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# Sustainable Development: Towards a Broader Policy Agenda

Synthesis Chapter

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Over the last few decades economic growth in developing countries has been, with some exceptions, slow, social equity has either not improved or even worsened, and environmental degradation in many places has been significant. In many countries economic development has not been environmentally sustainable<sup>1</sup>.

A central message of this volume is that the failure to achieve environmental sustainability has been the result of a systematic under investment in public goods by governments. Being in many respects the environment a public good, the low priority assigned by governments to supplying public goods has implied a tendency to waste natural resources and the environment. Poorly functioning environmental as well as other institutions, including ill-defined property rights and inadequate environmental regulation and enforcement institutions, and a failure to implement environmental protection investments yielding high pay-offs, are consistently identified across the chapters as key sources of environmental degradation. Failure of environmental institutions is often exacerbated by complementary, cross-cutting problems: weaknesses in legal systems, under-investment in human capital, weak financial capital markets, and corruption and rent seeking, to name some of the most important.

Most developing country governments attach low priority to spending public resources on developing property rights on natural resources and their subsequent enforcement. The chapters in this volume also report consistent government failures to enforce environmental regulation and to effectively prevent encroachment and wasteful illegal exploitation of ecosystems that are nominally “protected”. Even countries that have otherwise sophisticated institutions and highly effective enforcement of property rights often fail to define and enforce property rights for the poor, and are reluctant to

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<sup>1</sup> A renewed commitment to attacking these interlocking problems of economic progress, social development, and environmental sustainability by the world community as affirmed in the 2000 United Nations Millennium Declaration and the subsequent Millennium Development Goals (MDGs) in 2002 (UNDP 2003) is in place (see Appendix). Though these are only goals, (with little mentioning of the means and policies to achieve them) they at least have the merit of incorporating not just environmental objectives and targets (Goal 7, Targets 9-11), but also a variety of other intertwined economic and social development objectives. The environmental objectives are not just important in their own right (i.e., as a source of direct value added), but also contribute to the achievement of other goals (e.g., improved health and productivity). Similarly, achievement of other MDGs (e.g., poverty reduction) may contribute to environmental protection.

spend resources in protecting ecosystems that are legally designed as protected. This may mean that the environmental failures identified in various chapters of this volume are not likely to arise simply from governments' lack of means and/or information. Given that the potential rates of return of many environmental investments and policies not implemented are apparently high, and that governments at the same time spend massive resources in other endeavors of sometimes uncertain or even dubious social value, one has to conclude that behind the above failures there is likely to be powerful political economy motivations.

Indeed the lack of environmental sustainability is only one symptom of the malaise affecting public policy priorities which also causes social inequity and persistent poverty. The same government priorities that pay little attention to basic and secondary education identified, for example by Dreze and Sen (1995), are at work in the neglect of policies and investments that could prevent environmental destruction yielding apparently a large social payoff. Moreover, as Dasgupta (1993) and other authors have shown, the losses created by environmental degradation are disproportionately paid by the poor, whose income is often most dependent on natural resources. That is, the inadequate supply of public goods which are essential for environmental sustainability "complement" the role played by under providing other public goods in worsening poverty and other social inequities.

In this introductory chapter we first briefly review recent developments in economic growth and the environment to provide a general context for the chapters that follow. We then move through a series of common themes developed from various perspectives in the chapters. These include: governance and political economy, the under-supply of non-environmental public goods, international trade issues, fiscal and structural adjustments, and the under-supply of specific natural resource and environmental goods in both quantity and quality. In the concluding section of the chapter we draw together key overarching lessons not just for better understanding environment-development linkages, but also for better managing them at both micro/sectoral and macro/economy-wide levels.

### *Modern Growth Theory and the Environment*

The literature on (endogenous) economic growth and the environment has shown that environmental sustainability can be consistent with sustained economic growth if certain conditions are met. Positive economic growth with environmental degradation may impose several costs to society: (i) The degradation of the environment directly affects the welfare or utility function of people, so that the welfare benefits of economic growth are at least in part undermined; (ii) For countries where growth itself is significantly dependent on natural resources, their degradation is likely to directly hurt economic growth at least over the medium run; (iii) For countries where growth is not resource dependent directly, continuous economic growth may be feasible at least over the short run, but the degradation of the environment may in the long-run lead the economy to approach certain critical environmental thresholds, that compromise the health and even the life of important segments of society; (iv) Environmental degradation may involve serious social equity effects as the costs of environmental degradation are not evenly shared among groups in society. The poor may suffer an inordinate share of the negative effects of environmental destruction, while the wealthy are likely to obtain most of the short-run benefits of such destruction.

Modern growth theory shows that environmental sustainability is not only potentially compatible with positive economic growth, but even more importantly, failure to achieve environmental sustainability may become an obstacle to sustain economic growth. That is, lack of environmental sustainability may not only entail non-monetary costs to society (effect (i) above), but also it may lend growth infeasible in countries where the economy is highly dependent on natural resources (effect (ii)) and, even in countries that are not resource-dependent, it may prevent further growth once the economies approaches critical environmental thresholds (effect (iii)). This means that even for policy-makers that only focus on GDP growth as a measure of economic success, environmental sustainability is a relevant goal at least over the long-run. In addition, increasing empirical evidence is showing that (iv), the negative social equity effect, is a feature of lack of environmental sustainability. Modern (sustainable) economic growth theory integrates factors (i) to (iii) within an *optimal* dynamic framework by fully accounting for the trade-offs between them and the speed of long-run

or “balanced” economic growth. Growth theory is generally mute about (iv) by mostly sticking to the representative agent approach which means that it assumes away any distributional consequences.

Growth theory has been used in the context of sustainable development in two ways: (a) as a tool to improve our measures of economic growth; (b) as a conceptual instrument to understand the feasibility and policies needed for sustainable growth. The paper in this volume by Hamilton and Hassan focuses on the measurement of economic growth. It encapsulates a number of the measurement issues and challenges that arise in addressing (i) and (ii) above. They study how growth theory can be embedded in an extension of the standard national income accounting framework under the so-called weak sustainability hypothesis. Under weak sustainability, environmental and natural resource assets – natural capital – can affect both production and utility, but there can also be tradeoffs between these assets and other forms of capital so that the theory admits the possibility of declining natural assets with sustainable income – at least for some period of time – provided there is offsetting capital accumulation in other parts of society’s wealth portfolio. The net value of all changes of capital is referred to in this literature as “genuine saving.” Negative per capita net saving must necessarily imply some eventual decline of per capita income over time.

A good empirical measure of genuine saving including environmental wealth, then, would serve as a valuable early warning indicator for an economy. A key condition for the concept of genuine savings to be valid, however, is that environmental and man-made assets be correctly valued. That is each asset price must reflect its true marginal contribution to welfare over time. That is, substitution between environmental and man-made assets cannot be linear; as environmental assets, for example, become scarcer relative to man-made assets, the shadow price of environmental assets should increase and thus any further substitution of natural capital needs a greater increase of man-made assets to compensate the welfare losses caused by environmental degradation. The second part of Hamilton and Hassan’s chapter shows what has been accomplished in this arena, which is much, but also how much further we need to go to impute reliable values to changes in natural capital. As might be expected, the more qualitative or intangible the impact, the more difficult it is to value. We may have some success imputing values to

soil loss, for example, but data and measurements problems make valuing pollution impacts in the national accounts harder and biodiversity valuation harder still.

Now we turn to issue (b), the conditions for sustainable growth. According to most growth models, the conditions for environmentally sustainable economic growth are strong even if a benign and fully informed social planner that is able to fully internalize all environmental values is assumed. These are very special conditions not only in terms of what the social planner should do to regulate and steward the growth process toward sustainability, but also in terms of assuming certain conditions about the representative agent's utility function and about the production technology that may be implausible (Aghion and Howitt, 1998).

The vast majority of the growth models are extremely aggregative not only in terms of relying in a representative agent, but also by assuming a single production sector and two or three inputs, including labor, capital, and the environment. To obtain sustainable growth some models rely on exogenous technical change which is simply assumed to allow ever decreasing pollution to output intensity (Stokey, 1998); others allow for endogenous technical change assuming that progressive tightening of environmental regulation as income grows stimulates pollution-saving technical change and, hence, decreasing pollution intensities along the growth process (Bovenberg and Smulders, 1996). Others rely on a change of the input composition that increases the human capital (a "clean" input) to physical capital (the "dirty" input) ratio (Aghion and Howitt, 1998). Less aggregative endogenous growth analyses using two sector models find that structural change from commodity production towards production of services and from physical to knowledge inputs, in conjunction with investments in environmental and natural resource protection, yield feasible sustainable economic growth (López et.al., 2004).

The assumption of a benign social planner that is able to internalize all environmental effects is obviously unrealistic. As noted by Smulders (2005), in a market economy as opposed to the idealized optimal social planner case, the ability of endogenous innovation to support sustainable growth depends critically on the institutional backdrop that allows greater or lesser degrees of internalizing market failures such as open access problems and pollution spillover effects. Also, endogenous

innovation may in some cases increase the ability to exploit a scarcer resource (e.g., declining fish stocks), rather than be a way to reduce depletion.

Even under the unrealistic assumptions concerning the full internalization of environmental effects and optimal institutions, there is another important condition for sustainable growth highlighted by all sustainable growth models. The steady state or “balanced” rate of economic growth cannot exceed certain *maximum* level. This maximum rate of growth in most analyses depends on society’s discount rate, the elasticity of the marginal utility of consumption (the rate at which the marginal utility of consumption or income falls as income increases, often called the Frisch coefficient or coefficient of risk aversion in other contexts) and the elasticity of substitution in production between man-made capital and pollution. That is, regulation and/or investments in protecting the environment required by sustainable growth leads to an equilibrium (long-run) rate of economic growth that is slower than what it would be if the environmental “problem” did not exist. Environmental sustainability requires partially sacrificing economic growth even under most optimistic assumptions, not only in the short run but also over the long-run.

In the highly stylized world of growth models, sustainable growth thus may not be feasible if the conditions regarding production technology and preferences of the representative agent are not satisfied. In this case environmental sustainability would be “technically” incompatible with positive long-run growth. If, on the other hand, these conditions are satisfied, then the planner is always wise enough to permit to maximize welfare with environmental sustainability. Despite this, it may be worthwhile to ask the following question: Assuming that the technology and preferences conditions are met, what potential “errors” of the planner could conceivable lead to a failure to achieve environmental sustainability? This is a question that is in a sense outside the realm of growth theory because it allows for the possibility that the social planner makes mistakes (or, alternatively, in the case of the market interpretation of the model, that all markets do not exist or are not perfect) but nonetheless could be of some help to guide a more empirically relevant analysis of sustainability.

Two possible mistakes of the planner may cause failure to achieve optimal (welfare maximizing) sustainable growth: (1) The planner shoots for too fast a growth

rate. That is, if he/she invests too little in the mechanisms required to prevent continuous environmental degradation. The trade-off between economic growth and environmental sustainability is not optimally balanced and you get an excessively high rate of growth over the short-run in exchange for too much (vis-à-vis what is socially optimum) environmental degradation. As a consequence of this lack of balance, over the long run the economy fails to achieve its (environmentally constrained) maximum rate of welfare growth. (2) The planner may sacrifice too much growth for the sake of avoiding environmental degradation and thus sacrifice too much economic growth over the short run.

In the real world, however, economic growth is often sacrificed not for the sake of environmental sustainability, as postulated by optimal or sustainable growth theory, but for more prosaic reasons. Economic stagnation or semi-stagnation almost always is associated with government policy failures, including misallocation of public revenues, failure to correct market imperfections, and failure to promote the development of certain basic institutions and other public goods. Behind these policy failures, in most cases one does not find only ignorance or “lack of financial means and capacity building” that economic underdevelopment may, in turn, cause. Many policy “mistakes” have political-economy roots as well.

But before discussing these political economy issues, it is important to emphasize that the diversion of the opportunities for economic growth to benefit economic elites or other special interest groups often makes environmental sustainability even harder, not easier, to achieve. If income grows slowly, the demand for environmental services expands also slowly (the marginal utility of consumption decreases more slowly over time), the social discount rate remains perhaps too high as a large segment of the population continues to live in poverty, and, most importantly, structural change (changes of the output and input composition toward cleaner outputs and inputs) is delayed.

That is, wasting the potential for economic growth negatively affects most of the mechanisms that growth theory has taught us to be important to achieve environmental sustainability. Moreover, far from causing policy makers to implement measures for environmental sustainability that could demand further growth sacrifice over the short-run, low growth rates entice policy makers to mal use the natural resources and the



environment in a usually futile effort to speed up growth. Finally, for countries where the economy is highly dependent on natural resources, this means a further reduction of the rate of economic growth over the medium run. For economies that are not resource dependent this feedback effect may not happen until the environmental consequences on the health of the population become critical. At this point, the full consequences of unsustainable growth economic growth are felt.

Thus, many slow growing countries do not fit the mold assumed by neo-classical growth models: They are not really facing a trade-off between the rate of economic growth and the degree of environmental sustainability as assumed by growth models. With the right policies and institutions they could simultaneously achieve both, faster economic growth and a better environmental performance, thus allowing for sustained and sustainable growth over the long-run. Unfortunately, however, the win-win policies that may cause such a desirable outcome are likely to hurt powerful economic interests that benefit out of the current policies.

There are, however, at least a handful of important developing countries that fit more closely the trade-offs between the speed of economic growth and environmental sustainability considered by neo-classical sustainable growth theory than most of the rest of the developing countries. India and, most especially China and Korea, have been able to maintain extremely rapid rates of economic growth for a significant time period. Recent studies have documented the astounding destruction of the environment in China over the last decade<sup>2</sup>. It is indeed difficult to expect that a country growing at 9-10% per annum is going to be able to also have environmental sustainability. The largely autocratic regime in China apparently has accepted an extreme trade-off entailing very rapid economic growth with large environmental losses (though some localized environmental improvements have been realized). Growth theory would in this case suggest that most likely this is not an optimal strategy, and that the welfare of the “representative” Chinese citizen could be enhanced by a slower growth rate that would

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<sup>2</sup> See, for example, Economy (2004) and Elvin (2004) for dramatic accounts of the massive increases of water and air pollution that are causing severe effects on the health of a large segment of the population and of the destruction of a large portion of rural ecosystems, respectively. Economy reveals that China’s environmental protection agency has a staff of 300 to deal with environmental regulation, monitoring and enforcement for the whole country of 1.2 billion people!

make it possible to have less environmental degradation or even no net degradation over the long-run.

Finally, an important question is for whom are policies optimal. Reliance on the representative agent implies that growth models simply ignore this very important question. It is here where the distributional factors come into play, across both space and time (i.e., across generations), as factors determining policies and institutions and in turn affecting the consequences of the growth process implemented under such policies and institutions. The tension between sustainability, inter-generational distribution and optimality is illustrated by a simple bio-economic model of optimal fishery exhaustion: even though the resource base in this case is renewable, impatient and egoistic individuals today may prefer inter-generally unsustainable consumption paths.<sup>3</sup> The inter-generational issue may be regarded as a problem of choosing the right discount time rate in general, and thus not inherently associated with optimal growth theory. But the issue of distribution within generations has not been tackled by growth theory; it constitutes one of its key remaining weaknesses.

#### *Governance and Political Economy.*

Most chapters in this volume conclude that excessive natural resource and environmental degradation is associated with institutional failures and market imperfections that impede the full internalization of the true social value of the environment in economic decisions. In addition, several chapters provide evidence suggesting that governments, far from dealing with such market and institutional imperfections, they mostly make them worse. “Rather than correcting market imperfections governmental intervention often aggravate them.....” (Bulte and Engel, p. 18).

A dramatic illustration of this phenomenon is provided by the so-called “perverse subsidies,” including energy subsidies, water subsidies, credit and fiscal incentives for activities such as livestock and land conversion in forest areas, and many others. This is an issue discussed at length by three chapters in this volume (Deacon and Mueller;

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<sup>3</sup> For relatively recent compendia on these subjects see Pezzey and Toman (2002) and Simpson, Toman and Ayres (2005).

López; Strand). The conclusion: despite some reforms, notably in energy, these subsidies often continue to be massive and pervasive. In addition to their micro-economic efficiency costs and the environmental consequences of induced resource over-use, they have for the most part been counterproductive even as instruments to accelerate aggregate economic growth or spread its benefits. Their main effects have been to redistribute wealth in favor of the economic elites as well as to exacerbate environmental degradation. Large subsidies, according to several analyses, constitute a heavy fiscal burden (on average they have absorbed about 25% of total government revenues in non-OECD countries), crowding out the supply of many important public goods from the fiscal budget<sup>4</sup>. Thus, subsidies may not only cause economic inefficiency and greater resource degradation, but also deepening social inequities.

It would be naïve to assume that the reason for the permanence of these subsidies is merely lack of information and lack of a clear understanding of their greatly deleterious effects by policy-makers. By now, their long-run effects are more or less known as the dissemination of studies evaluating them has been significant even through the mass media. It would, on the other hand, also be an exaggeration to blame them entirely on corruption and political contribution patterns that permit the economically powerful (the greatest beneficiaries of the subsidies) to “buy” such public subsidies. After all, these subsidies are in place in very diverse countries around the world, some of them with sophisticated and highly democratic political regimes and with seemingly low indexes of corruption.

There can also be an *ideological bias* among policy-makers and politicians which is at least in part due to factors that do not exactly correspond to the level corruption and bribery: Policy-makers are under significant pressure to attain “good” economic performance, as measured by conventional national account indicators, and mostly over a short time horizon. The fate of current policy-makers and politicians once they abandon office does not depend so much on whether or not water pollution declined or air quality improved or deforestation diminished, as on how much did GDP increased over the last

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<sup>4</sup> Alternatively, subsidies may be financed through higher taxes instead of through lowering the provision of public goods. Apart from the well-known efficiency costs of higher taxes, the social equity effects of taxation is often undesirable due to the high degree of tax evasion and the great reliance on indirect taxes in developing countries which make them socially regressive (World Bank 2004). In reality, non-social subsidies are financed through a combination of both lower investment in public goods and higher taxes.

two or three years and whether unemployment fell or how “business friendly” was his/her administration. The ability of former policy-makers and politicians to obtain juicy jobs in the private sector and even in international organizations, profitable lecture fees as well as other significant benefits, depend on this type of evaluations. This is likely to be a potent incentive for them to promote policies such as subsidies which are heavily biased in favor of economic elites and that, at least over the short run, may contribute to sustain employment levels and boosting GDP as measured by conventional national accounts. The absence of an accepted system of “genuine” national accounts is certainly a factor that conspires to preserve this ideological bias. As Hamilton and Rashid in this volume suggest it, we are still far way from the time in which genuine accounts can be widely accepted and used.

#### *Under-Supply of Non-environmental Public Goods*

The insufficient supply of non-environmental public goods in most developing countries is thoroughly documented by the literature (The World Bank, 2004; Dreze and Sen, 1995; Baland and Kotwal, 1998). Among the many *public goods* that most governments tend to under provide, the development of property right institutions is one that is emphasized by several chapters in this volume. There is an issue of lack of recognition and lack of enforcement of informal property rights of the poor, especially in rural areas, that sometimes makes them vulnerable to external challenges from big commercial interests often leading to expropriation or “enclosure” of the poor. These issues are discussed by Barbier and López in their respective contributions to this volume. In addition, unlike the enclosures in Western Europe more than two centuries ago, the property right issue in today’s developing countries is often not solved through expropriation. The beneficiaries of these usurpations rarely obtain legal rights, and often they are just happy to mine the resources especially during commodity booms. Even if they do obtain legal rights, the newly acquired rights are often not secure in part as a consequence of the illegitimate means used to obtain them<sup>5</sup>. The lack of development and subsequent enforcement of property rights is also a cause of sometimes massive

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<sup>5</sup> The challenges through occupation and other means faced by many owners of lands that were originally usurped from native communities in Latin America (Deacon and Mueller, this volume; Alston et al., 1999) is an interesting illustration of the fragility of property rights when they are acquired through illegitimate means.

illegal extraction of natural resources, including expensive woods, rare animal and plant species and many others products.

Another important non-environmental public good that appears to be heavily under supplied is human capital. The literature systematically reports extremely high and persistent rates of return over time for investments in education, R&D and other forms of human capital and knowledge enhancing investments. The under investment in human capital may significantly affect the potential for environmental sustainability. As discussed earlier, one of the most important potential vehicles for environmental sustainability is structural change. The slow investment in human capital and related knowledge assets delays structural change because clean inputs mainly consist of such assets while production of clean outputs is generally knowledge and human capital-intensive. Thus if environmental sustainability is to be achieved, it needs to rely much more on blunt, costly, and politically difficult to implement instruments, such as regulation and taxation instead of structural change. The net result: Such instruments are rarely implemented to the extent needed and the chances for environmental sustainability are considerably diminished.

The under supply of human capital also worsens poverty, as the poor are the most affected by the insufficient public support to human capital formation. The poor are affected not only by the insufficient provision of public goods but also through the *composition of the public goods* provided by governments, which is generally biased against them. For example, the emphasis on tertiary education in many countries subtract from the already limited budgets to invest in primary and secondary education, which is the component that is most beneficial to the poor. In addition, the composition of public goods tends to prioritize large physical infrastructure (roads, dams, etc) to the detriment of social public goods, including welfare and social security services. Thus, governments not only under provide public goods, but the low supply of public goods often can be biased in favor of physical infrastructure and against human and social public goods. Recent studies have shown that countries with autocratic and corrupt governments where there is little participation of the civil society in monitoring government authorities, tend

to supply not only less public goods, but also the composition of the public good is precisely more biased in favor of large infrastructure projects ( Deacon, 2002)<sup>6</sup> .

The consequence of such priorities is that poverty is more widespread and deeper than otherwise. Barbier (this volume) and several other studies have shown that poverty is a factor that worsens the degradation of certain environmental resources, such as forest, particularly in heavily populated countries. Governments frequently use development policies at the extensive margin, through colonization (often poorly conceived and poorly funded) settlement projects into remote frontier areas, as a valve of escape to relieve the political pressures of the poor in already settled areas. That is, frontier expansion in land-rich countries plays the role of substituting for social programs as an anti-poverty policy. However, as Barbier shows it, frontier expansion has rarely contributed to economic development or much less to significant poverty reduction. Frontier expansion has, however, contributed quite massively to deforestation, habitat loss for many species and other environmental losses.

#### *International Capital Mobility and Trade Issues*

Apart from the obvious effects of corruption and political contribution by the elites as mechanisms to buy subsidies from politicians, and apart from the less obvious ideological biases as a motivation for politicians to follow similar policies, there are also certain international developments that may play an important role in promoting such subsidies. Competition among countries and even among states within countries, for attracting *foreign capital* can be another important motivating factor for environmentally perverse subsidies. Though the studies reviewed by Copeland and Gulati in this volume, show that the pollution haven hypothesis is not empirically supported, given away natural resources for free to multinational corporations in addition to other subsidies and tax exemptions to try to persuade them to establish their operations in particular countries is an important instrument used by many countries (see the chapter by López in this volume, and Oman, 2004). Although empirical evidence suggests that subsidies to attract foreign investment are very large in certain countries (Calmon, 2004; Oman, 2000), there

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<sup>6</sup> It may also be, as Sterner and Somanathan's paper and others in the volume indicate, that in the environmental and resource sphere at least the problem is also one of supplying the wrong kinds of infrastructure.

are no studies showing that these subsidies have indeed played an important role in affecting the location of foreign investment. But there is increasing empirical evidence showing that the fiscal costs of these apparently futile efforts to attract foreign investment (“race to the bottom”) are significant.

Has *trade openness* worsened the tendency to waste scarce fiscal resources and natural resources through subsidies? According to the chapter by Copeland and Gulati in this volume, trade openness has not played an important role among countries that do not have comparative advantages in natural resource-intensive activities. For such countries, a weak domestic environmental policy, while contributing to increase pollution in general, has not been a decisive factor in attracting “dirty” industries. The authors point out, however, that emerging empirical evidence suggests that countries that are natural-resource-intensive exporters with weak domestic institutions are vulnerable to increased natural capital degradation from trade liberalization. In these countries, trade liberalization may also lead to increased pressures on policy-makers to also “liberalize” access to natural resources by corporations and to increase the “incentives” (e.g., subsidies) to such corporations to become more competitive in world commodity markets.

The size of perverse subsidies appears to be even larger among natural resource-abundant countries, the countries affected by the so-called resource “curse”. As the chapter by Deacon and Mueller points out, there is evidence suggesting that natural resource abundance is associated with to poor governance and to poor institutions. In turn, earlier works by Deacon (2002) as well as by others have shown that poor governance, lack of democracy and lack of participation of the civil society increase the tendencies of governments to waste public revenues in non-social subsidies (including perverse ones) mostly directed to the economic elites and to under provide public goods.

Copeland and Gulati do not explicitly deal with *trade in services*. A relatively recent development has been the promotion of free trade in services especially between North and South. A fundamental consequence of the liberalization of service sectors is freeing the service sectors of limitations on foreign ownership, often after privatization of service sectors previously in public hands. Once foreign ownership is established the foreign investment agreements are often ruled by GATT rules as established by WTO or

through more ad-hoc Regional or Bilateral Free Trade Agreements (Mann, 2004). The overwhelming aim of these rules is to protect foreign investment against policy changes not foreseen at the time the investment takes place. Moreover, complaints from foreign investors are mainly subject to international arbitral decisions not subject to appeal in any national court of law. Mann (2004) points out that “.....it is questionable whether such arbitration tribunals would apply human rights and environmental laws when considering the scope of a state’ rights and obligations” (p. 14).

The consequences of all this for the host countries that decide to change some of their policies are becoming increasingly more serious. Argentina is facing lawsuits for \$16 billion (6% of its annual GDP) from several foreign firms in reaction to state policy changes, mainly the exchange rate devaluation that took place in 2002, that may have affected their profits (Solanes, 2004). Other countries, including Mexico, Chile, Nicaragua, and many others are facing similar legal challenges albeit not to the same extent as Argentina’s ( Mann, 2004; Solanes, 2004). Some countries have had to turn back important environmental regulation under threats by foreign firms to bring their cases to international arbitration. Apart from the obvious losses to governments which may be forced to divert resources that otherwise could be spent on social or environmental ends to pay compensation to foreign investors, the tight grip of foreign capital may significantly restrict the scope of countries to implement reforms that reduce subsidies and change policies. This could be a factor that may militate against sustainable development<sup>7</sup>.

The failure of the international community to develop mechanisms to compensate developing countries for *global services* such as retention of carbon and other climate changing gases, as well as services related to biodiversity preservation is another important international factor that contributes to worsen the chances of environmental sustainability. The rich countries, presumably because of their high income, are more able to value and to afford paying for such services than developing countries (Albers and Ferraro, this volume). Yet, the international institutions that could make the development

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<sup>7</sup> The case of NAFTA and the current US Model Bilateral Investment Treaty are particularly worrisome. NAFTA and other US bilateral free trade pacts use a top down approach where foreign investment in all sectors is considered covered by the investment protection agreement unless specific exclusions are negotiated. This may be particularly risky to poorer countries with low capacity to negotiate exclusions that are thus being exposed to great losses in the event that their policies need to be changed.



of trade in environmental services possible are at best at an incipient state of development. As Albers and Ferraro point out, the failure to develop adequate international trade (in environmental services) mechanisms is related not only to failures at the international negotiation level but also to the property right imperfections and government failures in developing countries as well. Successful trade in environmental services needs the assurance of compliance with international contracts, which can only be guaranteed if domestic institutions that assign responsibility for contract enforcement are in place.

### *Fiscal and Structural Adjustments*

Apart from openness to trade and capital inflows, another important international influence affecting developing countries is the policy role played by international organizations such as the World Bank and the IMF. Fiscal adjustment (monetary and fiscal policies to induce macroeconomic stability and to correct for internal and external disequilibria) has been a main mechanism used by the IMF to influence short-run policies, while structural adjustment (trade, factor market, and financial liberalization, privatization, and others) has been a key vehicle to influence long-run policies by the World Bank and associate international institutions. The chapter by López in this volume argues that despite, or perhaps because, the policy agenda promoted by international organizations is hardly concerned about environmental sustainability, such an agenda has significantly affected the environmental consequences of economic growth. The demands from the IMF for cutting fiscal deficits have generally been met through reducing even further the supply of public goods by governments, among others the supply of environmental public goods, thus worsening the environmental distortions. In addition, structural adjustment gave only scant technical and financial support to the development of environmental institutions and regulation<sup>8</sup>.

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<sup>8</sup> For his part, Strand notes that the direct impacts of a domestic economic crisis will depend on its nature, e.g., a drop in a commodity export price could lead to less extraction unless the state itself raises extraction rates to compensate for lost revenue. However, the indirect effects resulting from a general drop in incomes could be as serious as any direct effects, e.g., more intensive land exploitation with a return to subsistence agriculture, or state efforts to enhance competitiveness through relaxed controls on resource use and environmental degradation.

At the same time international institutions, mainly through structural adjustment, demanded that developing countries integrate themselves to world commodity and financial markets very rapidly. As economic openness increases, there is an increasing need to develop measures to prevent that the significant market and institutional imperfections affecting the environment undermine, or even turn negative, the gains from globalization (Copeland and Gulati, this volume). Thus, precisely at the time when environmental institutions and regulation were most needed, the combined effect of structural and fiscal adjustments was to further discourage such endeavors.

But perhaps the greatest negative side-effects to sustainable development have resulted from the narrowness of the policy agenda of international financial institutions. There has been a strong preoccupation with preventing governments from interfering with markets. The removal of government-induced market distortions in some cases was a single-minded objective. This narrow approach neglects to address distortions due to market imperfections and to *government-induced distortions* through mechanisms other than market intervention.

Among the ignored non-market distortions is the public sector expenditure allocation, as already noted, including subsidies to the rich and the under supply of public goods phenomenon. As long as the subsidies were provided through mechanisms that were not openly distorting markets, they were often not a matter of concern to fiscal and structural adjustments. Massive financial grants, land gifts, and natural resource transfers for free, and special tax exemptions, usually enjoyed by rich individuals and corporations, as well as financial bail outs of unregulated banks and other financial institutions, were rarely even mentioned as a concern in the structural adjustment reports<sup>9</sup>. It is now clear that fiscal tightening while at the same time protecting expenditures on non-social subsidies is bound to cause an even graver under supply of public goods, including environmental protection, human capital and social anti poverty programs. All this drastically affects the potential for sustainable development.

#### *Under-Supply of Natural Resource and Environmental Goods*

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<sup>9</sup> The case of the recent bail out of one bank and its few but highly influential customers by the government of Dominican Republic is an important recent illustration. The almost \$2 billion spent by the government in this endeavor (more than 25% of the country's GDP) practically ruined the country and triggered a massive economic recession in 2003. International financial institutions, often ready to advise against market interference by governments, were conspicuously complacent about this particular interference.

Consistent with the hypothesis of under investment in natural capital advanced above, a number of the chapters identify several investments in improving natural and environmental resources that appear to exhibit high social rates of return that, nevertheless, are not implemented. Investments in water supply, watershed protection, soil conservation and in other environmental resources of national or domestic value have large rates of return, yet governments often attach relatively low priorities to their implementation. As one would expect given the theory of international public goods and international agreements for their protection (e.g., Barrett 2003), the situation of resources of global value such as biodiversity conservation and carbon retention services, is worse. In addition to domestic institutional failures, inadequacies of international institutions largely prevent compensating developing countries for the provision of such services, and consequently, this international institutional failure becomes an important additional source of environmental distortion.

The chapters by Dinar and Saleth and Barnes and Toman take up the problem of chronic under-supply in many developing countries of two key natural resource goods: water and energy. Both of these goods figure prominently in the Millenium Development Goals, and this is not a coincidence given their important influence on economic growth and social development. The *quality* of water resources also is of obvious importance and is addressed in the chapter by Markandya that we discuss below. Both the Dinar-Saleth and Barnes-Toman chapters take up themes that already have been identified in previous chapters. Problems of resource availability often reflect as much difficulties in the provision of adequate and appropriate delivery infrastructure as basic problems of material scarcity, though countries with limited water or the need to import large quantities of expensive energy face additional challenges.

Infrastructure problems in turn reflect a variety of market and institutional distortions. Government agencies providing these services usually do not have strong incentives for efficiency and reliability of service, and may in particular have a bias for larger but less cost-effective investments. Private provision of infrastructure may in turn be impeded by government regulations that limit entry or distort investment choices. Looking over both public and private provision are problems related to the political economy of these services, especially the desire to hold down prices in an effort to

benefit the poor. Revenue shortfalls can undermine the financial and therefore the economic sustainability of the services, as well as draining badly needed funds from the public budget for poorly-targeted subsidies.

In their analysis of energy and in particular electricity service provision, Barnes and Toman argue that increased availability of modern energy services is an important driver of social and economic development, and that increased attention to the social value of increased energy availability as well as the cost of service provision is needed in overall energy policy and planning. There is a need also for flexibility in the ways these services are provided. In many cases smaller-scale systems, especially renewable based systems, are the best practical option even though theoretically they are less technically efficient than larger-scale grid-based electricity which may take years to arrive. These systems can be combined with targeted subsidies of fixed capital and connection costs to benefit the poor without creating the costly and distorting effects of usage subsidies.

Dinar and Saleth address some broadly similar issues in their analysis of water resources provision, though the conclusions they reach are somewhat different in light of the long and difficult history of water allocation in all societies. They note that while the standard economic prescription of more efficient water tariffs and greater involvement of the private sector is conceptually sound and has been effective in improving water allocation, in practice this seemingly sound advice has been taken relatively infrequently. Their diagnosis of the problem echoes themes of political economy, property rights, and endogenous institutional constraints identified in previous chapters. Specifically, they argue that institutional transactions costs and idiosyncratic linkages of water reforms to other issues (e.g., public debt, crises in agriculture or electricity sectors) influence the practical capacity to implement standard economic prescriptions for efficient pricing, and that reforms must be designed incorporating these endogenous constraints and the political interests of powerful interest groups.

The next two chapters, by Bulte and Engel and Albers and Ferraro, take us to consideration of natural and environmental resources – forest landscapes and terrestrial protected areas more generally – that provide multiple potential benefits and involve substantial quality as well as quantity components. Bulte and Engel summarize the many causes of deforestation, from the direct effects of weak property rights regimes and rent

seeking to induce effects of increased returns to agriculture in land clearing or incentives to mine forests for cash flow in the face of debt problems. What is the social cost of excessive tropical deforestation? The losses range from reduced yields of timber and non-timber forest products to reduced flows of a variety of ecosystem services, from erosion control to carbon sequestration. It is perhaps somewhat surprising, however, that the *marginal* value of these losses is in some cases relatively low – not large enough *per se* to trump economic gains from forest clearing.

This chapter and the chapter by Albers and Ferraro on protected areas management also emphasize two other critical points. The first is the large degree of uncertainty surrounding efforts to economically value the ecosystem services in question, and the need to incorporate in some way the value of protecting these ecosystems as a way of reducing the risk of adverse economic and social impacts even if the expected values of conservation or protection benefits seem a bit low. A corollary observation is the essential need for more primary research on the valuation of local/national benefits of ecosystem services in developing countries as well as the global benefits of services like biodiversity and carbon sequestration. Albers and Ferraro in particular sketch some promising directions for such work drawing on recent developments in spatial economic analysis as well as inter-disciplinary assessments of ecosystem functions.

The other critical point is the need to undertake practical measures for conservation and protection that reflect the incentives and institutional conditions present. Both chapters describe sometimes quixotically hopeful efforts to engineer increased protection as an indirect co-product of ostensibly sustainable local land and resource development programs. Often, such efforts deliver neither the desired protection outcomes, because the incentives to do so are indirect and weak, nor the local benefits of sustainable resource development. Two other alternatives explored in the chapters involve direct financial transfers for protection (e.g., compensation for foregoing access to sensitive areas), or direct local participation in reaping financial rewards of conservation (e.g., local participation and benefit sharing in game protection for ecotourism). In principle these approaches should have stronger, more direct incentive effects. In practice, institutional weaknesses in monitoring and enforcing conservation requirements and outcomes can undermine these activities via “paper parks” or other

forms of encroachment and opportunistic rent seeking. Once again a key issue to be addressed in designing effective policies is the recognition not just that institutions matter, but that their performance is endogenous to the economic rewards and costs present.

The same problem arises in connection with activities to limit net greenhouse gas emissions through both fossil fuel combustion and changes in land cover. Neither the Convention on Biodiversity nor the Framework Convention on Climate Change yet offer solid mechanisms for monetizing and rewarding the global value of efforts in developing countries to produce these global public goods. There is the beginnings of this under the Kyoto Protocol to the Framework Climate Convention through the adoption by industrialized (“Annex B”) countries of limits on greenhouse gas emissions, and the ability of developing countries to earn revenues through the production of “carbon emission reduction credits” (CERs). But this mechanism remains weakened by uncertainties about developed country commitments to their Kyoto targets, and by uncertainties about negotiations of future targets. This lowers the economic reward to sustainable energy and land management over and beyond the softness of nominal emission targets under Kyoto, and beyond any domestic obstacles to more environmentally sustainable management.<sup>10</sup>

That there are weaknesses in international commitments to produce global public goods is not surprising given what is understood theoretically about the tendency for these agreements to be weak and fraught with free riding. Nor is it surprising from a political economy perspective that the developed world would decry unsustainable resource management in the developing world while also participating or acquiescing in weak international commitments themselves. The facts remain that (a) there are win-win opportunities for jointly deriving local/national and international benefits from more sustainable management; and (b) given the greater ability to pay of rich countries and the need for developing countries to focus on raising their own living standards without undermining their own natural capital, greater success in the production of international environmental public goods still depends on the leadership – not just piety – of richer countries in bearing the burdens.

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<sup>10</sup> Despite criticism by many environmentalists on this point, it is not necessarily bad in itself.

The last 3 chapters emphasize the valuation and management of environmental good with a strong quality dimension, in particular clean air and water. The chapter by Sterner and Somanathan embeds this discussion in a larger context by noting first that while some of the needs of the poor in developing countries are similar to those for residents of richer countries, such as clean air and water to protect human health, other needs of the poor are more distinctive, such as access to and protection of basic land fertility in contrast to environmental recreational opportunities. They suggest and illustrate with examples that a variety of institutional and political economy problems already identified above – including concentration of political power that masks broader social preferences and causes misallocation of social investment as well as more conventional concerns with corruption – need to be addressed in constructing effective environmental policies in developing countries. As well, they argue that in designing environmental protection instruments the tools used must reflect the institutional capacities for design, monitoring and enforcement. The role of market based instruments may be more circumscribed, for example, even though these instruments can be very cost-effective, if broader market distortions or lack of effective monitoring impede the operation of the economic incentives.<sup>11</sup>

The chapter by Markandya takes up one of the central challenges of the Millenium Development Goals: the provision of clean water for human use, and more generally the treatment of waterborne effluents to protect both water sources for human use and inland aquatic ecosystems. Markandya summarizes both the compelling health evidence in support of safe water provision and the economic valuation of these benefits and the benefits of ecological protection, which is at the cutting edge of environmental valuation research and practice.

The conclusions of the chapter may be somewhat surprising. The MDGs call for halving (by 2015) the number of people without access to safe drinking water, and for reducing significantly those without access to modern sanitation. Assuming a 50% cut in those without access to sanitation as well, Markandya concludes that available evidence

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<sup>11</sup> In comparing incentive based instruments to alternatives such as traditional technology or performance standards, it is important to avoid comparing the actual to the ideal. It is well known that the incentive based instruments are not a substitute for effective environmental laws, effectively implemented. On the other hand, lack of monitoring or enforcement capacity also will undercut the effectiveness of the more traditional instruments as well.

on benefits and costs supports these twin objectives. However, the achievement of the sanitation goal is several-fold more expensive than the achievement of safe water access per se, which may be accomplished in several ways without necessarily resorting to greatly expanded sanitation investments.<sup>12</sup> When one looks separately at the two objectives (water and sanitation), the economic case for the former is much stronger than for the latter. Subject to the caveat that in some cases sanitation may indeed be the best or even the only way to ensure safe local water supply (along with investments to increase the safety of the water delivery system), this finding is of considerable relevance for decision makers in developing countries who must set priorities in the use of very scarce investment resources.

Markandya also underscores that the limited evidence available suggests that poor as well as rich households have a willingness to pay for safe water that is well above current water prices and sufficient to provide a financial base for enhancing household water quality, especially if poorer households receive well targeted subsidies for connection in lieu of more poorly targeted consumption subsidies from richer to poorer users. This indicates one more time that the challenge to the provision of this critical environmental quality attribute is political and institutional (e.g., are people willing to pay without more assurance that existing municipal authorities will actually deliver the good?), rather than a matter of costs versus benefits *per se*.

The economic evidence on the value of cleaning up water bodies for other uses is even more limited and equivocal. Looking at a number of case studies, Markandya concludes that while river basin clean-up may be a priority in many environmental agendas, the overall economic benefits (including all amenity and other values) may not be sufficient to justify the costs unless the water body has special cultural significance, or it is very costly to turn to other sources. Water bodies with significant biodiversity potential also generate global public benefits, but as already noted the capturing of these benefits in payment streams to those who would incur the costs of clean-up so far is somewhat elusive.

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<sup>12</sup> Safe water could be provided by tapping more remote clean sources that are protected through an upstream integrated river basin management plan, and investing in ensuring that the delivery system is not subject to contamination, without necessarily investing in greatly expanded downstream municipal household effluent treatment.



Many similar issues arise in the assessment by Krupnick of health impacts from urban (outdoor) air pollution and of various options for ameliorating these impacts.<sup>13</sup> Drawing on similar or analogous bases of information in linking pollution to health and in valuing the health impacts, Krupnick notes that from an economic perspective it is important to set priorities and target policies. Fine particulates from various sources have been implicated as a much more serious health threat than some other pollutants, in terms of chronic lung disease and other illness as well as premature death. Airborne lead from gasoline also has been implicated as a serious health problem, and while this threat has been abated in many countries it still lingers, notably in Africa. These problems, while smaller in the aggregate than the health problems associated with water contamination, are significant enough in the overall hierarchy of threats to human health in developing countries to warrant serious policy attention.

After establishing these points, Krupnick reviews some recent experience with policies to ameliorate urban airborne pollutants. The examples he gives echo the point made by Sterner and Somanathan about the need to craft policy to circumstances. Krupnick does however provide a variety of examples, especially in Asia, of the potential for the use of incentive-based instruments for pollution control. In some cases these instruments may be less direct and therefore less efficient than a direct attack on a pollutant – for example, a fuel tax in lieu of a direct measure for controlling diesel-based particulates. Nevertheless, even indirect incentive-based policies may offer opportunities to improve on the performance of more command-and-control based measures.

### *Concluding Comments*

In these final comments we would like to try to highlight four cross-cutting messages that we believe are especially important for decision makers seeking to strengthen environmental policies individually and the environmental sustainability of economic growth generally. The first point is the need to broaden the discussion of environmental sustainability. Contrary to what many believe, environmental sustainability is not achieved merely through environmental policy, not even through

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<sup>13</sup> Indoor air pollution, mainly from smoky fuels in poor households, also is a serious health concern. This problem is addressed in the energy chapter by Barnes and Toman.

optimal environmental policy. Optimal environmental policy in the context of economy-wide policies that consistently discriminate against the poor and under provide non-environmental public goods such as human capital, for example, would amount to pressing the brake and the accelerator at the same time. It would not assure neither sustained nor environmental sustainable economic growth. We need not only to see the environment as an important value, for which the evidence is compelling, but we also need to address the interactions between under-provision of the environment and non-environmental economy-wide policies. This calls for a more holistic and integrated approach to policy in which some of the most important actions in support of environmental values may focus on, e.g., financial markets or human capital, even while the contributions of good environmental policy to sustainable development also are addressed.

The second point is the pervasiveness of the political economy challenges resulting from weak or opaque property rights in many spheres. By this we mean not just the problems directly plaguing governance of environmental resources, but also the problems citizens face in exerting a collective demand for less corruption, more efficient and fair taxation, and the like. Having noted the problem, we are left somewhat humbled by the chapters in this volume regarding proposed solutions. Sometimes, the authors have pointed out, innovative solutions involving different strategies of decentralization and public participation can be effective. But other times this is not the case, and solutions need to be based on solid evidence of promise versus romantic wishes.

Our third point is that while expanded trade may sometimes exacerbate the lack of environmental sustainability, there is no (at least not yet) broad and deep evidence of international trade itself has become an obstacle for environmental sustainability. Though trade liberalization is often analyzed separately from the liberalization of capital flows, it is clear that liberalizing trade of services is closely linked to foreign investment expansion. While foreign investment have at times contributed to economic growth, increasing evidence is pointing to the emergence of biased legal international institutions that limit independent policy-making and environmental regulation by the states. The effects of domestic fiscal and structural adjustment programs, on the other hand, seem more worrisome, though here again the empirical record so far is not entirely clear. It is

clear, however, that fiscal and structural adjustment programs have missed in the past an opportunity to help addressing many of the key issues that have contributed to slow long-run growth, inadequate social equity and environmental degradation in a large number of developing countries.

The fourth and last point we wish to underscore is a corollary of the first three: there is a crying need for more and better empirical work of environment and development issues and policies in developing countries. There is also a need for international economic institutions to broaden their policy advice and become players acting in favor of a more balanced political economy so that governments get induced to give a greater weight to the needs of the poor and to environmental sustainability in their policy agenda. At the global level there is also a need for greater balance in the role of international institutions so that the emerging global arrangements take the interests of the developing countries more seriously.

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## Appendix

### Millennium Development Goals and Targets/Indicators

#### **Goal 1: Eradicate extreme poverty and hunger**

**Target 1:** Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

**Indicators:**

1. Proportion of population below \$1 per day (PPP-values)
2. Poverty gap ratio [incidence x depth of poverty]
3. Share of poorest quintile in national consumption

**Target 2:** Halve, between 1990 and 2015, the proportion of people who suffer from hunger

**Indicators:**

4. Prevalence of underweight children (under five years of age)
5. Proportion of population below minimum level of dietary energy consumption

#### **Goal 2: Achieve universal primary education**

**Target 3:** Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling

**Indicators:**

6. Net enrollment ratio in primary education
7. Proportion of pupils starting grade 1 who reach grade 5
8. Literacy rate of 15-24 year olds

#### **Goal 3: Promote gender equality and empower women**

**Target 4:** Eliminate gender disparity in primary and secondary education preferably by 2005 and to all levels of education no later than 2015

**Indicators:**

9. Ratio of girls to boys in primary, secondary and tertiary education
10. Ratio of literate females to males of 15-24 year olds
11. Share of women in wage employment in the non-agricultural sector
12. Proportion of seats held by women in national parliament

#### **Goal 4: Reduce child mortality**

**Target 5:** Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate

**Indicators:**

13. Under-five mortality rate
14. Infant mortality rate
15. Proportion of 1 year old children immunized against measles

#### **Goal 5: Improve maternal health**

**Target 6:** Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio

**Indicators:**

16. Maternal mortality ratio
17. Proportion of births attended by skilled health personnel

#### **Goal 6: Combat HIV/AIDS, malaria and other diseases**

**Target 7:** Have halted by 2015, and begun to reverse, the spread of HIV/AIDS

**Indicators:**

18. HIV prevalence among 15-24 year old pregnant women
19. Contraceptive prevalence rate
20. Number of children orphaned by HIV/AIDS

**Target 8:** Have halted by 2015, and begun to reverse, the incidence of malaria and other major diseases

**Indicators:**

21. Prevalence and death rates associated with malaria
22. Proportion of population in malaria risk areas using effective malaria prevention and treatment measures
23. Prevalence and death rates associated with tuberculosis
24. Proportion of TB cases detected and cured under DOTS (Directly Observed Treatment Short Course)

#### **Goal 7: Ensure environmental sustainability**

**Target 9:** Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources

**Indicators:**

25. Proportion of land area covered by forest

26. Land area protected to maintain biological diversity

27. GDP per unit of energy use (as proxy for energy efficiency)

28. Carbon dioxide emissions (per capita) [Plus two figures of global atmospheric pollution: ozone depletion and the accumulation of global warming gases]

**Target 10:** Halve, by 2015, the proportion of people without sustainable access to safe drinking water

**Indicators:**

29. Proportion of population with sustainable access to an improved water source

**Target 11:** By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers

**Indicators:**

30. Proportion of people with access to improved sanitation

31. Proportion of people with access to secure tenure

[Urban/rural disaggregation of several of the above indicators may be relevant for monitoring improvement in the lives of slum dwellers]

Goal 8: Develop a Global Partnership for Development

Target 12: Develop further an open, rule-based, predictable, nondiscriminatory trading and financial system. Includes a commitment to good governance, development, and poverty reduction – both nationally and internationally

Target 13: Address the Special Needs of the Least Developed Countries. Includes: tariff and quota free access for LDC exports; enhanced program of debt relief for HIPC and cancellation of official bilateral debt; and more generous ODA for countries committed to poverty reduction

Target 14: Address the Special Needs of landlocked countries and small island developing states (through Barbados Program and 22nd General Assembly provisions)

Target 15: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term

**Indicators:**

32. Net ODA as percentage of DAC donors' GNI [targets of 0.7% in total and 0.15% for LDCs]

33. Proportion of ODA to basic social services (basic education, primary health care, nutrition, safe water and sanitation)

34. Proportion of ODA that is untied

35. Proportion of ODA for environment in small island developing states

36. Proportion of ODA for transport sector in land-locked countries

37. Proportion of exports (by value and excluding arms) admitted free of duties and quotas

38. Average tariffs and quotas on agricultural products and textiles and clothing

39. Domestic and export agricultural subsidies in OECD countries

40. Proportion of ODA provided to help build trade capacity

41. Proportion of official bilateral HIPC debt cancelled

42. Debt service as a percentage of exports of goods and services

43. Proportion of ODA provided as debt relief

44. Number of countries reaching HIPC decision and completion points

Target 16: In co-operation with developing countries, develop and implement strategies for decent and productive work for youth

**Indicators:**

45. Unemployment rate of 15-24 year olds

Target 17: In co-operation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries

**Indicators:**

46. Proportion of population with access to affordable essential drugs on a sustainable basis

