IS TECHNOLOGY ALL, FOR SUSTAINABLE DEVELOPMENT?[1]

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One of the most popular and widely accepted definitions (and explanation too) of sustainable development has come from the Brundtland Commission Report:

> "Sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future. Far from requiring the cessation of economic growth, it recognizes that the problems of poverty and under-development cannot be solved unless we have a new era of growth in which developing countries play a large role and reap benefits" (WCED 1987: 40)

The secret of popularity of this concept or the definition of Sustainable Development lies in the fact, it is conveniently optimistic, – not only for developing countries but also for the developed countries. Everybody can continue with economic growth. In the name of enabling developing countries to have economic growth, the developed countries too should have it. This is quite understandable in a globalised world. If New York Stock Exchange sneezes, the whole world catches cold. A recession in USA is bad news for the whole world.

The publication of 'Limits to Growth' idea of Meadows *et al* (1972) shocked the developed countries, no less than the developing. Of course, the developing countries protested more, and the developed countries could hardly suppress their happy smile at this protest. The developing countries said that they needed ecological space to grow; it is the developed countries which brought about ecological crisis though reckless growth, and now they have no moral right to ask developing countries to put limits on growth in the name of avoiding ecological crisis. Fair enough, said the developed countries. You grow, and in order for you to grow, we too shall have to grow. And so the idea of Sustainable Development was born. Yes, all of us shall grow, avoiding ecological crisis at the same time!

How is it possible? Through adoption of right technology, of course! Technological optimism, underlying the Brundtland definition of Sustainable

Development, allows us (or, so we believe) to eat the cake and have it too! It believes that human ingenuity can take care of environmental problems created by economic growth, which, therefore, can be pursued with the same relentlessness as in the past. Yes, there is some historical basis for this technological optimism. The concern for a sustainable use of natural resources was voiced even as early as in the 19th Century England. W S Jevons published a tract on the 'Coal Question' in 1865, though he is better known as a progenitor of neo-classical or marginal school in economics. Jevons expressed the fear that after all coal was an exhaustible resource, on which the industrial development of England relied, and once these resources were depleted, England's industrial development could come to a halt. However, he only suggested discouraging exports of coal, both to conserve local coal resources, and also to limit the industrial development of other countries, so that England could maintain its lead. But Jevons did not integrate his concern for sustainable use in to his economic theory, which was tried to be done much later by Hotelling, though the problem still remains unresolved. The pertinent point here, however, is that the much feared coal shortage and energy crisis did not come about in such a way as to limit England's economic growth. As technological optimists point out, apart from finding substitutes for coal, technology solved similar problems elsewhere too. Technological advance and economic growth have apparently been helping in avoiding the serious political problem of sharing given resources by continuously pushing forward the frontier of known and usable resources. Thus our strategy to meet the problem of scarcity of resources has most often been to shift the supply curve upward, rather than moderate demand. Technological optimists have prevailed upon pessimists, not only because history appears to have been on their side thus far at least, but also because after all it is more pleasing to believe that the economic cake can continuously increase in size, and there is no need to tighten any body's belt.

The double optimism in technology and economic growth resulted in the theory of Environmental Kuznets Curve. According to it, after an initial phase of increasing environmental costs per unit of GNP, they start decreasing at advanced stages of growth. Tariq Banuri has wryly commented on this theory – 'If you torture the data long enough, it will confess' (in Wun' Gaeo ed. 2007: 40). He says this Kuznets curve is a good

example of torturing data long enough until it says 'okay, okay, okay'! This is because the theory is applicable to only certain types of pollutants and major pollutants like carbon dioxide build up and municipal waste are omitted. The theory has been attacked on other grounds too. 'Since the present form of development is unsustainable, it is doubtful if most of the third world countries can ever reach this level of income' (Panth 2007: 288). The earth may be damaged enough irreversibly before such redeeming theoretical levels of income are reached in developing countries. Further, there is nothing automatic about such a benign reversal. Much depends on how seriously governments intervene and meet institutional requirements of such a reversal.

That we have survived ecological problems so far is no guarantee that we shall survive forever. The steeply rising oil prices are only a part of the problem, though hopefully they will shake us out of our complacency. There is already mounting evidence of other monumental environmental problems in the world – climate change and related adverse impacts, fast declining bio-diversity, depleting water resources, building up of toxic residues in the environment, intolerably high levels of noise pollution in major cities particularly in developing countries, and so on. Evidence of adverse impact of these developments on the health of humans, animals and plants alike is also mounting. The incidence of stress, hypertension, cancer, hearing impairment etc, is increasing in developing countries, no less than in the developed. These problems are so serious that we cannot any more take for granted that technology will solve all problems and that no sacrifice, no restraint, on our multiplication of wants is needed. We certainly would need technological advance in going towards an environment-friendly way of living. But we would also need a culture of conservation, and a spiritual attitude that respects nature which can tame our growth aspirations.

I am not against technological development. All that I am saying is that it is hardly enough to solve the problem. Let me illustrate my argument with the example of a patient prone to heart disease. Yes, there are medicines (and technologies) to reduce bad cholesterol. If a blood clot does occur, then are medicines to melt clot, and if that fails, there is the technology of bypass surgery. Yet, the heart specialist does *not* tell the patient

– ‘Don’t worry about anything, eat what you like and how much you like, sit before your TV as long as you like, don’t mind being called a coach potato, don’t have to control your anger and relations of conflict with others, just do what you like. I will prescribe you medicines and if necessary perform surgery on you’. On the other hand, the heart specialist advises the patient to change life-style, to avoid consumption of fatty and junk foods, to exercise, walk and cycle - reducing the use of the car or motor bike. He tells you even to control your mind, your anger, you tensions and anxieties. The heart specialist, who is a technology expert, and practices this technology with faith in it, does tell you that medicines are not all, and surgery has limits. But when it comes to economic growth we forget such constraints of technology and pursue reckless growth, even when it is hostile to the poor in whose name this growth is undertaken, its environmental malignancy apart.

More than merely technological solutions, we would need a religion of environment! This does not mean that we have to give up a rational approach to environment or our faith in the efficacy of technological advance, or even economic growth totally. We will certainly need economic growth to the extent necessary to satisfy the basic needs and comforts of all sections of population. But without having to give up all this, we would also very much need to practice some restraint on our consumption of resources and develop a more reverential attitude to our Earth, the only place we can live in and survive. That is what I call the religion of environment. This religion or this attitude has to be reflected in our day-to-day living, day-to-day working and in all our economic and social activities both at home and outside. Even a small amount of care to switch off lights when we don’t need them, ensuring that we close the tap when not in use, avoiding wasteful or extravagant consumption of water such as through tub-baths and private swimming pools, economizing on the use of paper, taking a shopping bag with us for shopping instead of depending on plastic bags, adjusting the flame to well within the size of the cooking pot, not allowing the flame to burn when the cooking pots or pans are not on the stove, avoiding noise pollution on the streets by not honking – and so many other ways of being careful – can go a long way in taking care of our Mother Earth.

Even in terms of a purely economic approach, technological optimism would need some amount of temperance, or moderation. We need a mini-max approach to ensure our survival, an approach which chooses that strategy among alternative outcomes which involves the least loss or disaster, taking in to account maximum possible loss from each strategy. Such an approach has long been recognized by economists as useful in dealing with similar problems. Though well known to professional economists, it bears reiteration here, as set out in the Box here.

Box : Outcomes in Terms of Loss

Strategies in relation to environment	Optimists are right	Optimists go wrong	Maximum Loss
Indifferent	0	- 10 X	- 10 X
Benign	- 2 X	- 4 X	- 4 X

X is Units of Loss

The Box presents illustrative outcomes in terms of loss (of, say, national income or collective welfare presumably measured in some way) from pursuing two alternative strategies of economic growth,- the first is indifferent to environmental considerations (in practice, may not be so in words), and the second is benign or considerate to environment (again, in practice). Two alternative situations may arise, one where technological optimists are right and the second where they go wrong. The Box presents outcomes under each strategy and each possible situation. What would be the best strategy under the circumstances? I think most would choose the environmentally benign strategy as it minimizes the maximum loss, unless one is an incorrigibly pathological gambler. But we cannot afford to gamble with our precious Earth and put at risk the lives of millions of people, for the sake satisfying the whims of a few elite.

It is time we debunk the claimed omnipotence for technology and see it in a more realistic perspective. Though technological advance has helped us in the past to overcome the resource crunch, we also know that it has not been fast enough to cope with accumulating environmental problems. There are significant lags between emergence of environmental problems and development of technologies to alleviate them. There are further lags between development of technologies and their application on a wide scale in

all problem areas. It takes time to create conditions where technology can work. But in the meanwhile, environmental degradation accumulates often in irreversible ways, so that it is difficult to undo the damage done.

Why does technological development lag behind accumulation of environmental problems? First, because detection of the emergence of environmental problems takes time, and even when detected, their enormity and implications are not realized in time. Wishful thinking often comes in the way. This is what happened in the case of climate change. This is what is happening in the case of depletion of water resources, and in so many other cases. Secondly, the emergence and spread of environmental problems does not need the market; they take place outside the market process, though eventually they are bound to have an economic impact. But the implementation of technological solutions has to be in a market framework. A solution even if technically feasible has to be economically viable. Even when environmental costs are reckoned in economic terms, they may be ignored so long as they are not felt in the market, i.e., so long as they are not economically internalised. A technological solution needs proper economic incentives and disincentives, high enough to prevent adverse environmental impact. These are not easily accepted. For example, energy taxes have been proposed for a long time now, but hardly implemented. Thus a solution may be deferred or even rejected, if it is felt to be too costly. That is why doctors always emphasise that prevention is better than cure and that life style changes are much less costly.

There is a grave distributional implication also to this economic-environmental dimension. That is when the rich grow and create environmental problems, while the poor have to bear their burden or impact. This is generally the case both within a country and between the countries. Toxic wastes may be created by the rich, which are dumped among the poor, leaving them to suffer from the side effects. Forests may be exploited for profit by the rich, but in the process the poor forest dwellers may lose their livelihood. Hills may be ripped open by rich miners, but the erosion may destroy fields and tanks below, pushing the farmers out of their occupation. Many such examples can be given. But the common story with them all is that the exploiting rich do not feel the urge or

motivation to solve the problem, because it is not faced by them but by the poor. Where the costs are borne by future generations, the problem is graver still.

Technology has other important limitations too. It can give partial solutions and cannot address itself to overall and general scarcity of resources. Daly explains:

> 'As we attempt to recycle more and more of our produced goods, we will reach the point of diminishing returns; the energy expenditure alone will give rise to a ruinous amount of waste heat and thermal pollution. On the other hand, if we recycle too small a fraction of our produced goods, then non-thermal pollution and resource depletion become a severe problem' (Daly 1980: 181).

As Daly says further, we can probably choose between the two depending on which of them is more efficient, reckoning environmental costs too. Yet, the hard reality is that such a choice does not enable us to have continuously increasing rates of material and energy consumption in the long term too. An interesting example in this context is the solution in terms of replacing incandescent bulbs by CFL lamps as energy saving device. Enthusiasts have even asked for a ban on the production and sale of incandescent bulbs. It is true that CFL technology saves electricity, but it is not without problems especially if there is a ban on in incandescent bulbs. Such a ban will put many rural and even far flung urban areas at a disadvantage as they normally have a low voltage problem most of the time and CFL lamps do not then work. Besides, disposal of waste CFL lamps requires special care as they contain toxic elements like mercury.

Sometimes, the cure offered by technology can be worse than the disease. This is particularly when technological solutions have serious social costs. For example, as Magdoff (2008:3) observes, 'producing corn to make ethanol or soybean and palm oil to make diesel fuel is in direct competition with the use of these crops for food'. In the process of developing a substitute for petroleum, we cannot afford to create food insecurity for the poor. Similar is the story of growing pulpwood plantations in the name of carbon sequestration, which deprive the villagers of their grazing lands. Such examples suggest that social and distributional implications of technological solutions have to be carefully studied before their large scale implementation

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Even where acceptable, technological solutions have institutional requirements or conditions, without which they cannot be implemented. The right kind of institutions including developing the required legal framework has to be in place for the purpose. For example, segregation of municipal waste in to wet (decomposable), dry (non-decomposable), chemical and hazardous categories, is hardly done, resulting in inadequate and inefficient waste disposal, and posing health hazards. We have the technology for treatment of municipal and industrial effluents, but the major rivers in including those considered sacred like the Ganga and Jamuna in India have remained highly polluted. The institutional constraints on technological solutions have remained challenging and almost intractable issues in India, in spite of more than 200 pieces of environmental legislation and huge institutional structures developed for implementing them (like the Pollution Control Boards). This is not to say that no progress has been achieved. But it has been inadequate and tardy, compared to the fast growing environmental problems.

If a collapse of the Earth's eco-system has not been reached so far in spite of the extremely high rates of consumption of the rich, it is not so much due to technological advance as due to the appalling sacrifice on the part of the poor in the World. This is as true within countries, particularly the developing countries, as it is between countries. The elite within developing countries are no angels, and contribute to the decimation of the earth's resources as much as the elite in the developed countries. The poor form the bulk of World's population who are in no position to deplete and pollute, as they do not have the economic wherewithal to do so. But their deprivation cannot hold the balance of the world's eco-system any longer. Being impatient with inequity, they would strive to attain the same levels of consumption as the rich. Thus, inequity - even as it appears to have prevented an ecological collapse so far - holds the promise of hastening it.

It is in this context that the Hindu-Buddhist attitude to development becomes relevant. Hinduism and Buddhism do not authorise human beings to lord over the Earth

and exploit it in a whimsical, selfish and anthropocentric manner. It advises humans to enjoy the world and their life, but within reasonable limits that do not disrespect the Earth itself. Humans can satisfy their wants but should also control greed. Mahatma Gandhi's famous saying that the Earth has enough to satisfy our needs but not our greed, sums up our predicament. Relentless and unscrupulous pursuit of wealth could not be the goal of human development. If we seek human development based on satisfying needs rather than wants, as C T Kurien put it (1978: 46-50), it may even help spiritual fulfillment and promote amity apart from making the development process sustainable within the limits of Earth's resources.

It is easy to brush aside all these uncomfortable thoughts by observing that environmental costs are inevitable in any development-cum-urbanization process. But there should be ways in which human welfare can be advanced without involving violence to nature, without ecological costs. Forest development projects involving non-timber forest produce constitute one such way, which have shown the potential of increasing the incomes and employment of particularly the rural poor. Projects for improving inland and marine fisheries, and rejuvenating tanks and rivers also have similar effects. Creating separate lanes for bicycles on roads and promoting public transport, while at the same time discouraging private transport, can improve the health of urban dwellers in several ways, along with improving urban environment. There ought to be more ecological and economic space for such solutions.

Development based on advancement of knowledge, culture, literature and arts is another environmentally benign way. An important dimension of human welfare consists in ensuring that humans have enough leisure of their own in which they can advance their knowledge, and enjoy art, literature and music and be more cultured. They should also have some time to reflect on the world and on one self. Otherwise, creativity will die in a hectic over-busy world. It is senseless if human beings have to work all the while for earning livelihood by producing more and more of material goods. What is the use of a few talented persons producing culture goods, if others have no time to enjoy them? Every human being should have some leisure, which she can enjoy. But this

leisure should be voluntary, not forced. Bertrand Russell's *In Praise of Idleness* was published as early as in 1935. It has become more relevant today than ever before. More than cancer, stress and tension are taking a heavy toll in today's world, even among women. Productivity has increased enormously thanks to labour saving devices. This should have resulted in giving more leisure to employees, producing more with least wastage of both human and material resources. Russell, however, found the reality to be otherwise. There is forced idleness on the one hand, and on the other hand there are employees working harder than they should have; there is also surplus production which is more than necessary to satisfy human needs (and even wants), with a lot of resources wasted on marketing the surplus production. Russell observes:

> 'In a world where no one is compelled to work more than four hours a day, every person possessed of scientific curiosity will be able to indulge it, and every painter will be able to paint without starving… Above all, there will be happiness and joy of life, instead of frayed nerves, weariness, and dyspepsia. … Modern methods of production have given us the possibility of ease and security for all; we have chosen, instead, to have over work for some and starvation for others. Hitherto we have continued to be as energetic as we were before there were machines; in this we have been foolish, but there is no reason to go on being foolish forever'. (Russell 1960: 20-1).

This has happened because we have viewed development mainly in terms of growth of GNP, not in terms of welfare. Our obsession with growth is so strong that even a process of growth, which creates little or no jobs but generates a greater rate of growth of GNP, is preferred to a process of growth that generates more jobs but a lower rate of growth of GNP. The welfare aspect of growth is totally ignored here. Even if welfare is taken into account, at least unconsciously it is taken as the welfare of elite and the middleclass, rather than the welfare of all. Mahatma Gandhi and Vinoba Bhave (one of Gandhi's foremost spiritual disciples) viewed welfare in terms of *Antyodaya*, that is, the welfare of the marginalized and the down trodden. Knowledge, freedom, good health, opportunity for creativity and realizing oneself as a cultured human being, and above all time to take delight in the joy of living in this beautiful world, for all and not just for a chosen few, – they are all part of welfare and hence development. It is this holistic

development, which is consistent with our spiritual and moral development, and not a relentless rat race.

The need for such a holistic view of development brings us to Amartya Sen. Development has to be essentially humanistic development, transcending '*Commodities*' and promoting '*Capabilities*' – using his words. Sen questions the usual emphasis on judging one's well-being in terms of the person's *opulence* or in terms of what one *has* (possessions or physical assets), and proposes an alternative approach in terms of what one can do or *be* (Sen 1999). At one stroke, Sen has thus reconciled economic development not only with ecological sustainability but also with spiritual development.

Though this type of holistic development can be said to owe its inspiration to Hindu-Buddhist world-view, it is not necessarily exclusive to these two religions. It can be consistent with other religions too, and also with ethics in general freed from religions trappings. Ultimately, no single religion can be a rallying point for the cause of environment and humanistic development. Instead, we have to draw inspiration for it from all religions and also from modern secular humanistic values.

In striving to achieve this holistic-humanistic development, not only the individual but also the civil society has to play an important role. The present process of development, which relentlessly pushes nature under the heels of the market process, cannot be countered by isolated individuals, however much imbued with a 'religion of environment'. Not that the individuals are not important, but they will have to build environment-friendly associations of the like-minded, and initiate collective social action to be more effective. There is no need for violence as instrument of social action. M K Gandhi showed both in South Africa and then in India that non-violence can be a much stronger force even in bending a most determined state. Now there is a need for a mass movement all over the world in favour of sustainable development, and against reckless commercialization of Nature. This is because in the long run, reducing Nature to the status of a marketable commodity is sure to decimate all humanity.

The relevance of the civil society arises precisely because unfortunately the states all over the world have tended to become subordinate to the market process, instead of dominating the market and correcting it. This has become evident particularly in the globalization era. There is a real danger that the states may slip away from the democratic control of citizens and the civil society, and become a handmaid of the market in the name of relentless pursuit of economic growth. It is here that a civil society has to assert itself both in the cause of real human welfare and survival of Nature. This is not a technology problem. It is a social and a political problem. Social scientists can play a significant role not just in studying social processes, but may be, even in guiding them and in strengthening civil society.

NOTES

1. This is a little enlarged version of the paper presented at the NRCT-ICSSR Seminar on Sustainable Development at Bangkok on 22nd and 23rd of May, 2008. The paper grew out of Chapter 7 ('Hindu Approach to Development') in the author's book (Nadkarni 2008). The Seminar papers, as finalized, were brought out together by NRCT and ICSSR subsequently.

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