nature into economics in a seamless way. It has required of them to rework the economics of the household, communities, and other non-market institutions, recast national accounting, reconstruct the theory of macroeconomic development and public and trade policy, and revise the theory of collective action. The literature integrates development and environmental economics. Studies have uncovered connections between the spatially localised persistence of rural poverty in the Indian subcontinent and the habitat destruction accompanying growth in GDP and population. The socio-environmental processes defining those links have been found to depend on the site and context. That means to borrow lessons from the development experience at one site, let alone one country, in order to inform policy in another is unreliable.

The processes have been found also to be non-linear, in many cases significantly so. That in turn means such linear extrapolations of empirical data, as in the claim that “every 1 per cent increase in GDP per head reduces poverty by around 1.7 percent” (*The Economist*, 1 June 2013: 24), are misleading. It also means that the processes can harbour tipping points that portend a collapse of the natural resource-base and a sudden dramatic reduction in a community’s economic prospects. The sources of such catastrophes can be population pressure and unprotected property rights over fragile resources. Imagine what would happen to a city’s inhabitants if the infrastructure connecting it to the outside world were to break down without notice. Vanishing sources of water, deteriorating grazing fields, desiccated slopes, wasting mangroves, and bleached coral reefs are spatially confined instances of a corresponding breakdown among the rural poor. Civic strife and migration are often related phenomena.

As the literature is informed by theory and increasingly validated by empirics, there is now cause to revise the orthodox view of economic life in both the small and the large. This new literature has also increased our understanding of the strengths and limitations of collective action, household attitudes toward risk, and a number of salient socio-environmental processes (for example, the dynamics of open-access resources). Space forbids discussing them further. My aim here is a lot more limited. It is to review the way the literature has reconstructed the foundations of economic evaluation. In what follows, readers could interpret an “economy” alternatively as a household, a village, a community, a district, a state, a nation, or indeed the entire world. But data are often compiled and published at the national level. So, when I come to report an empirical study on sustainable development, the economy is taken to be a nation, namely, India.

Contemporary models of economic growth and development regard nature to be a fixed, indestructible factor of production (Barro and Sala-i-Martin 2003; Helpman 2004). The problem with the assumption is that it is wrong. Nature is a mosaic of degradable assets. Agricultural land, forests, watersheds, fisheries, freshwater sources, estuaries, wetlands, the atmosphere – more generally, *ecosystems* – are assets that are self-regenerative, but can suffer from deterioration or depletion through human use. (Oil and natural gas are at an extreme; they are non-renewable.) The term “self-regenerative” shouldn’t be taken to mean that natural resources regenerate in isolation when left untouched by humans. Nature, or *natural capital*, is an interconnected body of assets undergoing change over time in size and character. The regenerative capacity of one depends on the mosaic of which it is a part. The processes driving those changes differ in spatial scales, operate at different speed, and are almost invariably non-linear. It should be no cause for surprise that nature is “complex”. Human activities affect nature’s processes just as nature’s processes influence the options we humans face and the choices we make. The mutual influence is so powerful today that to many scientists, talk of “nature’s processes” makes little sense. To them “socio-environmental processes” is a more appropriate term. A few broad principles are understood, but the Devil lies in the details; and the details affect the daily lives of households everywhere. Substitution possibilities between reproducible capital and human capital, on the one hand, and vital forms of natural capital, on the other, become increasingly limited as the latter dwindles in size and quality (Ehrlich and Goulder 2007).

Unfortunately the cost of recovering those dwindling assets also increases, which is another way of saying that the processes suffer from hysteresis (worse, irreversibility). This is as true of village waterholes and mangrove forests as it is of carbon concentration in the atmosphere. Some ecological stresses are global, while many are spatially localised; some occur slowly and may therefore miss detection until it’s too late, while others are all too noticeable and a cause of persistent societal stresses. That may be why there is tension among the senses of urgency people express about carbon emissions and acid rains that sweep across regions, nations, and continents; on the stresses communities face when grasslands transform into shrub-lands; and on declines in firewood, biodiversity, water sources, and soil productivity that are specific to the needs and concerns of the poor in small, village communities. Because socio-environmental processes are imperfectly understood, environmental problems present themselves in different ways to people. Some identify environmental problems with population growth, while others identify them with wrong sorts of economic growth; then there are those who view the problems through the spectacle of poverty in poor countries. Each of those visions is correct. There is no single environmental problem; there is an innumerable collection of them.

Why are environmental externalities pervasive and quantitatively significant? One reason is that property rights to prominent classes of natural capital are difficult to define and enforce (forest patches, open seas). By property rights I mean not only private rights, but communitarian and public rights too. And one reason property rights are difficult to define, let alone to enforce, is natural capital’s tendency to move. The wind blows, particulates diffuse, rivers flow, fish swim, birds and insects fly, and even earth worms are known to move. In extreme cases the market price of natural capital is nil even when they have considerable social worth. “Green” taxes would be a way to close the difference. The gap between the market price and social worth of natural capital has meant

that technological innovations are biased against nature. Entrepreneurs, understandably, seek innovations that economise on expensive factors of production, not those that are cheap. It should be no surprise then that modern technology has proved to be rapacious in its use of nature's services. In the absence of green taxes, public subsidy for the development of green technologies is a straightforward implication of this reasoning (Dasgupta 2004). Natural capital is of direct use in consumption (fisheries), of indirect use as inputs in production (oil and natural gas; ecosystem services), and of use in both (air and water). The value of natural capital can be "utilitarian" (as a source of food

or as a keystone species – many economists call it "use-value"); it can be aesthetic (places of scenic beauty), religious (sacred groves), intrinsic (primates); or it may be all those things (biodiversity). Their worth to us could be from extraction (timber, gum, honey, leaves and barks, fish) or from their presence as a stock (forest cover, marshes, and reefs), or from both (watersheds). The stock could be an index of quality (air quality) or quantity. Quantity is sometimes expressed as a pure number (population size); in various other cases it is, respectively, (bio)mass, area, volume, depth. Even quality indices are often based on quantity indices, as in "parts per cubic centimetres" for measuring atmospheric haze. The above classification is useful in economic evaluation because it is based on the reasons we value nature. For understanding the changing landscape in contemporary economies, however, the classification in MEA (2005a-d) is more useful. Natural capital was classified in those publications in terms of the kinds of services they provide. Moreover, the focus was on ecosystems. Pollutants are the reverse side of natural capital. One way to conceptualise "pollution" is to consider the depreciation of capital assets. Acid rains damage forests; industrial seepage and discharge reduce water quality in streams and underground reservoirs; sulphur emissions corrode structures and harm human health; and so on. The damage inflicted on each type of asset (buildings, forests, fisheries, human health) should be interpreted as depreciation. The task then is to estimate the depreciation amounts. Corrosion of buildings and structures is frequently estimated by their replacement cost. This is an imperfect procedure. The correct way would be to estimate the loss in output owing to the corrosion. But that can prove to be hard. As another example, consider that damage to health should be estimated by (a) loss in human productivity, (b) the direct loss in well-being in experiencing pain and discomfort, and (c) reduction in life expectancy. It is fortunate for humanity that good health offers the three benefits more or less as joint products. But to the best of my knowledge, no one has estimated all three losses in studies of the damage environmental pollution causes to human health. The point remains though that there is no reason to distinguish resource management problems from pollution management problems. Roughly speaking, "resources" are "goods", while "pollutants" (the degrader of resources) are "bads". Pollution is the reverse of conservation. The mirror-symmetry between conservation and pollution is well illustrated by the atmosphere, which is both vital for human activity and a sink for pollutants. The atmosphere is a public good (if air quality is improved, we all enjoy the benefits, and none can be excluded from enjoying the benefits). It is also a common pool for pollution. That it is a public good means the private benefit from improving air quality is less than the social benefit. Without collective action there is underinvestment in air quality. In contrast, as the atmosphere is a common pool into which pollutants can be deposited, the private cost of pollution is less than the social cost. Without collective action, there is an excessive use of the pool as a sink for pollutants. Either way, the atmosphere suffers from the "tragedy of the commons".

This paper reviews and in part extends an emerging literature that integrates development and environmental thinking. It focuses on a small part of the literature: economic evaluation, and goes on to develop the notion of sustainable development and construct a unified language for sustainability and policy analyses. It is shown that by economic growth we should mean growth in *wealth* – which is the social worth of an economy's entire set of capital assets – not growth in gross domestic product nor the many ad hoc indicators of human development that have been proposed in recent years. The concept of wealth invites us to extend the notion of capital assets and the idea of investment well beyond conventional usage.

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