

The Environment-poverty Nexus

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The environment-poverty nexus encompasses a variety of social and political as well as economic factors that obstruct the achievement of the MDGs. The nexus is also freighted by a number of myths that implicitly discriminate against the poor and threaten environmental sustainability, one of their major resources in today's world.

In 2002, the World Summit on Sustainable Development (WSSD) looked closely at the linkage between sustainable development and achieving the MDGs. If sustainable development can be defined as a development path and pattern in which the choices of the present generation are enlarged without restricting the choices of future generations, the concept implies three issues:

- Enlargement of human choices at any point would depend on economic, political, social, institutional and environmental contexts. Thus sustainability encompasses more than environment.
- The concept of sustainability is a dynamic intergenerational notion.
- The abstract concept of sustainable development needs to be operationalised, which requires, among other things, measurable indicators and quantifiable targets, a framework for inter-temporal cost-benefit analysis.

Development becomes sustainable if it is pursued on several fronts – the political, social, economic, and environmental. And it is the interaction of policies and outcomes in all these dimensions that makes sustainability real.

- *Political sustainability* encompasses reproducibility of power structures and governance mechanisms, along with the evolution of institutions and the institutional framework that would carry out the tasks ensuring that the present generation maximises its choices but not at the cost of opportunities for future generations.

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- *Social sustainability* reflects social norms, values and culture, social structures and social cohesion, which are conducive to ensuring enlargement of choices of all segments of society in an equitable manner. If development is to be sustainable, it has to be owned by the entire society in terms of its philosophy, modus operandi and direction. Such ownership will facilitate the commitment to, and understanding of the need for, not compromising the opportunities of future generations while undertaking development for the present time.
- *Economic sustainability* addresses economic production and distribution as well as reproduction of the population. Economic sustainability requires building of human capabilities in an equitable manner through universal access to basic social services, equal economic opportunities, fairness in access to productive resources, sustained economic growth, etc. Thus equity, sustained growth and quality of life are three major dimensions of economic sustainability.
- *Environmental sustainability* deals with natural resources — exhaustible and renewable — and ecosystem services and the reproducibility of global ecosystems services and ecological resources. The overuse of natural resources and environmental degradation shrink the opportunities of future generations. Environmental sustainability emphasises the proper use of natural resources and regeneration of the ecosystem so that future generations have the same opportunities as the present ones.

Sustainability is thus linked to all forms of capital — natural, economic and social — and their reproduction. Natural resources and their reproduction are the key to environmental sustainability. Economic capital, e.g. labour and its reproduction, is needed for economic sustainability and social capital, i.e. cohesion, interaction and relationships among human beings within a society, is also a prerequisite for sustainability.

Throughout the 1990s, there were a series of global conferences on various aspects of sustainable development. The themes of these conferences covered a range of issues — education, children's concerns, population, social development, human rights, human settlement, and gender issues. Some of these conferences set qualitative targets, some quantitative ones in their relevant areas. In the mid-1990s, drawing from all these, a set of International Development Goals (IDGs) was proposed — which were first adopted by the OECD/DAC in 1996. All these initiatives were consolidated and given a new momentum at the UN Millennium Summit in September 2000. At that Summit, 149 Heads of State and representatives from some 180 countries adopted a set of goals — known as Millennium Development Goals (MDGs) — to overcome basic human deprivation around the world. The goals are time-bound, to be achieved by 2015, with the base year of 1990. A look at these goals immediately confirms that human poverty is at the centre of the MDGs.

Sustainable development reflects a broad-based concept, which sometimes lacks operational specificity. The MDGs, being time-bound quantitative targets in many areas of sustainable development, help concretise the notion. If the world can halve extreme poverty, adequately feed people, ensure universal access to safe water, reduce child mortality and maternal mortality by two-thirds and three-fourths respectively, can enrol all its children in school, can reverse environmental degradation and the spread of HIV/AIDS, it will ensure sustainable development.

On the other hand, to achieve the MDGs, a country will need political, socioeconomic and environmental sustainability. For example, legal discrimination towards certain groups in society that precludes them from having access to safe water will make the goal of halving the proportion of people without access to safe water by 2015 difficult, if not impossible. Persistent gender discrimination can also put several MDGs beyond reach of the society. Unequal access to productive resources will hold back a society from achieving the goal of halving extreme poverty. Systematic environmental degradation in any society would prevent it from reaching the goal of reversing loss of environmental resources.

Sustainable development and achievements of the MDGs are thus mutually reinforcing. They represent a two-way relationship – where achievement of the MDGs helps achieving sustainable development and where the presence of sustainability in its various dimensions is needed for achievement of the time-bound global goals.

The path towards sustainable development and achieving the MDGs is not a smooth one. Several current trends are acting as major constraints to sustainability and as such are having an adverse impact on the process of achieving the MDGs. These constraints are:

- *High inequality*: Inequality takes many forms – in terms of access to basic social services or productive resources, in terms of income, in terms of human development outcomes, in terms of regional, rural-urban differences, between borders and between socioeconomic groups. There are certainly overlaps and mutual reinforcements of various dimensions. For example, gender disparity may be aggravated by rural-urban disparity and also by ethnicity. Thus a rural woman belonging to a minority group may face the highest degree of disparity – first because of her sex, second because of her location and third because of her ethnic identity.

Whatever lens is used to look at inequality, it can be concluded that even though progress has been made in a number of areas, disparities persist in many aspects of sustainability. In the mid-1990s, the poorest 10% of the world's people had only 1.6% of the income of the richest 10% (UNDP, 2001). Serious

disparities exist in areas of access to social services, productive resources, and energy services. In the developing world, productive resources are predominantly controlled by the rich, economic opportunities mostly go to ethnic majorities and the access of rural people to basic social services is still a fraction of that in urban areas.

Access to cleaner and efficient energy services is a critical element for overcoming poverty and also for ensuring environmental sustainability. But poor people in the developing world are at the bottom of the energy ladder, burning dung, wood and crop residues for their cooking and heating. They are without access or have lesser access to cleaner and efficient energy services, such as kerosene, propane, biogas and electricity. About 2 billion people in the developing world are without electricity and nearly 70% of energy use in Sub-Saharan Africa comes from traditional sources (DfID et. al., 2002).

Inequality in access to social services, productive resources and energy services result in unequal outcomes. A majority of the more than 2 million annual deaths from indoor pollution are poor people. In Canada, the life expectancy of an Inuit male is 58 years, 17 years less than that of all Canadian males. In Nepal, the adult literacy rate at 24% among the Untouchables is less than half of that of 58% among the Brahmins (UNDP, 2001). Many other examples can be added covering nearly all countries.

Such widespread disparity in different planes has implications both for achievement of the MDGs as well as for sustainable development. When there are pockets of intense deprivation, efforts and strategies need to focus more on those areas to achieve overall goals within stipulated time periods. It is therefore important to identify such pockets and to channel focused efforts towards them. Similarly, the existence and perpetuation of inequalities and disparities in various dimensions are the root cause in most circumstances for frustration, discontent, mistrust and conflict – all major constraints to sustainability. Policies are thus needed up front to deal with such disparities so that conflicts, wars, terrorism and failed states are avoided down the road.

- *Gender disparity*: Any development that bypasses half of humanity cannot be sustainable. Even though progress for women is manifest on several fronts, the discrimination against women remains universal. In the developing world, female enrolment lags behind male enrolment at all levels. In most countries, women's wages are significantly less than those of men. Women continue to be discriminated against in political life, which is still dominated by men. Worldwide, women constitute less than 10% of the legislators.

Gender disparities are also evident in outcomes. Half a million mothers die every year in childbirth, that is one every minute. Of the 854 million illiterate adults, two-thirds are women. Nearly 80% of more than two million annual deaths from indoor pollution are women and girls (UNDP, 2002a).

Women are the major victims of domestic violence, rape, genital mutilation and cross-border trafficking for prostitution. Around the world, the percentage of women experiencing violence in an intimate relationship varies from 10% to 70%. About 1.2 million women and girls under 18 are trafficked every year for prostitution (WHO, 2002). Such systematic violence against women is a major constraint to any kind of sustainability.

- *Social exclusion:* Even though in recent years, people's participation has increased on many fronts and the value of people's power has been demonstrated, a process of exclusion persists in many parts of the world. Social exclusion acts at several levels. At one level, ethnic minorities, races or religious faiths, tribal and indigenous peoples, people belonging to lower castes are excluded from the mainstream activities and benefits of many societies. At another level, women and children, people who are elderly or disabled or people with different sexual orientations are also discriminated against. Yet at the third level, people who are economically depressed also cannot take part in the processes that affect their lives. All these are often reflected in unequal human outcomes.

But more importantly, they are reflected in some extreme outcomes. Today, worldwide, there are more than 17 million people who are either refugees or internally displaced (UNDP, 2002a). Displaced from their land, deprived of their livelihoods, these people face extreme social exclusion. In many parts of the world, xenophobia is on the rise.

Ethnic minorities and races in many societies are not only excluded from the mainstream of society; they are the victims of genocide. Genocide occurred in Europe and Africa, with 200,000 people killed in Bosnia in 1992-1995 and 800,000 killed in Rwanda in 1994 (UNDP, 2002a). Social and political forces frequently work against women, ethnic minorities, and people with disability.

Some of the exclusions occur due to economic forces. For example, the opening up of markets can erode the security and social safety nets, thereby excluding the elderly, children and others from the social protection system. During financial crises, poor people often become excluded from the system.

Social exclusion adversely affects sustainable development in three distinct ways. First, it denies the potential of groups of people to significantly con-

tribute to the development process. Second, it excludes people from participating in the decisions that affect their lives. Third, it raises the fear of human insecurity among affected groups. All these denials and exclusions make the achievement of MDGs difficult.

- *Critical issues of the 1990s:* Apart from the issues mentioned above, some critical issues primarily emerging in the 1990s, such as HIV/AIDS, debt, conflict and terrorism, are additional constraints to sustainable development, as well as achievement of MDGs, in different parts of the world, particularly in Sub-Saharan Africa.

About 40 million people are living with HIV/AIDS, not counting the 28 million who have already died of the disease. More than 70% of those affected today are in Sub-Saharan Africa. HIV/AIDS is not a health problem; it is a development issue (UNDP, 2002b). Thus apart from its adverse impact on longevity and mortality, it also affects education, human resources, labour supply and employment, agricultural production, earning capacity and economic growth. MDGs cannot be achieved and development cannot be sustainable unless the issue of HIV/AIDS is tackled urgently.

The total external debt of the developing world exceeds \$2 trillion. By 1996, the total debt of the 41 heavily indebted poor countries (HIPC) was more than \$245 billion and they were spending more than \$11 billion a year for debt servicing. In countries like Angola, Guyana and Nicaragua, debt servicing as a percentage of GNP exceeded 20%, while their expenditure on health and education, as a percentage of GNP was less than 5% (UNDP, 1999). With such huge resource outflows for debt, there may not be enough resources to even initiate growth and human development, not to speak of their sustainability. Relief provided under the HIPC process has been significant in some countries, but may only be temporary.

Conflicts are frequent; most of these conflicts are intra-country, rather than inter-country. In the 1990s, nearly 4 million people, the majority of whom are minorities, were killed in wars within states. Half of all civil casualties are children and there are an estimated 300,000 child soldiers worldwide (UNDP, 2002a). Conflict breeds unsustainability.

Inequality, social exclusion, and conflicts slowly create a situation that leads to terrorism. The world today faces such a situation. Terrorism by its very nature brings instability into the system. In the coming years, terrorism may be a major challenge to sustainable development.

These constraints reflect challenges to various dimensions of sustainability. For example, high inequality is a major challenge to economic and social sustainability; and social exclusion to political and social sustainability. These constraints do not operate in isolation; rather they reinforce each other. For example, gender disparity and social exclusion are highly correlated, and conflict and terrorism may reinforce each other. The interactions of these constraints add more to various dimensions of unsustainability and the constraints themselves are reinforced by the underlying structures and dynamics of these dimensions.

The Environment-poverty Nexus : an overall perspective

Since environmental sustainability is a key dimension of sustainable development and poverty reduction is the core of the MDGs, in order to properly understand the sustainable development-MDG linkage, it is essential to grasp the environment-poverty nexus. A review of the environment-poverty nexus starts with a short review of analytical relationships of poverty and environmental conditions, including a brief quantitative account of the impact of environmental degradation on poor people. It then moves on to deconstruct some specific environment-poverty myths. It also re-examines some of the conventional wisdom on the environment, growth and poverty nexus.

Relationships between environment and poverty

The environment-poverty nexus is a two-way relationship. Environment affects poverty situations in three distinct dimensions : by providing sources of *livelihoods* to poor people, by affecting their health and by influencing their vulnerability. On the other hand, poverty also affects environment in various ways: by forcing poor people to degrade environment, by encouraging countries to promote economic growth at the expense of environment, and by inducing societies to downgrade environmental concerns, including failing to channel resources to address such concerns.

Environment matters a lot to poor people. Their well-being is strongly related to the environment in terms of, among other things, health, earning capacity, security, physical surroundings, energy services and decent housing. In rural areas, poor people may be particularly concerned with their access to and control over natural resources, especially in relation to food security. For poor people in urban areas, access to a clean environment may be a priority. Prioritisation of environmental issues may vary across different social groups. For example, poor women, reflecting their primary role in managing the household, may regard safe water, sanitation facilities, and abundant energy services as crucial aspects of well-being for poor people.

Some of the environmental degradation reflects truly global concerns, such as global warming and the depletion of the ozone layer. Some is international, like acid rain, the state of the oceans, or the condition of rivers that run through several countries. Some is more localised, though it may often occur worldwide, like urban air pollution, water pollution, or soil degradation. Even though poor people also feel the impact of global environmental degradation, it is local environmental damage that affects the lives of poor people more.

The impact of environmental degradation is unequal between the poor and the rich. Environmental damage almost always hits poor people the hardest. The overwhelming majority of those who die each year from air and water pollution are poor people. So are those most affected by desertification and by the floods, storms and harvest failures brought about by global warming. All over the world, it is poor people who generally live nearest to dirty factories, busy roads and dangerous waste dumps. The loss of biodiversity is most severe for poor rural communities. Environmental degradation, by depleting the health and natural support systems of poor people, may make them even more vulnerable.

Box 1 provides some quantitative estimates of the human impact of environmental degradation in the developing world. Because of the nature of the degradation, it is poor people in general who bear the brunt of this impact and with the poorest bearing the hardest burden. Impoverishment pushes them to the most ecologically fragile lands; they are at the bottom of the energy ladder and they are nearest to toxic dumps. Women also bear a disproportionate burden. Since mostly women and girls in developing countries stay indoors for cooking and other household work, they constitute 80% of the 1.8 million deaths from indoor pollution. The effect of biodiversity loss is the most severe for indigenous people, as they depend more on biodiversity for their livelihoods, energy, and medicine.

BOX 1: IMPACTS OF ENVIRONMENTAL DEGRADATION IN THE DEVELOPING WORLD

- Water-related diseases, such as diarrhoea and cholera, kill an estimated 3 million people in developing countries, the majority of whom are children under the age of five.
- Vector-borne diseases such as malaria account for 2.5 million deaths a year, and are linked to a wide range of environmental conditions or factors related to water contamination and inadequate sanitation.
- One billion people are adversely affected by indoor pollution.
- Nearly 3 million people die every year from air pollution, more than 2 million of them from indoor pollution. More than 80% of these deaths are those of women and girls.
- Nearly 15 million children in Latin America are affected by lead poisoning.
- As many as 25 million agricultural workers – 11 million of them in Africa – may be poisoned each year from fertilisers
- More than one billion people are affected by soil erosion and land degradation. Some 250 million people are at risk from slash crop yields.
- Desertification already costs the world \$42 billion a year in lost income.
- Over the last decade, 154 million hectares of tropical forests, covering almost three times the land area of France, have been lost.
- About 650 million poor people in the developing world live on marginal and ecologically fragile lands.

Source : UNDP (2002, 2000 and 1998)

Deconstructing some specific environment-poverty myths

- *“Poor people are the principal creators of environmental damage.”* Not true. Even though poor people bear the brunt of environmental damage, the irony is that they are not its principal creators. It is the rich who pollute and contribute most to global warming. They are the ones who degrade the global commons, making resources scarce for poor people. In many areas, the non-poor, commercial companies, and state agencies actually cause the majority of environmental damage through land-clearing, agro-chemical use, and water appropriation. The rich also generate more waste and create stress on nature’s sink. Thus poor people become victims of the consumption levels and patterns of the rich.

The per capita emission of CO₂ in the developed world is 11 metric tonnes per year, compared to 2 metric tonnes in the developing world. The continent with the greatest share (74%) of dry land suffering from moderate to severe desertification is North America. In the Philippines, during the Marcos regime, 50% of the forest was lost to commercial logging – a few hundred families shared \$42 billion in revenue, leaving 18 million forest dwellers impoverished (UNDP, 1998).

One of the environmental challenges that stem from growing poverty and environmental damage is that it pushes more and more people to the periphery – to the most ecologically fragile land where they become even more vulnerable. Yet there are many examples in which poor people take care of the environment and invest in improving it.

- *“Population growth leads to environmental degradation.”* There’s no necessary correlation. While initially degradation may occur as population increases, what happens next is context-specific. Rapid population growth is not incompatible with sustainable management of the environment and in some cases, as has been demonstrated in the Machakos experience in Kenya, increasing population density is required for environmental sustainability.

Until the late 1930s, significant soil degradation and erosion – a large-scale population-induced degradation — have been observed in the district. Between 1932 and 1990, the population of Machakos increased from 240,000 to 1.4 million. The population growth affected the situation positively in two ways. First, the concern about soil degradation led to such measures as bench terracing to conserve soil. In the 1950s more than 40,000 hectares of land were terraced and in the 1980s more than 8,500 kilometers of terraces were constructed annually. Second, increasing population density leading to land scarcity promoted investment, both in conservation and in high-yielding improvements. Integrating crop and livelihood production improved the sustainability of the farming system. Many social and institutional factors – a good policy framework, better physical infrastructure,

a secure land tenure system, indigenous technology, an improved health and education system – facilitated the agricultural change in the Machakos district. The results have been impressive. Between 1930 and 1987, the productivity of food and cash crops increased more than six-fold. Horticulture productivity grew four-fold (Montimore and Tiffen, 1994).

The Machakos experience clearly demonstrates that even in an area vulnerable to soil degradation, a large population can be sustained through a combination of endogenous and exogenous technological change supported by a conducive policy framework and much local initiative.

- “*The poverty-environment nexus basically stems from low incomes.*” It’s not that simple. Arguments that maintain that poor people degrade the environment basically explain the poverty-environment nexus in terms of income levels only. The poverty-environment nexus is more complex. Questions of ownership of natural resources, access to common resources, the strength or weakness of communities and local institutions, the way information about poor people’s entitlements and rights to resources is shared with them, the way people cope with risk and uncertainty, the way people use scarce time – all these are important in explaining the environmental behaviour of poor people.

Many of the natural resources that are degraded are communal property. Rights are ill-defined, often because they were originally defined within a local social and political framework that is no longer there. Institutions for managing common property that reflect the consensus of owners and can control use are lacking. In ecologically fragile ecosystems, people tend to minimise risks, not maximise output, whether they are poor or rich. Over-exploitation of sources of fuel-wood is linked more to the time available to women than to their poverty status. There is a gender dimension, but not necessarily an income dimension.

Many factors shape human behaviour towards the environment, some related to poverty or affluence, others independent of either income or poverty.

Revisiting conventional wisdom in the environment-poverty nexus

- *Downward spiral hypothesis:* The hypothesis maintains that poor people and environmental damage are often caught in a downward spiral. Past resource degradation deepens today’s poverty, while today’s poverty makes it very difficult to care for or restore the agricultural base, to find alternatives to deforestation to prevent desertification, to control erosion and to replenish soil nutrients. People in poverty are forced to deplete resources to survive, and this degradation of environment further impoverishes people (Ostrom et. al. 1999).

While this can and does happen, as an overarching model, it is a rather simplistic view of a much more complex reality. Environmental degradation can sometimes be associated with poverty, but there is not necessarily a direct causal relationship. Other factors also shape human behaviour to the environment. The danger of the Downward Spiral Hypothesis is that it may often lead to policies that either reduce poverty (often in the short run) at the expense of the environment or protect the environment at the expense of poor people.

- *Environmental Kuznets Curve.* The Environmental Kuznets Curve shows a relationship between air pollution and economic growth. It maintains that pollution will increase initially with economic growth, but if growth continues and as society becomes more affluent, pollution will be reduced. Thus, by measuring economic growth in terms of per capita income in an economy, it establishes an inverted U-shaped curve implying increases in pollution initially, but a decline as per capita income continues to grow.

The Environmental Kuznets Curve has been severely criticised on conceptual, statistical as well as policy grounds (Banuri, 1998). Conceptually, an inverted U-shaped relation may exist between a few selected pollutants and income, but not necessarily at an aggregative level. In the area of statistics, there are the problems with aggregation, with identification of appropriate variables, and from weakness of the data. Evidence indicates that there is nothing inevitable about the link between economic growth and environmental degradation. In fact, policies and institutions can significantly influence the Environmental Kuznets Curve. The removal of perverse subsidies, the internalisation of externalities and the identification of property rights can change the relationship between income levels and levels of environmental degradation.

- *Beckerman Hypothesis.* The hypothesis maintains that as growth provides accumulated assets that can be used to ameliorate environmental degradation, it makes sense to degrade now and pay later to put things right.

There are three major problems with this hypothesis (Munasinghe and Cruz, 1995). The first one is that economic growth can generate accumulated assets, but there is no guarantee that a part of such resources would be used to ameliorate environmental degradation. Such resources, as experience has shown, might have been used for other purposes, sometimes for unproductive ones. Second, like the Environmental Kuznets Curve, the Beckerman Hypothesis also seems to undermine the need for conscious policy interventions. It indirectly implies that growth would provide accumulated assets that would take care of environmental degradation. Third, it takes a simplistic approach towards the intergenerational equity issue. It basically says that there will be physical degradation at present, but that

monetary compensation will be made in future, without answering how this would provide the same sort of opportunities as those enjoyed by the present generation or how compensation would be translated into physical natural resources or how the amount and the nature of future compensation are agreed upon.

- *Porter Hypothesis*: Porter argues that high levels of environmental protection are compatible with high levels of economic growth and may encourage innovation that supports growth. The hypothesis makes two fundamental points. First, environmental protection is justified not only for pure environmental reasons, but because such protection makes economic sense as well. Environmental protection by ensuring minimising waste of resources, by enhancing efficiency in resource use and by minimising adverse environmental externalities of the production process, may contribute positively to economic growth. Second, if people see the economic value of environmental protection, initiatives may be undertaken for innovations in technology, input-mix, and management to increase resource-use efficiency and also to minimise resource waste and the adverse environmental impact of production. All these enhance economic growth further (OECD, 2001).

But the hypothesis can lead to an extreme situation whereby environmental standards are imposed on trade. Using trade restrictions in the name of environmental standards is protectionism. For domestic environmental problems, such restrictions are inefficient; for transboundary problems, they are both inefficient and inequitable.

Both for poverty reduction and environmental sustainability, economic growth is critical. Such growth must be pro-poor and resource-saving, in order to contribute to those two objectives. Efficiency in resource use is crucial on two fronts: first, it releases resources that can be devoted to poverty reduction; and second, it reduces environmental degradation.

Delinking economic growth and natural resource use

If it becomes possible to use less and less natural resources in the production process, it would mean *dematerialisation* of the production process and would imply delinking natural resources from economic growth. Studies have shown that resources can be used at least four times as efficiently as they are currently. Looking at the total impact of human interference with the biosphere, experts have concluded that material turnover should be reduced by at least 50% on a global scale. Since per capita resource use is five times greater in industrial countries than in developing countries, it has been asserted that sustainable levels of material flows will not be reached unless the material intensity in industrial countries is reduced by a factor of ten.

The critical issue with regard to delinking is not to establish its advantages, but to face the practical question as to whether such a delinking is possible. There is historical evidence that it is possible in many areas. Between 1791 and 1830, the volume of coal used to produce one tonne of iron was reduced by over 50%. It has been shown that industrial countries could continue their present growth rates and yet reduce their energy use by a third.

Technology has played a major role in the delinking process. Increases in productivity and efficient use of resources because of technological development have made it possible to get the same amount of output with lesser amounts of inputs. In a survey of four major materials such as cement, steel, copper, timber covering 11 countries (eight being industrial), the elasticity of material use to economic growth has been found to be zero from 1970-85, implying a delinking phenomenon. Per capita use rates of steel, timber, and copper have generally stabilised or even declined in industrial countries.

Recycling also had an impact on the dematerialisation process. It reduces both the demand for primary resources and many of the adverse environmental impacts associated with waste disposal. Every tonne of iron recycled not only replaces a tonne that would have been mined, but also avoids several tonnes of hidden material flows associated with iron mining and processing. Recycling can also save energy: recycled aluminum requires only 5% of the energy needed to refine and smelt new aluminum from bauxite. Today in industrial countries, the recycling rate for paper is about 45% and for glass 50%, compared with 33% and 26% respectively in the mid-1980s. Recycling is yet to be of significance in developing countries. There are instances where private action in developing countries, particularly by women, has been quite successful. On the one hand, it has become a flourishing business and, on the other, it has contributed to the solution of waste disposal problems. However, recycling is not always environmentally benign, particularly where hazardous recyclable wastes are involved.

Some concerns have been raised on various aspects of delinking. First, it has been argued that evidence of declining material intensities is restricted to certain specific materials. The issue is whether it can be generalised as a reflection of an aggregative picture in the production function. Second, in recent years, industrial countries are taking a large part of their production activities to developing countries. Thus the material intensity in industrial countries might have declined, but the same may not be true in developing countries. The issue then is whether overall delinking is taking place. Third, some of the recent studies have found evidence of re-linking even in industrial countries. These studies argue that the energy shocks of the 1970s and the heightened environmental awareness led to policy interventions that increased resource efficiency across a wide range. However, with the utilisation

of the unexploited opportunities, the economies returned to their long-term growth trajectory in which resource use rises with income.

In spite of all these limitations, the delinking of economic growth and natural resource use has three important benefits:

- Delinking of economic growth and natural resource would mean dematerialisation of both production and consumption. Economic activities would be undertaken at the same level, but with less resources. It would release resources that could be used in alternative areas of economic growth and human development. The new technology could also make industrialisation in developing countries more affordable.
- If production were delinked from natural resource use in terms of using lesser and lesser amounts of natural resources per unit of GDP, it would also imply less environmental degradation. One corollary of delinking is that if economic growth is delinked from natural resource use, every country may be able to maintain its *environmental space* (defined as the amount of renewable and non-renewable resources that a country can afford) without depriving future generations of their rights to the same use of natural resources.
- The delinking issue has also led to the idea of a knowledge-based society, in which technology will be more human resource-dependent. Such a society could arrange both its production processes and consumption patterns with less dependence on natural resources.

Implications for achieving the MDGs

The unequal access of poor people to natural resources and the larger adverse impacts of environmental damage on poor people's lives have some direct consequences for some of the MDGs. There are also indirect implications of the deconstruction of the myths with regard to the environment-poverty linkages. Benefits associated with efficiency in resource use and the advantages of delinking economic growth and resource use have significance for the achievement of the MDGs as well.

- *Direct implications: unequal access and asymmetrical impacts*
The direct consequences of unequal access of poor people, as well as adverse impacts of environmental damages on poor people, will be felt across the MDGs.
- *Unequal access to natural resources and asymmetrical burden of environmental degradation:* Not only have poor people unequal access to natural resources, they suffer more because of environmental degradation. Soil degradation and

erosion, desertification and deforestation are affecting poor people more in terms of resources and livelihoods, leading to their further impoverishment and vulnerability. This will have an adverse effect on the goal of halving extreme poverty by 2015 and on several other MDGs.

The loss of biodiversity, and biopiracy, are robbing indigenous people of their sources of resources, livelihoods and medicine. It then becomes more difficult for them to get out of the poverty trap. In societies with a significant population of indigenous people, this will slow down the process of reaching the MDGs.

- *Inaccessibility to safe water, water contamination and wastes:* Poor people bear the major brunt of inaccessibility to safe water, water contamination, water-borne and water-related diseases. This has an adverse impact on a number of MDGs. For example, the greater inaccessibility of poor people to safe water will make the goal of halving by 2015 the proportion of poor people without access to safe water difficult. The greater inaccessibility of poor people to safe water, their larger exposure to water contamination, higher malnutrition and morbidity will have an adverse impact on school enrolment. Inadequate sanitation at school is a powerful disincentive for attending school, especially for girls.

And since child mortality is higher among poorer households, a greater incidence of water-borne and water-related diseases will make the situation worse. Increasing lead poisoning among poorer children, particularly in urban areas, may also have an adverse impact on child mortality in many parts of the world. All these will make it difficult to achieve the goal of *reducing child mortality by two-thirds* by 2015.

- *Indoor pollution:* Indoor pollution is a major problem for poorer households, which are at the bottom of the energy ladder. Every year, four fifths of the 1.8 million deaths from indoor pollution in rural areas are women, many of them pregnant or responsible for small children. As child mortality is significantly higher among poorer families, exposure to indoor pollution increases the likelihood of not achieving the goal of reducing by 2015 child mortality rate by two-thirds, as acute respiratory diseases will claim many lives.

- *Indirect implications*

The deconstruction of the myth that poor people are the principal creators of environmental damage calls for revisiting some of the policy issues, particularly policies biased against poor people. Such policies encompass pricing of natural resources, taxes and subsidies. Policy makers must reorient these policies to benefit poor people. This requires looking afresh at the ownership of common

resources, the legal framework, local management of common properties and the issue of time use by women. They must change policies and institutions to ensure access of poor people to resources. This should have a positive impact on the likelihood of meeting the MDGs.

The limitations of the *Environmental Kuznets Curve* suggest that the issue of environmental degradation cannot be left to growth alone, justifying a passive attitude to policy needs. Rather, proactive policy actions will be required for environmental protection and regeneration. The same may happen through revisiting the Beckerman Hypotheses. These will induce pursuing policies for environmental protection and regeneration, a prerequisite to achieve the goal of environmental sustainability. A re-evaluation of the Porter Hypothesis may encourage policy-makers to take a balanced approach towards environmental policies.

The MDGs will be well served by improving the efficiency of natural resource use in the production of goods and services as well their consumption, by reducing pollution and waste and by conserving natural resources. Delinking ensures more natural resource conservation, lesser environmental degradation, resources for alternative uses and emergence of a knowledge-based society. All these are contributing factors to many of the MDGs.

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