

**"PRAGMATISM AND EFFECTIVE POLICY-MAKING
FOR ENVIRONMENT AND DEVELOPMENT"**

by

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PRAGMATISM AND EFFECTIVE POLICY-MAKING FOR ENVIRONMENT AND DEVELOPMENT

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Abstract

This paper presents a partial review of written and verbal contributions to a workshop entitled "Pragmatism and Effective Policy-Making for Environment and Development". The workshop - designed to be an interdisciplinary contribution to policy discussions surrounding issues of sustainable development - was held in Abisko, Sweden. Co-sponsors of the workshop were the International Institute for Applied Systems Analysis (IIASA) Austria, and the Swedish Council for the Planning and Coordination of Research (FRN), Sweden. Three case studies - food security, energy for development, and international indebtedness - were used as entry points for identifying over-arching themes and commonalities in the causes and possible solutions of problems in the environment-development nexus. The workshop aim was to characterize the dynamics of development processes and to look at biases, distortions, and other correctable factors that currently contribute toward adverse trends. The focus of the current paper is on the case-studies and the general environment-development policy issues that these illustrate. These general issues are taken up in greater detail in a book, currently in preparation, which provides a complete report of the workshop.

Introduction

The theme of the Abisko workshop was "pragmatism". Its purpose was to look at the environment-development nexus impassionately but constructively. It was to see environment and development problems as one set of problems facing mankind; not necessarily the most critical, but one where timely action might avert future crises and avoid high adjustment costs.

What we mean by "pragmatism"

What do we mean by "pragmatism" in the context of policy making for environment and development? The tension between what would be the "ideal" and what is practical is an illustration in point. It was cited early in the workshop discussions, for example, that, however seemingly moral, the so-called Polluter Pays Principle (PPP) has become an obstacle to implementing environmental programs. Also, by abstracting a pollution problem from its overall context and preempting the form of any solution, the PPP is stifling creative thought on alternative approaches. Sweden's situation vis-a-vis transboundary acidifying pollutants coming from its former Eastern-bloc neighbors is a suitable example. However morally correct the PPP might seem, the simple truth is that the source countries have insufficient capital to make the protection of Swedish lakes and soils an investment priority.

¹ Paul Weaver and Uno Svedin were jointly responsible for the design and organization of the Abisko workshop. At the time of the workshop, Paul Weaver was Coordinator of the Environment and Development Project at the International Institute for Applied Systems Analysis (IIASA). He is currently Research Project Manager at the Center for the Management of Environmental Resources, INSEAD and Guest Research Scholar at IIASA. Uno Svedin is with the Swedish Council for the Coordination of Research (FRN).

To concentrate on positive ways forward was one aspect of being pragmatic. Another was to be explicit about (rather than ignore) factors like corruption, vested-interest, institutional biases, and uncertainty and to include these in the analysis. Our starting point was that, to be effective, policy must be formulated from an understanding of environmental, economic, and societal systems and their intersectoral dynamics. Rather than presuppose that solutions should be purely technological or social or economic, the interplay between these should be factored into our analyses. Can solutions be found that actually *harness* rather than go against the forces and weaknesses of human nature? Does a more holistic approach to environmental and developmental issues suggest options that sectoral analyses would overlook? Can two or more separate problems be linked together in ways that suggest new solutions?

Being pragmatic also means being realistic about what can be achieved by policy-makers with limited resources and powers. In this, the linkages between different objectives and the degree to which any measures taken either help or hinder progress on other goals is very important. A further aspect is the priority to be ascribed different measures; often, it is not so much a matter of deciding what to do, as of deciding when and in what order measures should be taken. Could the workshop suggest trigger points in critical sectors or help establish priorities across possible measures? Could it identify unfavorable trends dominated by positive feedbacks and suggest ways of restoring stability and control? The willingness to treat environmental and developmental concerns jointly - as witnessed in the recent United Nations Conference, the Earth Summit² - creates new opportunities. Could the workshop demonstrate some of these? More particularly, could it provide sufficient illustration to stimulate a more wide-ranging and systematic search for new approaches and solutions?

A further element of the attempt to be pragmatic was to recognize and respect the different positions held by different analysts on questions of sustainability, all the more important since division - both scientific and political - is becoming a barrier to timely action. Division over the cause and severity³ of environment-development problems is matched by division over

² For some, the ambitions of the much publicized and highly politicized United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro, June 1992, have not been realized. Certainly, if one were to judge from the very limited tangible outcomes - the financial pledges and the rather restricted conventions on biodiversity and climatic change - its achievements were indeed modest. If anything, these merely confirm that the time is not yet ripe for meaningful general global agreements. Judged rather differently, as the start of a process of coordinating efforts toward finding new approaches toward development, UNCED marks a seminal change in thinking. It forced everyone involved in long-term policy - politicians, scientists, business leaders, governmental and non-governmental organizations - to take stock. It also brought acceptance of the conjunction of environment and development, that the two are interrelated and inseparable.

³ For some, stagnation is the key problem. For others, further economic development is the greater threat. There are the optimists who work from the premise that what we are doing now in technology and the economy can continue to the increased benefit of more and more people, and the pessimists who extrapolate current trends and see an irreconcilable mismatch between future human needs and the resources available to meet these. Some see rapid population growth as the root cause. For others, this is simply one more manifestation of poverty, of the failure to develop. They point to extremes of wealth and poverty and the economic polarization of societies as causal factors. Others would argue that wealth, per se, is not the problem and would rather point to the combination of wealth with consumerist lifestyles and a cultural trend toward instant gratification. These differences of opinion are considered more closely in Keyfitz N., (ed), Science and Sustainability, 1992, a report on an international, interdisciplinary conference held to mark the 20th. anniversary of the International Institute for Applied Systems Analysis.

what needs to be done. For some, further freeing of markets is a necessary precursor for sustainable development. Only when market signals accurately reflect our "true" valuation of resources will the right balance be struck between development and our wish to protect the environment. For others, for all its merits in allocating resources efficiently, a perfectly operating market could never, of itself, provide for the interests of generations not yet born. There are those who argue for greater governance and write of planetary management.⁴ For others, the very notion of planetary management is ethnocentricity in the absurd.⁵

What does pragmatism mean in this context? In different shades, each viewpoint was represented among workshop participants.⁶ But the pragmatic approach was not to engage in counterproductive debate on which viewpoint is closest to the truth. Instead it was for each participant to accept, for sake of argument, the premises upon which others' arguments are based and the conclusions that follow from these. Accepting those conclusions, what then would be an appropriate course of action? The complement was, so far as possible, to redefine issues in non-divisive terms. Is the problem of environment, for example, isomorphic with the need to control human population or to restructure the prevailing international order? In either form, such characterization is inherently divisive. Analysis would serve only to further pry the fractures between developed and developing countries. Can the issue be reframed to be amenable to some cooperative solution? The notion that it is not humans per se that matter, but how they use resources provides scope for a more creative dialogue.

Approach

What kind of questions was the workshop intended to answer? What kinds of output was it hoped to achieve? In answering these questions it is as important to say what the workshop was not as well as what it was intended to achieve. It was certainly not the intention to

⁴ The Atlas of Planet Management, Myers, N. (ed.) and the special edition of Scientific American entitled "Managing Planet Earth", September 1989, are representative of this approach. The latter is cited as such by Daly, H., in Ecological Economics: The Science and Management of Sustainability, Costanza, R., (ed.), 1991.

⁵ Orr (cited by Daly), writes that we need to manage ourselves more than the planet and our self-management should be "more akin to child-proofing a day-care center than to piloting spaceship earth." Extending the analogy, Daly writes: "The way to child-proof a room is to build the optimal scale playpen within which the child is both free and protected from the excesses of its own freedom. It can enjoy the light and warmth provided by electrical circuits beyond its ken, without running the risk of shorting out those circuits, or itself, by experimenting with the *planetary management technique* of teething on a lamp cord." Daly, H., in Ecological Economics: The Science and Management of Sustainability, Costanza, R., (ed.), 1991.

⁶ The workshop brought together 18 participants from developed and developing countries and received input from a further 10 correspondents. The expertise of those involved spanned the domains of science, business, technology, economics, politics, law, international finance, and negotiations. Participants included: Eric Arrhenius, Robert Ayres, Edith Brown-Weiss, Alan Durning, Karerina Eckerberg, Gerhard Heilig, Thomas Johansson, Karl-Eric Knutsson, Girma Kebede, Nathan Keyfitz, Hans Landberg, Sture Oberg, Roger Rainbow, Fransisco Sagasti, Arie Shachar, Roderick Shaw, Uno Svedin, and Paul Weaver. In addition, the workshop received input from 10 correspondents: Herman Daly, Gilberto Gallopin, Robert McNamara, Norman Myers, Pierre Pradervand, Ignacy Sachs, Lee Schipper, John Shilling, Bertram Spector, and Richard Tropp.

define sustainable development,⁷ although it was felt necessary and important to agree upon general principles that could be used as criteria for judging particular measures as taking us further from or closer to the rather ill-defined condition "*sustainability*". Other than for purposes of illustration, the aim was certainly not to produce specific policy recommendations in respect to any particular problem. Rather it was more generally to consider ways of creating a context for development decision-making (economic, political, institutional, cultural, and scientific) that would be conducive to including long-term concerns and environmental/social factors with the usual short-term and economic considerations. It was also to address the dynamics of development processes and, especially, to look at biases, distortions, and other *correctable* factors that currently contribute toward self-reinforcing and perpetuating negative trends. Since it was felt important to restrict the recommendations to a few key but do-able options in both these areas, the workshop did not aim to be comprehensive; rather it was aimed at pin-pointing some priority needs and illustrating some of the associated opportunities.

Case-study Issues

A practical way of addressing these questions was to take, as examples, a small number of issues (the ones chosen were food security, energy efficiency, and indebtedness) as entry points for workshop discussions. All three issues are relevant to a wide range of concerns within the environment-development nexus and, it was felt, could be used as a basis for identifying over-arching themes and commonalities both in terms of the causes and possible solution of the problems with which they are associated. Background papers were circulated to workshop participants. These set out questions aimed at focusing participants' thoughts on the linkages between the case-study topics, especially as regards their relation to particular policy goals, the relevance of the contextual setting for development decision making, and the dynamics of current development processes. Attention was drawn to the need to factor relevant actors, stakeholders, and their incentives into analyses of problem causes and solutions. How successful have different approaches to development and environmental protection been? What are the principle barriers to more successful policy-making?

Viewed against this backdrop, the workshop discussions together with the written materials supplied by participants and correspondents can be structured around three themes. The first is the need to reactivate development within developing countries after a decade of what with few exceptions has been economic and social stagnation and environmental deterioration. The second is the more general need for development (everywhere) to be more compatible with resource constraints and opportunities and, especially, with environmental conditions. The

⁷ For a statement of the difficulties involved in such a definition see Keyfitz, N. (ed.), Science and Sustainability, IIASA, 1992. In the editorial preface, Keyfitz argues that the strength of the word "sustainability", which has come to be used widely since its adoption by the Brundtland Commission, is partly that as a descriptor it forces us to pause and reflect upon the direction civilization is heading. This is no small accomplishment, especially if such reflection transcends cultures and ranks. Another element of its strength is that it has achieved such wide acceptance as a societal "goal". A factor in this acceptance is that, as a goal, it is imprecisely defined. It means different things to different people. The one common element across all users is that it connotes something good. For an attempt to look in more detail at the meaning of the word, see Harvey Brooks: Sustainability and Technology in the same volume.

third theme is the need to explore new ways of consensus-building and achieving cooperative action. Which new approaches to analyzing and representing environmental, economic, and social problems offer the best prospects for changing attitudes, building consensus, achieving participation, and developing appropriate instruments of policy? These themes are taken up in the book (in preparation) that is the major outcome of the workshop. Here, we concentrate on reviewing the three case-studies and on identifying general issues that these illustrate.

Energy Efficiency⁸

The link between energy and development has long been recognized, but predominantly as one between energy use per unit GDP generated. In this sense, the goal of development is seen as maximizing GDP and that of energy efficiency as minimizing associated energy use. Presenting international comparative and time-series data on energy use/unit GDP (energy intensity) and energy use/capita, Rainbow contrasted "the good news" reflected in these trends, with the "bad news" represented by trends in demand for energy end-use services like mobility and comfort. On a positive front, energy intensities are continuing to decline, albeit steadily. Also, developing nations are unlikely ever to experience energy intensities like the maxima witnessed in the already-industrialized countries. The "bad news" reflected in the end-use trends is the steadily upward demand for end-use services which largely takes up any energy savings achieved through greater efficiency in service delivery. Another negative inference is that there are limits to the "natural" rate of improvement of energy intensity under prevailing conditions. In the OECD countries, this improvement has averaged around a 1% reduction in energy intensity per year for the last 40 years.

Energy intensity trends

Comparing energy intensity trends, Rainbow noted marked differences between nations and blocs. The OECD countries have the lowest and decreasing energy intensities. The former centrally planned economies (CPEs) have high and increasing intensities.⁹ In part, the decreasing intensities of the OECD reflect structural economic changes (like the shift to high-technology industries and services that add-value but use little energy) as well as advances in energy efficiency per se; i.e., the energy required to deliver the same end service. In this context, Rainbow emphasized that the US, which by OECD standards has a high energy intensity and high energy use per capita, is at or near current world best practice in the efficiency of delivery of energy using services. The high level of energy use per capita in the US owes largely to structural and geographic factors and highlights, especially, the relation (and inertias) between energy intensity and the stock of physical capital/infrastructure.

These two relations - between the economic and policy context and energy intensity on the one hand and between capital stock and energy intensity on the other - have important

⁸ Arrhenius, Rainbow, and Johansson provided an overview of energy efficiency. Supplementary notes were provided by Schipper.

⁹ The CPEs use 50% more energy per capita today than 20 years ago.

implications for developing countries. Rainbow pointed out that already wide discrepancies in developing country energy intensities correlate closely with differences in their economic and policy frames. Misuse of energy is often linked to government regulatory and fiscal policies that distort prices or provide inappropriate signals. He contrasted the relative success of China in reducing energy intensities with the poor performance of India.¹⁰ Trends within countries tell a similar story; the increase in Turkey's energy intensity was reversed following economic and policy reform and the opening of its economy. That most developing countries still have opportunity to avoid infrastructures, technologies, and practices that would commit them to high future energy intensities adds to the importance of ensuring appropriate price and policy signals now.

The question of financial incentives and disincentives was taken up by Schipper in a written contribution to the workshop. His concerns related mostly to the already industrialized countries and to a discord between, on the one hand, calculated theoretical energy savings potentials and the extent to which these have actually been or are likely to be taken up. That only slow progress is being made begs several questions: "Why are people not taking up these opportunities?", "What are the real costs of making the associated improvements?", "Do we understand how the market really works?" From a strategic standpoint Schipper asks: "Is it better to cite optimistic studies of the potential for energy efficiency¹¹ or should one be more pessimistic about how much of the potential will be realized in order to mobilize more attention and resources for energy saving?"

That energy intensities of major consumer-related end uses are falling only slowly in the major industrialized countries and the rate of improvement of new systems is decreasing in part reflects that energy prices are currently low compared to their real values in 1975 or 1981. Without appropriate economic incentives and disincentives, improvements in technology will not necessarily translate to energy savings. Schipper noted that it is easy to compare two energy using systems with different energy requirements, compare the cost of building the more efficient versus the less efficient, and forecast the potential for energy savings. In practice, however, the situation is more difficult. The extent to which the theoretical saving will actually be realized depends upon whether the increased efficiency (and, therefore, the lower running cost), will in turn stimulate extra demand. There is clear evidence that for some end-uses (especially air and auto travel) greater efficiency stimulates greater use. If prices are low, what other mechanisms will deliver real energy savings?

Schipper's observations and questions suggest that the prevailing policy and economic climate in the already-industrialized countries is not conducive for a rapid take up of energy savings potentials and that new policies and resources would be needed *if* quicker progress is deemed

¹⁰ Rainbow commented that generating efficiencies in India are particularly low compared with current best practice in other developing countries. This relates, in part, to government insistence on contracting equipment from local suppliers. The monopolies thus created translate into high equipment costs and poor manufacturing tolerances. It is the latter that accounts for poor generating efficiencies.

¹¹ An example would be the studies from the Rocky Mountain Institute that suggest an energy savings potential of 75%.

necessary. But, how much emphasis should be given to energy-savings policies in industrialized countries? This is no easy question. It is common for climate scientists, for example, to ask energy analysts where fossil fuel use is headed in order to calculate incremental greenhouse gas emissions. The scientist might then suggest restraining the growth of these emissions. How much restraint is required is, of course, a matter of judgement as well as an economic question. If energy demand is growing rapidly, then most would agree that large reductions in, or massive restraints on, greenhouse gas emissions are desirable. But the last few units of reduction/restraint could be very costly. How much these last few units are worth is questionable. If only a mild deviation of demand growth is thought necessary, then the costs might be invisible. But how much efficiency improvement will happen anyway? This question is important since much policy activity is aimed at incremental energy savings.

Alternative definitions of "efficiency"

Schipper's comments on the relation between energy use and the greenhouse gas issue introduces the environmental rationale for advocating greater efficiency. In the energy-intensity measure of efficiency, there is no question of any ceiling on energy use imposed by the capacity of the environment to absorb waste products of energy conversion. So long as energy intensity is decreasing, the total energy consumption of the economy and its GDP could, under such a definition, increase indefinitely. In short, the definition sees no contradiction between greater energy "saving" on the one hand, and greater overall energy use on the other.

Alternative definitions proposed by Arrhenius introduce notions of risk and beg the questions: "What is the real role and purpose of energy saving?", "What is development?", and "Who does it benefit?" These include:

- i) that energy used per unit CO₂, or NO_x, or SO₂-released should tend to infinity
 - ii) that energy used per unit risk should tend to infinity
- and, iii) that energy used per unit life quality attained should tend to zero.

Each of these different definitions would place the quest for greater energy-efficiency in the context of a different overall objective and, from an operational viewpoint, would lean toward wholly different policy measures. As such, energy-efficiency appeals to several, often-conflicting interests. While some of these are consistent, others could be at variance with some perceptions of "sustainable development".

By way of illustration Arrhenius cited three examples in relation to climatic change. If our aim is to reduce the rate of climatic change can we automatically assume that any change that increases the efficiency with which energy is transformed, transported, or used will take us closer to this goal? Heat pumps are highly efficient energy converters; but for lubrication reasons they are mostly designed deliberately to leak chloro-fluoro-carbons (CFCs) which are far more potent greenhouse gases than CO₂. Would we also be correct in assuming that hydropower schemes are preferable to fossil fuel plants on greenhouse gas grounds? Arrhenius cited an example of a hydroelectric scheme in Brazil where, in creating the

reservoir storage, a forest had been flooded. The resulting anaerobic decay of organic matter had begun to release methane, a much more potent greenhouse gas than CO₂. The potential contribution of the scheme to the atmospheric accumulation of greenhouse gases had been calculated to be the CO₂ equivalent of 300 years' operation of a conventional coal-powered plant of the same generating capacity. His final example was the reverse situation. Can we automatically assume that an increase in CO₂ emission is necessarily bad? There are many instances in which natural gas is flared at the well head and, also instances where this practice is banned. While not advocating flaring, this is certainly to be preferred if the alternative is for methane to be vented.

Solutions or goals?

Arrhenius drew several conclusions from these simple illustrations. It becomes of utmost importance to be precise about which goals it is really wanted to achieve and to fully evaluate different practices upon the goals in question. It is not clear that energy efficiency or a reduction of CO₂ emissions is an adequate surrogate for our goals in all circumstances. Arrhenius remarked that this would not be so significant but that, institutionally, we have become locked into particular mindsets about what is good or bad. Dogma is translated into policies that preclude or require certain types of action. Although intended to safeguard the environment, these often become obstacles to effective protection. Arrhenius concluded that we must shift from the current tendency of prescribing solutions to one of specifying clear goals. There are many possible ways of achieving our goals. What is best depends upon the prevailing circumstances. We need to recognize this by building greater flexibility into policy making and our institutions.

Arrhenius argued that the "goal" of energy efficiency is part of this dogma. Energy efficiency per se is not a goal but a means to particular ends such as a reduced rate of production of acidifying, toxic, or climate-relevant substances. Each of our real goals can be reached by several means. Some are more effective and cost-efficient than others. Increasing the efficiency of energy use represents only one of several plausible strategies. Our difficulty in effective and pragmatic policy making is partly one of mindset and institutional inertia. Policy makers and scientific advisors focus on "problems" and persistently seek solutions that are defined in the same terms as the problem. We are locked into a paradigm that, from the outset, rules out what are often the best opportunities for creative problem solving.

Arrhenius used the potential greenhouse-gas-induced climatic change to illustrate his point. The problem is defined as the release of substances to the atmosphere that would otherwise remained locked in the fossil carbon store. The release is through economic activities that require energy. Within the confines of these elements there are relatively few policy variables. It is hardly surprising, then, that scientists and policy-makers focus on the rate of energy use and resort to principles such as the polluter pays (the PPP). By placing the problem into its wider perspective, the narrowness of this approach becomes immediately apparent. Within the Earth system as a whole, relatively little carbon is held either within the atmosphere or the fossil reserve. By casting the problem as involving interchange between these two reservoirs we ignore at least three other reservoirs - the biosphere, geosphere, and oceans - that together account for 80% of the overall carbon store.

Our focus on the 20% constrains the range of potential solutions. We see carbon build-up in the atmosphere as a problem. We fail to see that by reversing another ongoing process - the depletion of carbon in soils - we have potential to harness atmospheric carbon to productive ends. Through changes in agricultural practices, the average biomass content of soils has been reduced from 8% to less than 1%. Under traditional agricultural practices, maintaining a high organic content was a soil management goal. These practices were lost as a result of the changed economic rationality created by artificial fertilizers and subsidies for mechanized farming. Were we to revitalize these practices, which would be good for the soil, a large part of the carbon now being added to the atmospheric store could be removed. A doubling of the soil organic content over a 100 year period - a rate of increase of less than 0.01% per year - would take up over 3 gigatonnes of carbon per year. Were it not for artificial constraints introduced by mindset and principles such as the PPP, carbon sinking could be seen as a service for which farmers would be paid.

The greenhouse gas problem provides a further illustration of wrong focus. If our concern is to retard potential climatic change how much policy attention should be given to the energy sector? Certainly, energy use is the single biggest factor in the build-up of atmospheric carbon, but CO₂ is not so potent a greenhouse gas as methane. From a climatic perspective, it is far more important to control methane emissions, especially if the time horizon of concern is, as is most probable, the medium-long term (i.e., the term that corresponds most closely with the atmospheric residence period of methane). This might switch the focus of attention at least in part to agriculture. But even here, we commonly focus on methane-generating food production processes such as paddy rice and livestock farming. Almost totally overlooked is that only 20% of the biomass annually produced from agriculture is food. The rest is organic waste. From a climatic change perspective, whether the carbon within this waste enters the atmosphere through aerobic or anaerobic processes (i.e., as CO₂ or as methane) is more critical than either the climatic change effect of marginal savings of oil and coal in countries already at the leading edge of energy-efficiency or of any feasible changes in agricultural production practices.

How waste is treated is a major, neglected factor. It is also one which has enormous potential for giving effective and cost-efficient returns. In many developing country cities, organic waste is simply heaped and allowed to rot. The organic content is decomposed under anaerobic conditions, releasing climatically-potent methane. In Bangkok alone, 2,500 tonnes of biowaste is collected daily. More than half decays anaerobically. A constructive possibility would be to collect the methane as an energy source. Burning would convert the methane (CH₄) to carbon-dioxide (CO₂); another example where, perversely, an increase in CO₂ would be environmentally beneficial. Biogas programs are commonly dismissed out of hand because, it is argued, there are always methane leakages and even a 5% leakage would leave conventional fossil fuels such as coal or oil the better alternative. The real question, however, and the one for developing pragmatic policy responses to the climatic change question, is not how biogas programs compare with conventional fuels but how they compare with the current practice of piling waste in heaps. A 5% leakage of CH₄ along with conversion of the remaining 95% to CO₂ is a far better mix than a straightforward escape of methane. It also provides low cost and easily-accessible energy.

A final example from the climate change perspective takes us back to the energy sector and the problem of methane leakage. Both Arrhenius and Rainbow could cite examples of egregious energy wastage involving leaks of methane. Rainbow cited the case of India where bans on flaring natural gas at well-head and bore-hole, coupled with government policies that hold the price of gas so low as to make it uninteresting to capture, mean that gas is allowed simply to escape to the atmosphere. Losses through venting in India are equivalent to half of Pakistan's total energy needs. Arrhenius quoted leakage estimates from gas pipelines in the former Soviet Union, the US, and Europe.¹² Export pipelines from the former Soviet Union, built hurriedly to meet foreign currency pressures, are poorly sealed. They are variously estimated to leak with up to 30% losses. This is the greenhouse gas equivalent of the former Soviet Union's entire CO₂ emissions.

In the former Soviet Union, the prevailing economic and political frame permitted these losses. Gas prices were held artificially low; gas leaks were permissible and affordable. But this does not explain losses in the US or Europe. Here, another factor is relevant; the common tendency to neglect to maintain infrastructures. Leakages on the scale cited are technologically inexcusable in that pipelines can be made and maintained to much higher standards. It is common for planning authorities and financial institutions (including on the development scene, the World Bank) to attach too little importance to infrastructure maintenance. Arrhenius considered this a significant additional bias.

Current approaches

How do the sample solutions listed above compare with current approaches? Arrhenius continued with the greenhouse gas illustration. He noted that some analysts have suggested capturing CO₂ at generating plants so that it can be dropped into the deep oceans. This is both costly and energy-inefficient. Where is the return on such a solution? Does it address the most significant elements of the greenhouse gas accumulation problem? In CO₂-equivalent terms, are reductions being achieved in the most cost-effective way? Better, he argued, to focus on solutions that yield returns across more than one front. Securing pipelines against gas losses, capturing biogas, and measures to capture gas now vented, all save energy *and* retard climatic change. Moreover, they are all relatively simple solutions to effect. Encouraging farmers to use soil as a carbon sink will improve long-term fertility, reduce dependence on artificial fertilizers, reduce soil erosion *and* reduce the rate of climatic change.

Such win-win solutions are not confined to the greenhouse gas issue. Taking the acidification problem as another illustration, Arrhenius questioned the sense of prescriptive approaches that require, for example, Polish generating plant to be retro-fitted to meet European emission standards. Is it pragmatic to use scarce financial resources to upgrade obsolescent plant that should be taken out of service anyway? Conformity with European emission standards would require scarce financial resources to be wasted. But significant reductions in Polish emissions

¹² A recent study from an independent research organization has challenged the official estimates of losses from British gas pipelines. The study claims the official figure, ca. 1%, to be a significant under-estimate. The study places average losses at ca. 8%. Much of the loss, the study claims, owes to using old, town-gas pipelines to transport natural gas which, being dryer than gas manufactured from coal, causes seals to crack and leak.

could be achieved by taking one old plant out of service and concentrating whatever money would have been spent on retrofitting to build one efficient new plant. The result would be greater generating efficiency, lower maintenance costs, more reliable generation, *and* reduced acidification.

Turning to energy prices, Rainbow challenged both current policies that subsidize energy and ill thought-through suggestions for introducing a carbon-tax. He cited several developing countries where electricity, coal, and kerosene prices are held below production costs as a matter of policy. As well as encouraging waste, such policies deprive utilities of the revenues needed for re-investment. If we now think of introducing a carbon tax (rather than a "greenhouse gas tax", or an "environmental externalities tax"), we could introduce even greater distortions. A tax based upon the relative carbon content of alternative carriers would favor natural gas over oil, and oil over coal. But this assumes that the fuels are burnt. If gas escapes, as it does, its contribution to the greenhouse effect is much greater than either oil or coal for the same delivered energy. By focusing wrongly on carbon emissions rather than on greenhouse gases, as many analysts and policy makers are now doing, we could end-up with the least environmentally-damaging energy carrier being the heaviest taxed and the most-damaging being subsidized.

The question of appropriate pricing for different energy carriers is far from simple. However, it is clear that distortions introduced by government should be removed before tackling infinitely more difficult questions of appropriate energy taxation on environmental grounds. Although there are exceptions¹³ that will demand careful analysis and sensitive policy-making, there is enormous scope for reducing profligate energy use, waste, and environmental damage, increasing the revenues available for re-investment, and challenging unrealistic pressures for perpetual energy supply expansion.

As a final illustration, Johansson took up this last point and challenged current policies aimed at expanding energy production in developing countries. Disparities between rich and poor in developing countries and between these countries and those already-industrialized are widely seen as reasons for increasing the level of energy services to those inadequately served. Johansson argued that decision makers persistently translate this need into a mandate for increasing commercial energy production. Coupled with population growth, this approach has led to a near linear rise in energy consumption. Continuing this path is neither realistic nor affordable. To the end of the century, the World Bank estimates that around US \$200 billion is likely to be available for all development purposes from multilateral funding sources (i.e., ca. US \$20 billion per year). Judged against this, the World Bank's estimate of developing countries' capital need within the electricity sector alone over the corresponding period - a trillion dollars - is sufficient evidence that expansion of energy supply on the scale envisaged in national energy and development plans is unrealistic.

¹³ For example when the threshold of substitution is between commercial and non-commercial carriers. Should kerosene subsidies be removed to dissuade profligate use and avoid dysfunctional investment? What would be the likely environmental consequence of removing the subsidies? For the poorest, the likeliest alternative to subsidized kerosene would be fuel wood and, since it is virtually impossible to control access to forests, the result would be increased deforestation and soil erosion pressures. Since fuel wood is seldom burned efficiently, removal of subsidies would likely also increase energy intensities. This suggests the need for cautious and sensitive policy-making.

That energy production *per se* continues to be seen as a goal in itself was cited by Johansson as *the* basic obstacle to achieving real increases in living standards and environmental protection in developing countries.¹⁴ It also leads to an unnecessary confrontation between industrialized and developing nations over the priority ascribed to averting climatic change through build-up of greenhouse gases. By mixing efficient end-use technologies with modest increases in energy supply and generating capacity, most developing countries could affordably obtain the energy they need without damaging the environment. Johansson argued that in a capitally-constrained world, the question of translating an energy savings potential into a real increase in the delivery of final energy services is more than merely one of conservation or of reducing the rate of build-up of greenhouse gases. It is the only viable development strategy for developing countries.¹⁵ This makes it the ultimate win-win strategy.

Food Security¹⁶

In discussions of food security and insecurity,¹⁷ it is important to separate famine - usually a catastrophic but transient event affecting a nation or regions - from the situation of chronic

¹⁴ If current trends persist, developing countries would consume as much energy in 20 years time as the industrialized countries consume today; but because of inequities and inefficiencies in energy consumption, it is argued by Reddy and Goldemberg that the gap in living standards between rich and poor would not diminish (Reddy, A. K. and Goldemberg, J., 1990, *Energy for the Developing World*, in Scientific American, September 1990).

¹⁵ The detail of this analysis is given in Goldemberg, J., Johansson, T.B., Reddy, K.N., and Williams, R.H., Energy for a Sustainable World, Wiley Eastern Ltd., 1988. Much of the argument pertaining to developing countries is restated in Reddy, A.K. and Goldemberg, J., *Energy for the Developing World*, Scientific American, September 1990. Developing countries are almost all dual societies with minority elites and a mass of poor people. These two sections of society differ fundamentally in their use of energy and in the environmental impact of their energy use. The rich lead life-styles and have associated energy consumption patterns more akin to those of industrialized countries. The poor - who often lie outside the money economy - rely on non-commercial energy carriers (animal traction and biomass) and highly inefficient conversion and end-use technologies. Fuel-wood is the dominant energy resource in rural areas and cooking the most energy-intensive activity. Developing countries' overall energy use per capita is low in comparison with developed countries; but the delivery of energy services (lighting, cooling, heating, mechanical power, etc.) is even lower owing to the inefficient delivery of end-use devices (such as lamps, refrigerators, stoves, and carts.). This gives considerable scope for increasing the delivery of energy end-use services without increasing the supply of energy.

¹⁶ Heijig and Kebede provided an overview of food security, supplementing McNamara's written comments (R.S. McNamara, *Africa's development crisis: agricultural stagnation, population explosion, and environmental degradation*, a revised version of a paper first presented to the African Leadership Forum, 1990).

¹⁷ At least five elements implicit within the term *food security* are reflected in the literature. These relate to: i) the composition (cereals versus non-cereals) and nutritional adequacy of food to sustain an active life; ii) "who" is secure in terms of food availability (eg., a country, a household, a person, the poor); iii) whether "security" (i.e., the assurance of access to food as needed) is expressed as physical supply-based assurance, effective real income demand-based assurance, or both; iv) whether food insecurity is transitory or chronic and whether consumption levels are sustainable as population expands; and, v) linkages with the developmental and political needs of the country (i.e., with national security more broadly), and of the individual (such as guarantees of the right to work for reasonable wages).

malnutrition now endemic in many developing societies. The former is usually caused by crop failure brought about by abnormal physical conditions or by political and social unrest that disrupts normal farming practice. Sudden large movements of displaced people can easily outstrip the food producing capacity of receiving areas. The worst consequences of catastrophic famine, like that now being experienced in the Horn of Africa, can be lessened by international relief efforts including the distribution of food-aid; at least, so long as political conditions allow such aid to be distributed. By contrast, endemic food insecurity is symptomatic of development failure. This latter formed the focus for workshop discussions.

Aggregate issues: food demand and supply

Kebbede distinguished between the aggregate food demand/supply issue and that of entitlement to food or agricultural resources. The distinction, he argued, is critical in reviewing approaches to rural development in developing countries. Although there are exceptions, there is little question that *present* food insecurity is far less a consequence of any environmental or technological constraints on production than of prevailing social, political, and economic structures.

If stocks of food are taken into account, there is no aggregate food deficit. World grain production has been quite stable around trend, with a variability averaging only 1.5 percent over the past 40 years. At macro-scale, weather and physical factors are by far the largest source of variability, but global production is also affected by regional and (in some cases) more localized events, notably war. At regional and sub-regional levels, war, civil strife, and misguided policy act alongside physical conditions such as weather and lack of critical inputs in creating production deficits. But it is invariably these human dimensions that are responsible for translating local shortfalls into malnutrition or famine.¹⁸

In the face of shortfalls, the focus of food security switches to international and national food markets. Then, questions of price level and stability take over from those of production. Price variability is much higher in world markets than in the domestic markets of most countries. Agriculture and trade policies in developed countries and food price policies in developing countries insulate producers and consumers from supply shocks. But the insulation forces adjustment onto a thin world market and magnifies the price effect of otherwise small production shocks. This especially affects poorer countries and people since it reduces their ability to rely on world markets for food security. Sensitivity to price thus becomes a crucial component of food security adjustments.¹⁹

¹⁸ Examples cited by Heilig include Angola, Uganda, Campuchia, and China. Cereal production in Angola declined over the 30 year period of the civil war. In Uganda, commercial agriculture broke down under the Amin regime. There was no physical limitation on production in Uganda, which is especially favorable for agriculture. It should be noted that during the Amin regime, subsistence production continued and provided the mainstay for the population during this period. Before the war in Campuchia and control by the Pol Pot regime, the country was a net cereal exporter. It is estimated that the single most serious case of famine (30 million deaths) occurred in China as a result of policies pursued during the Great Leap Forward.

¹⁹ See, for example, Wolf, 1991.

This draws out the distinction between food need and effective demand. Effective demand requires the capacity to pay for food. Since commercial agriculture responds to effective demand, the dietary preferences of the more affluent may be met at expense of the basic food needs of the poor. Kebede argued that, unlike *energy efficiency*, food security is, or should be, a policy goal. The basic problem is that, often, it is not. It is subordinate to the goal of bulk crop and livestock production. The two are not the same. Food security does not necessarily require a region, nation, or household to be food self-sufficient. That Japan and many Middle-Eastern oil-exporting nations are net food importers is illustration in point. But neither is food self-sufficiency at the aggregate (regional or national) level any guarantee that all societal members will be free from hunger.

Kebede cited trends in India and Brazil to illustrate these points. Food production in India has increased faster than the rate of population growth over the last 20 years. India now has a food surplus and a cereal reserve of 13 million tonnes. But the number of food insecure Indians has not decreased. There are still 300 million households in India on the verge of food insecurity. In Brazil, the number of food insecure, especially in urban areas, is growing rapidly. But the emphasis of agricultural production is on exports. Production of staples such as rice and beans has declined while that of subsidized export products (beef, frozen orange juice, soya, and chicken) has increased.

Clearly, food security is more than merely a matter of aggregate demand and supply. The issue raises questions over control of agricultural resources and products, food prices, and the distributions of income, wealth, and employment opportunities both between and within countries. But does that mean that there is no problem at the aggregate level? That world food production has increased to more than offset the impact of rapid population growth is an achievement almost unthinkable in the late 1950s when most analysts were projecting a major discontinuity.²⁰ But how does the picture appear as we come to the end of the century? The achievements of the green revolution have allowed populations to continue growing, but are we falsely secure in believing output growth can be maintained?

Future food production: optimism versus pessimism

Heilig took the optimistic line that there remains considerable scope for intensifying agriculture in the poorest countries using only existing technologies. He cited agricultural intensification in Asia as a case in point. During the 1950s and 1960s, Asia was widely predicted to be the region of greatest potential food insecurity. Since then, the Asian population has doubled but food production has tripled. Heilig was optimistic for the most critically food-insecure nations, such as those of sub-Saharan Africa, because they are so far behind in technology and yield that relatively simple management strategies could deliver major productivity gains while conserving the resource base. As for the richer countries, the direct link between basic inputs (land, energy, water, etc.) and food production is already broken. In the Netherlands, for example, although high levels of *artificial* inputs are used, production at the margin is being increased largely through soft, knowledge-based inputs.

²⁰ The former Director of the Food and Agriculture Organization, John Orr, was widely quoted throughout the 1950s and 1960s, as predicting a lifetime of malnutrition and hunger to be the lot of two-thirds of mankind.

By contrast, Durning and Ayres suggested that on a combination of technical and environmental grounds we may be reaching a turning point in the production growth curve. Extensification of conventional agriculture is no longer possible and annual increases in irrigable land are already offset by losses through salination and waterlogging. As for further intensification, there is no longer a backlog of new green-revolution technologies upon which to draw, plant breeding technologies appear to be approaching natural limits,²¹ and the environmental costs and "sustainability" of the green revolution are unclear. The natural gene reservoir is being eroded, pest species are becoming immune to commercial controls, and world agriculture will be influenced by global scale environmental changes now underway.²² Were it possible to produce food for 10, 15, or 20 billion people, what would this imply for the environment? Were we to depend upon current commercial farming technologies, these would rapidly degrade the natural resource base.

In particular countries and regions, populations are expanding faster than agricultural productivity; this demand component gives added cause for concern. Of 104 developing countries examined between 1961 and 1983, 16 had negative food production growth rates but 65 had negative *per capita* production growth rates.²³ Where population growth is accompanied by increasing levels of per capita income, food demand will grow even faster so that the distribution of income across the population becomes even more critical as a factor influencing household and individual food security. Referring to the food-feed relation, Keyfitz commented that an increase in GNP/capita, if not accompanied by changes in income distribution, can actually increase the amount of hunger.²⁴ The in-built dynamics of population growth imply that, even assuming the success of birth-control programs now in place and a continuation of current trends of fertility decline, population will assuredly increase. The latest UN projections assume a doubling of world population by the year 2030. Durning noted that the aggregate food balance may already be tipping in the negative direction. Over recent years, world food stocks have been declining. In effect, over the last three to four years the world population has annually consumed more food than has been produced.

²¹ Ayres remarked that many cereal crops have been bred to a point where the grain already constitutes 50% of the plant weight.

²² The Intergovernmental Panel on Climate Change concluded that food production at the global level could be sustained at levels sufficient to meet world demand under the test-case conditions of a 2xCO₂ scenario, but that the cost of achieving this remained unclear. Parry et al, have looked at possible climatic change impacts upon agricultural systems and agricultural productivity in currently marginal producing regions. See, Parry, M. L., Carter, T. R., and Konijn, N. T., The Impact of Climatic Variation on Agriculture, Vol. I, Assessments in Cool Temperate and Cold Regions; Vol. II, Assessments in Semi-Arid Regions, Kluwer (Dordrecht, The Netherlands) 1988.

²³ Ezekiel

²⁴ As described by Sen.

There is good evidence that population growth rates tend to slow as incomes rise,²⁵ that new and non-conventional food technologies (such as fermentation techniques and gene-manipulation) hold promise of improving overall food supply and nutrition, and that there is spare capacity in the calorific balance of diets among richer peoples and countries (whose preference for animal proteins diverts a large proportion of primary grain production to animal feed-stock). Nevertheless, all three factors involve time lags that may mean disequilibria (in practice, increased prices) at world and national levels. This would add to the already-high levels of household and individual food insecurity among the poor. If, as has been suggested, there should be an internationally accepted right of all people to be free from hunger,²⁶ what is the concomitant responsibility? Keyfitz raised whether this should not include the responsibility to limit family size.

A paradox: greater food production can mean less food security

Why does hunger persist when there is no aggregate food deficiency? More especially, why does it persist even in countries capable of meeting their own food needs? Kebbete argued that, paradoxically, bulk crop and livestock production and approaches to rural development that promote these are partly to blame. Many small farmers are short-changed by prevailing socio-political and economic structures that promote export agriculture rather than food security. Even where "green revolution" technologies are appropriate, they are seldom accessible by small farmers to increase food production for domestic consumption. The export orientation of commercial farming means that although food is produced, production is not aimed at meeting domestic food needs.

Several studies have revealed a rich variety of traditional agricultural technologies throughout Asia, Africa, and Latin America.²⁷ These technologies were sustainable so long as the scale of operation remained small. As scale of production increases, labor-intensity goes down. For Arrhenius, this is the most significant problem on both ecological and social grounds. The lower labor intensity drives out the more sustainable farming methods. He contrasted commercial rice growing with methods used in China. Commercial rice growing uses large quantities of pesticide and fertilizer inputs. It also leaks residues and methane to the environment. The ecosystem is no longer a closed cycle. By contrast, the Chinese system of rice growing is labor intensive and highly managed - but it remains essentially a closed ecosystem in which those who work are an integral part. The Chinese system is ecologically-sound *and* maintains employment.

²⁵ See, for example, Keyfitz, N., Population growth could stop the development that would stop population growth, IIASA, 1991.

²⁶ See, for example, Den Bosch Declaration, Food and Agriculture Organization, 1991, as reported in UNCED PrepCom A/CONF.151/PC/61.

²⁷ A study by Richards, for example, listed over 100 different ecologically-compatible technologies applied by growers in Northern India.

The concentration of landholding that goes with commercial farming displaces subsistence-farmers and smallholders, depriving them of a livelihood. Durning reported recent research²⁸ demonstrating the overlap between areas of severe environmental degradation and extreme poverty. The most fragile lands - rainforests, steep slopes, arid/semi-arid lands, wetlands, etc. - are the last fallback resource of dispossessed peoples. There they put pressure on traditional resource management systems²⁹ that are sustainable only at low levels of exploitation; the extra pressure tips the balance and begins a rapid downward spiral where economic impoverishment, hunger, and environmental degradation all feed on each other. Very often the people involved are fully aware of what is happening. The degradation is not from ignorance, but from lack of options.

Arrhenius used the relation between environmental degradation and food security to raise the counterpart, the relation between a better environment and food security. It is no accident, he argued, that the possibility of working with an ecosystem to achieve several goals simultaneously is generally overlooked. Current approaches to agriculture and food production rely on only a small number of commercial animal and plant species. These are used everywhere, irrespective of the characteristics and natural diversity of the ecosystems to be developed.

As one example of unsuccessful "ecological engineering", Arrhenius drew on experience in Africa with the Nile Perch, an introduced commercial fish species that displaced the native Tilapia and, through a succession of feedback relations, led to eutrophication of rivers, the near extinction of both fish species, over-fishing, food insecurity, and deforestation.³⁰ He argued that the commercial development of agriculture and fisheries largely ignores existing knowledge of ecosystem function and resilience, which could be used productively together with more innovative approaches to ecosystem development.³¹ It is this separation between commercial agriculture and an approach that asks, "what could this ecosystem provide us with?", that threatens discontinuities.³²

²⁸ A. Durning, Poverty and Environmental Degradation: Reversing the Downward Spiral, World-Watch, 1990.

²⁹ For example, shifting agriculture in South America and nomadic pastoralism in the Sahel.

³⁰ The Nile Perch displaced the Tilapia which normally controlled the growth of oxygen-using organisms. This led to eutrophication and die-backs of both perch and tilapia. The shortage of fish led to increased prices and over-fishing of remaining stocks. Owing to the high prices, catches were sold rather than used for subsistence. High prices and distance to markets meant fish had to be preserved by smoking. This needed fuel-wood and increased deforestation pressures.

³¹ Such as that represented by adaptive environmental management. See, for example, Holling, C. S., Adaptive Environmental Assessment and Management, Wiley International Series on Applied Systems Analysis (Chichester, UK), 1978, and Walters, C., Adaptive Management of Renewable Resources, MacMillan (New York, London), 1986.

³² Discontinuities associated with our reaching physical resource constraints in agriculture, such as limits on available fresh water in the Middle-East and the Sahelian region of Africa. See, for example, Shaw, R., Gallopín, G., Weaver, P.M., and Öberg, S., Sustainable Development: A Systems Analysis, IIASA (Laxenburg, Austria), 1992.

As with *energy efficiency*, Arrhenius considered mindset to be a major obstacle to better development. The prevailing mindset is to look at an area as a basis for agricultural production rather than to question what needs to be done to provide food security, good hydrology, soil conservation, employment, and carbon sinking. Very few ecosystems that are manipulated for commercial crop, livestock, or fish production are based on such a rationale. Had the question been asked in the way suggested, there would have been greater resistance to the general market-oriented push for bulk crop production.

Current approaches

Against this backdrop, how appropriate are current approaches to rural development? The principle actors are the respective national governments, international aid and financial institutions, and agro-industry. Kebede emphasized that current policies of all three continue to stress green-revolution technologies, bulk crop production, and an export orientation. The implicit assumption is that technology is the missing element in successful development. To the extent that social and political questions are considered, the assumption made is that new technologies and greater production are prerequisites for social and political reforms rather than vice versa.

Government subsidies, tax breaks, and loans are provided to boost commercial rather than small-scale farming. Under austerity and economic reform programs, the World Bank has encouraged governments to remove food subsidies arguing that increased prices will stimulate greater production. But there is little evidence that increased production will necessarily improve food security so long as the poor lack gainful employment. Often overlooked is that a significant proportion of the rural- as well as the urban- poor are net buyers of food. In many developing countries, the poor no longer derive any direct income from agriculture. The poorest can easily be priced out of the market, reinforcing the bias toward production for export.

Under pressure from subsidized export-oriented production, peasant farmers continue to be displaced into marginal areas. Durning noted that although some success has been achieved with new crop rotations, agro-forestry, and organically-based plant nutritional systems, such solutions for smallholders in fragile areas are likely to have only marginal impact until the forces giving rise to the flow of dispossessed peasants are themselves tackled. This depends upon a more even-handed development approach in which the poor are brought up more quickly with the better off.

Some help in these areas could come from bio-technology, but genetic research is dominated by those same agricultural companies responsible for developing commercial agriculture (combination packages of compatible seeds, insecticides, fertilizers, etc.). Their commercial interests lie more in developing herbicide-resistant strains of commercial crops than in strains suitable for use in labor-intensive, integrated- cropping regimes for marginal areas. At issue is how to harness the technical resources of these companies to alternative ends.

Linking up with the energy efficiency case, Arrhenius criticized current calls for wide-scale reforestation in developing countries as another example of the extreme, prescriptive, eco-

engineering approach. While some ecosystems are well suited for reforestation and there are others where tree species may have a valuable role, reforestation is neither generally suitable nor an appropriate and cost-effective way of carbon-sinking. Requests for giant reforestation programs should be rejected pending proper assessment of the needs and opportunities afforded by the ecosystems in question.

This raises the question of appropriate assessment. From past experience, as illustrated by the Nile Perch example, there is need for caution if what is planned is likely to introduce alien species or induce new patterns of social behavior. If development is to be more sensitive to local conditions and needs and is to draw upon established traditions and skills, projects must be judged on these criteria. Reinforcing this point, Kebede drew an important distinction between the rich diversity of ecosystem types and cultural traditions in the tropics and the ecological and cultural homogeneity associated with, for example, the Great Plains. What was a successful formula for farmers in Ohio or Kansas could be easily and successfully transferred to other states. In tropical regions, prescriptive solutions are likely to fail in the face of local variation. The same can be said for most top-down approaches. For rural development to be sustainable, it must be compatible with local social and ecological conditions. This implies that it must involve local people and local knowledge.

Pragmatic alternatives

Calls for radical restructuring of developing country societies or the international economic order are far-fetched. The pragmatic approach, Kebede argued, is to look for less radical but workable alternatives. The basic obstacle to a rural development pathway that meets the needs of the poor is that the poor are excluded from political processes and neglected by those in power. This begs the questions: What can be done to encourage a refocusing of rural development efforts in favor of the poor? What incentives could be offered for better governance? What changes would bring long term improvements?

Part of a solution, Kebede argued, is to use the leverage provided by indebtedness and dependence on foreign aid. In the post cold-war context, more objective criteria than previously used could be applied to the granting of aid and debt relief. Since efforts to establish food security will not succeed unless food security is made a policy priority, this should be a key criterion. To support this, indicators of food security should be built up from the household level and a nation or region declared food secure only if all households within it are food secure. Debt relief can also be used to promote environmental protection, more even-handed development, and greater efficiency. The debt-for-nature concept could be expanded so that relief is made conditional upon developing countries' willingness to invest in soil and water conservation, protection of existing forest areas, wildlife protection, and improved energy efficiency. Where women play a pivotal role in food production, debt relief and aid could be conditional upon measures to enhance women's educational opportunities, the provision of family planning and health services, and measures to increase women's control over agricultural resources. This would also help to reduce population growth rates. Similar leverage and criteria can be applied to eliminate inefficient parastatals and establish enabling institutions such as a free press and mini-bank facilities that will make loans to smallholders.

Nonetheless, the means for ensuring better rural development do not lie entirely within developing countries. Better development depends also upon the approach taken by international financial institutions such as the World Bank, and the policies of multilateral and bilateral aid donors. Kebede and McNamara both argued that there is need to increase and re-channel development aid and overcome the institutional biases of multilateral and bilateral lenders and donors. On the basis of past evidence, aid has not appreciably improved human and environmental conditions. Most has been spent on highly visible, large-scale projects (high-dams, nuclear power plants, etc.) which have little relation to the basic needs of the majority and are not justifiable in terms of development priorities. Policies of donors and lenders still promote technologies that are capital-intensive and labor saving, rather than capital-saving and labor intensive; use imported inputs and have an export orientation rather than create the necessary backward and forward linkages to invigorate development; and use commercial energy sources rather than local and renewable sources.

What do these comments imply for pragmatic policy-making? Kebede argued that the principle constraints are neither environmental nor technological but institutional. The practices of national governments, donors, and lenders need to be adjusted so that rural development might better fit with environmental and human conditions. The practices of development assistance and transfer of technologies need to be re-examined. Aid programs need to be realigned to benefit the smallholder sector with particular emphasis on food production, employment creation, and environmental restoration. Channeling assistance through nongovernmental organizations (NGOs) that are recognized (and can be monitored) for their effectiveness in helping the small farmer at grassroots level will do away with costly bureaucratic intermediation of donors and recipient governments as well as much of the danger of corruption. NGOs and developed country citizens could be mobilized to urge their governments to ensure that aid is used efficiently and effectively.

Indebtedness³³

At the end of 1990, the developing countries' combined debt had risen from its 1982 level of US \$830 billion (the level at which the debt crisis first broke) to US \$1,340 billion. Whether warranted or not, high profile is given to the problem of indebtedness in political and academic discussions of environment and development. One of the issues for the workshop was to question how justifiable this is. But Weaver also noted that, in either case, the origin of the debt crisis provides valuable insights into the dynamics of development processes in developing countries, especially in relation to questions of capital formation and use. The lessons that can be learned from the phenomenon of general non-performing debt have important implications for future development. Also, several innovative debt-relief strategies illustrate how a problem, like debt, can be used creatively and constructively to provide for better development.

³³ Weaver, Ayres, and Sagasti provided an overview of the issues surrounding indebtedness and its relation to capital formation and investment. Background papers on these questions were supplied by Tropp and Shilling.

Is debt a prime cause of unsustainable development?

Even though the principle of co-responsibility is now widely accepted in discussions of the origin of the crisis, these are generally emotive and acrimonious. They are often phrased in terms that suggest neo-colonialism in the relation between debtor and creditor. In so highly-charged a debate, there is special need for clear thinking to separate the causes of the problem - which must be tackled to reach a long-lasting solution - from the vast array of indisputable and disturbing features of the debt syndrome. At issue is whether debt is a prime cause of the poor development performance of indebted developing countries or, like that poor performance, is a symptom of some more basic disorder. If the former, debt relief would be a powerful instrument of development policy in its own right. If the latter, it would be misguided to expect that debt relief as a stand-alone measure could either restart development or ensure that development is compatible with environmental and human conditions.

In a written contributions to the workshop, Shilling argued that debt problems may not be the root of all evils so far as developing countries are concerned. He notes that a number of developing countries (mostly in Asia), managed to sustain reasonable growth rates either without accumulating large debt burdens, or by carefully managing their debts. There were countries that borrowed effectively to facilitate needed policy adjustments, or avoided excessive borrowing, or borrowed to help recover from past mistakes (e.g., South Korea, Thailand, and Turkey respectively). He reflects that where there are debt problems, these stem from essentially the same causes as the negative effects often attributed to debt. These more fundamental issues have to be addressed if there is to be lasting progress on debt, the environment, or equity.

Shilling argued that the combination of technological and policy changes occurring in the industrialized world and the internal dynamic of development as *per capita growth in output in the face of resource constraints* lies behind the problems being encountered in all three areas. The challenge now is to modify the dynamic forces of development to be sustainable in relation to available resources, including natural resources and environmental services, wealth and saving for investment, human capital, and social equity. Only if such a paradigm can be defined will debt problems be soluble. Absent this paradigm, even wiping out all debt will have little lasting effect.

In explaining the growth of debt, Shilling argued that the often cited explanation, the availability of cheap capital seeking a demand following the oil shock of 1973/74, is only part of the story. Other factors included the demand by developing countries to exercise greater control over their development, their desire to provide improving living standards to growing populations in the face of resource limitations, and greater volatility in international commodity and financial markets.

As to the first, many newly independent developing countries were attracted to development models that relied on the state and restricted direct foreign investment and participation within the domestic economy. However well intentioned, these models contributed to a range of economic distortions, inefficiencies, and corrupt practices. As to the second, raising the living

standards of a growing population takes capital and puts pressure on natural resources.³⁴ Consumption in the short-term reduced domestic savings levels. In turn, this increased demand for foreign savings (borrowing). As to greater volatility in international markets, the basis for this predates the oil shock of 1973/74.³⁵ Volatility complicated the issue of accumulating and allocating capital productively³⁶ and equitably for *all* countries. However, it impacted particularly upon developing countries whose experience in handling volatility and capacity to absorb adverse fluctuations were less than those of their industrial counterparts.

Shilling argued that for these reasons (and accepting that most individuals in positions of power are fallible mortals subject to temptation), the debt problem, degradation of the natural resource base, and growing inequities within developing countries all stem from the same fundamental causes far more than they stand in causal relation to each other. The drive for rapid growth, given external circumstances and the accepted development models, led to high levels of borrowing, pressure on the environment, and worsening income distributions.

Misallocation

Although this provides an explanation of the origins of indebtedness and how it stands in relation to other problems with which it is associated, Keyfitz argued that it helps understanding to go one step further; to question how it has been possible for developing countries to incur general non-performing debt on a scale impossible by the standards of conventional accounting. Shilling, also, considers this the critical question and distinguishes between two distinct problems; that represented by the need to repay the debt, and that of misallocation that permitted non-performing debt to accrue in the first place. Misallocation, he argued, is not a debt issue but a question of policy and governance. It needs to be addressed *independently* and *ahead* of the debt problem if there is to be effective use of capital in the future.

³⁴ In narrow economic terms, exploitation of environmental wealth offered substantial benefits in augmenting growth, at least in the short term. Resources seemed limitless to many decision makers, and the costs were not readily accounted in measurements of growth or development. Short-run increases in income can be obtained by depleting natural resources or through practices which eventually result in degradation of the resource to a non-productive level. Deforestation for fuel-wood and to permit more extensive agriculture, overgrazing, failure to control toxic pollution, excessive fertilizing, and soil depletion are but a few examples. Such practices can be found through history. However, the extent of exploitation before was small in relation to the global environment and planetary resources. This is no longer the case. Expanding populations are pressing on natural resources in many parts of the world just to maintain their current low living standards, and more growth may be difficult for them. This basic situation would be little different if there were no debt to service. The demands for growth and for higher living standards would remain and encourage exploitation of natural resources and wealth for quick returns. This happened before debt was a problem, happens in countries where debt is not a problem, and happens in countries where debt service is being ignored.

³⁵ The basis for this was in the industrialized countries' move to floating exchange and interest rates, freer trade regimes, and (somewhat later) liberalized capital accounts.

³⁶ Volatility of prices and financial instruments has the effect of transferring ownership of large amounts of existing wealth (or claims on wealth) quickly, within as well as among countries, on the basis of luck, speculation, or manipulation. These transfers have little to do with improving productivity or the basic productive processes. The short-term financial incentives and opportunities often lead to uneconomic longer term results.

Much of the capital borrowed by developing countries during the 1970s and early 1980s was not invested productively. Weaver cited several sources that have researched the use of borrowed money. Approximately 30% was devoted to paying for petroleum imports and a further 20% to purchases of military hardware. Money was also borrowed to finance prestige projects - nuclear power plants, large-scale dam projects, etc. - which had no hope of yielding an economic return.³⁷ Some countries, especially in Latin America, also borrowed to import foreign goods and prop-up the exchange rates of their over-valued currencies. Sagasti commented that as well as capital being used for non-productive purposes, there was misallocation even within the productive economy. This was not solely the fault of the developing countries. He cited investments made in copper mining and refining activities in South America which were encouraged by the Canadian financiers even though a return would have been possible only had the copper price risen to US \$1.25 a pound, which was wholly unrealistic.³⁸

The vehicle for non-productive investment was the Euro-credit. Shilling observed that this was an attractive instrument for creditors since it combined floating interest rates with foreign exchange denomination and debtor government guarantees. Borrowers did not understand the risks and appreciated the speed and lack-strings associated with these loans. Countries borrowed more than they could afford, and the banks readily lent. This borrowing often allowed countries to avoid rather than support hard policy decisions about economic adjustments. That banks paid little attention to the ultimate use of their funds only compounded the lack of conscience with which borrowers allocated, or misallocated, the borrowed funds. In the process, while wealth was transferred from savers in the industrial- and oil- rich to the developing countries it brought little increase in productive capacity or incomes in the borrowing countries.

Lack of confidence

Keyfitz also questioned whether the debt problem would exist if in every other respect developing countries matched their industrialized counterparts, except that their citizens lack confidence in their own countries and this lack of confidence causes chronic capital flight.³⁹ The whole process, Keyfitz asserts, is self-reinforcing. There are successful enterprises in developing countries: What then is the difference between these and their counterparts in Europe, Japan, or the US that has so negative an impact upon investors' willingness to risk capital?

³⁷ Some US \$440 billion was used by Brazil to finance nuclear projects, none of which are productive. The Philippines currently is due to pay US \$500,000 per day in interest payments on loans taken out to build a nuclear plant, also non-functioning. Both sets of figures are from, S. George, *The Third World Debt Crisis*, in Smoker, P., Davies, R., and Munske, B. (eds.), *A Reader in Peace Studies*, Pergamon, 1990.

³⁸ The current price of copper is ca. US \$0.65 per pound.

³⁹ This issue is treated in *World Imbalances*, a World Institute for Development Economics Research (WIDER) report from the Committee chaired by R. Dornbusch, WIDER, 1989. As the WIDER group puts it (p. 73), "The principal component of a successful debt strategy must therefore be to bring about a reversal of capital flight."

Part of the problem lies in the ways that claims upon the receipts of a successful enterprise are allocated. At one level of explanation there are many "reasons" why the claims of creditors (especially foreign creditors) upon a profitable enterprise are given low priority and many "devices" for ensuring others' claims are exaggerated and met first. Conventional accounting standards would normally reject these "reasons" and "devices". The problem is that such standards are not applied. In critical functions, such as accountancy and government service, many developing countries have failed to achieve the necessary separation between personal interest and professional responsibility.

This failure to disembed the economy from society⁴⁰ - to free developing societies of corrupt practice - is a double burden. Without professionalism in accounting, company accounts cannot impartially protect the several interests represented by capital, labor, management, suppliers, and consumers. Neither do they correctly tell where the firm stands. Its second order impact is to reduce confidence, most critically that of developing country citizens in their own economies.

Individual citizens of developing countries are reputed to have sufficient credits in foreign banks to pay off all their countries' debts.⁴¹ Corruption and inflation - the latter a short-term solution commonly used by developing country governments to enable them to meet wage claims - combine to sap investor confidence in their own economies. Capital flight ensures that the currency devaluations feared by investors actually occur. Whether funds are gained legally or illegally, if investors had confidence in their countries and general openness they would invest at home. Instead, their insistence on investing funds abroad creates a balance of payments problem and it is this above all that prevents the repayment of foreign lenders. It is not profits that are lacking, but the capacity to convert them to international currency.⁴²

⁴⁰ Karl Polanyi (1886-1964) saw such a disembedding process in the rise of Great Britain as an industrial power. The relation of the economy to the society is always somewhat uncertain, but the ideal in an industrial society is absolute separation of the economy from other elements; for the economy to function efficiently needs total impartiality in critical judicial functions (the work of judges, accountants, and many administrators). See Karl Polanyi, The Great Transformation, New York: Rinehart, 1944 also Primitive, Archaic, and Modern Economies: Essays of Karl Polanyi, G. Dalton (Ed.), Boston: Beacon Press, 1971.

⁴¹ George estimates Mexican capital flight to be in excess of US \$100 billion (George, S., *The Third World Debt Crisis*, *ibid*, 1990). Estimates have been made for Argentina by Perasso (Perasso, G., *Capital flight and foreign debt accumulation: a note on Argentina*, in Third World Debt: How Sustainable are Current Strategies and Solutions, H. O'Neill (ed.), Cass, 1990).

⁴² Sagasti noted that indebtedness does not cause capital flight, although it can contribute to a downward spiral in which monies loaned are expropriated and deposited abroad. Capital flight is due to structural problems and to lack of confidence. Several heavily-indebted countries have no severe capital flight problem; examples are Colombia, Peru, and Chile. At the other extreme are several countries whose severe capital flight problems pre-date the debt problem; these include Argentina, Mexico, and Venezuela.

Capital shortage

Sagasti took up these issues of misallocation and confidence and set them within the context of capital shortage. Whereas in the 1970s and early 1980s, capital was abundant, at present and for the foreseeable future the world faces a real capital shortage.⁴³ This, above all else, makes policy change in developing countries imperative if they are to compete effectively for capital from outside, win the confidence of domestic savers, and secure the return of flight capital. Policy changes and improvements in investment allocation procedures will be needed to secure capital since investors will need to be assured that capital will be used effectively rather than placed in misjudged projects, devoted to arms, or lost through appropriation.

The theme of capital shortage was taken up by Keyfitz as a key element of the problematique. In spite of prosperity, the industrial countries are spending unprecedented fractions of income on consumption. Japan and Germany, which have been the chief suppliers of investment funds, now have less to transfer. Following re-unification, Germany itself needs capital to effect the reform and integration of the former East German economy. This shortage of funds comes at exactly the time when competition for available investment is intensifying, partly because the former East-bloc countries have come into capital markets and have back-logs of obsolescent industrial and social equity to replace, and partly because more developing countries are opening to outside investors.

Unless there is an unanticipated pick-up in private or government saving, developing countries will be faced more and more by the need to accumulate their own capital. Thus, behind all the discussion of investment and aid to developing countries is the clear choice: if development is to progress and the industrial countries do not do the saving that will finance it, developing countries will have to finance it themselves. Saving is not impossible for poor countries; India, for example, saves around 15% of its national product. But this will require abstention, reform within developing countries to give domestic savers confidence to invest, and hard decisions over how the necessary sacrifices are to be distributed.

This bad news comes at exactly the time when the developing countries have become convinced that private enterprise and foreign investment is what they must turn to for development. This has been the industrial-countries' message to developing countries for over a generation. Now that many have accepted the argument, there is little finance available and many candidates for what money there is. For Keyfitz, this presents a double danger. One is that developing countries forced to build-up their own capital may resort to autarchy and central direction of their economies. This would be perverse in that central direction, only so recently abandoned, is to be avoided in bad times even more than in good. The other is that, with many candidates for investment funds, only projects on which the return is very high will be considered. High return projects are not usually the infrastructure and factories that are central to development over the long term, or the social projects (education, health care, family-planning services, etc.) that would raise real living standards and help bring about fertility decline, or the investments needed in environmental restoration.

⁴³ Sagasti cited a recent report from Salomon Bros., the brokers, who forecast a capital shortage for at least the next 10 to 15 years.

Current policies and approaches

With a tightly constrained financial outlook and growing concern for the environmental and human impacts of development, two questions stand out for developing countries: From where is finance to come to replace and expand the existing capital stock? With what technology is outdated equity to be replaced and expanded? It is against these questions that current institutions and policies toward indebtedness, new financial flows, and the disbursement of capital must be reviewed.

As to the first question, Tropp considered among the principal negative effects of indebtedness to be its diversion of intellectual and financial resources.⁴⁴ Instead of "creating the future", resources are spent "digging out from the past." This is doubly bad. In the first instance, there are constraints on what indebted nations can be offered in terms of forced workouts and restructurings,⁴⁵ along with limits on what is in their own interests to accept.⁴⁶ In the longer term, it frustrates the development that would see the problem resolved.

Taking up this last point, Ayres saw the need to build developing country' economies as the pre-requisite to resolving the debt problem. With development, they will increase their capacities for repaying and servicing loans. The problem is that, once established, the indebtedness syndrome is self-reinforcing.⁴⁷ Breaking the downward spiral will take new capital. From where can this come? Given past experience, further loans from commercial banks (to finance public investment) are unlikely. Only limited amounts will be available from multilateral or bilateral sources. This leaves only two other sources; direct foreign investment, and domestic saving/investment.

Against this backdrop, Ayres cautioned against forced debt write-off. This would lead to a major deterioration in the capital position of the commercial banks, especially the dollar-denominated banks. Since the US dollar is the world's reserve currency as well as the currency in which most debt is denominated, forcible write-offs would further raise the relative values of the Deutsche Mark and Yen and make already-scarce capital, scarcer and

⁴⁴ Finance excellence, Tropp argued, is a resource scarcer than money in most developing countries.

⁴⁵ Owing to tough judicial fiduciary standards, creditor directors are substantially constrained in how generous they may be in offering workout terms and are at personal financial risk if they err on the side of being too generous.

⁴⁶ Debt relief through forced workout on terms better than the norm is not in the interest of debtor nations if they aspire to have the creditor community help build their future.

⁴⁷ The economic crisis begins a perpetuating downward spiral which gives rise to the phenomenon of "unlimited" indebtedness. Needing hard currency to service debts, debtor countries are advised to restructure their economies toward exports. But low labor cost, which in earlier times would have provided a competitive advantage and a start on the value-added ladder, is no longer a significant advantage. Typically, labor now adds less than 20% to the production cost of most goods. Debtor countries are forced into exporting raw materials, which gluts world markets and further depresses commodity prices. With export earnings insufficient to service debt, both the economic crisis and levels of indebtedness deepen.

more expensive. The scope in debt-equity conversions is also limited since there is little real equity involved. It was the very fact that borrowed money was used unproductively that led to debt build-up in the first place. And however laudable the concept, there is only restricted potential in debt-nature swaps. At best, these can only be a marginal adjunct to general debt relief efforts.⁴⁸

As to the second question, on the choice of technologies with which to replace and expand the existing stock of equity, Sagasti noted major deficiencies in local capacity to make appropriate technological choices. As to public investment, the need is for a combination of new approaches and methodologies for scrutinizing those investments that use large amounts of capital, commit capital and other resource use long into the future, or have high opportunity costs. These investments must be made with environmentally-sound technologies. The same is true for private investments large enough to warrant public scrutiny.

As for the myriad smaller investment decisions, there is need for a policy environment that ensures decision makers build the full costs of alternatives into their analyses. In turn, the capacity to make such analyses - which depends upon blending appropriate methods, sound information, and analytical skills - needs to be built-up.

To what extent could greater scrutiny of projects secure more effective use of capital? Sagasti commented on a recent study of nine projects, all Peruvian; five funded by private banks using lack-string instruments on commercial terms, and four funded by multilateral lenders on concessionary terms. The privately funded projects had mostly turned sour (the previously cited copper mining and refining project was among these), whereas those funded by the multilaterals had performed well. In part, this reflects that the private lenders, having secured government guarantees, were more concerned to make loans than to ensure that monies loaned were put to effective use. In contrast, the multilateral funders had insisted upon proper procedures for project evaluation, procurement, and accounting.

Toward new capital flows

Addressing the nexus of debt and new capital issues from the perspective of investor' motivations, Tropp argued that factors which have led to misallocation and lack of confidence will have to be tackled for debtor countries to attract new equity investment from external or indigenous sources. Rather than crafting an intellectually comprehensive policy approach to the indebtedness problem, the priority should be to identify and remove the principle constraints to the flow of new investment. These include a prevailing policy frame that limits foreign investors' rights (for example, to collateralize and alienate investments or to freely remit dividends and repatriate capital), the absence of generally accepted accounting practices

⁴⁸ Sagasti was also cautious over the potential of the currently popular "debt-for-nature" agreements. Although such agreements make important individual contributions, and the relevant programs should be expanded, they cannot be used to secure general environmental objectives. Swaps take substantial time and effort to execute properly, and they require net resources (wealth) to be transferred from outside the debtor-creditor nexus. While more work should be devoted to these, they are, at best, adjunct activities and will have only marginal impacts on either debt overhang or the environment. It must also be considered whether this is the most efficient use of resources.

(GAAP) or GAAP-comparable standards,⁴⁹ and lack of expertise in preparing acceptable business plans.⁵⁰

The major constraint to a removal of policy impediments to investment is the political risk this implies for developing country governments. The political key to getting the critical impediments removed, then, is to keep the short-list of policy reforms sufficiently short⁵¹ to be perceived as "do-able". The urgent task of the donor community is to help debtor-country politicians to understand these reforms as a potential internal constituency-building asset⁵² rather than a possibly fatal political liability, and then help build the constituency for reforms.⁵³ Reforms should be supported by financial mechanisms designed to attract hidden capital, held unproductively at home or abroad.

Hidden capital exists and is available to be prudently harnessed as an instrument of development policy and debt reduction. Tropp cited two recent illustrations. Pakistan's Mahbub al-Haq devised two different bonds to attract unregistered domestic and flight capital and found, to the great surprise of his government, that billions of underground dollars surfaced from Pakistani private holdings both within and without the country. The privatization of the National Commercial Bank of Jamaica, several times oversubscribed by comparison with its underwriters' expectation, provides another illustration that a believable domestic investment vehicle can bring capital "out of the mattresses" at many times the level governments had expected. Privatizations elsewhere could be equally effective, and the resultant collection of hard currency would make a significant immediate inroad into any countries' debt levels.

⁴⁹ Absent accounting standards, it can cost an investor \$100,000-\$200,000 up front, before he even learns whether an investment will turn out to be practicable, to commission the accounting and the auditing required to meet investor "due diligence" standards. A potential opportunity's return must appear unusually certain, and quite large, in order to warrant that expense at the inception. Few meet that test.

⁵⁰ Tropp argues that few developing country entrepreneurs have experience in preparing business plans acceptable to the investment community. This, by itself, *not their debtor status*, may be the major impediment to a non-trivial flow of new equity capital into debtor countries.

⁵¹ Implementing GAAP-accounting standards should be part of the reform agenda.

⁵² As policy impediments to investment are removed, the problem of capital flight will begin to solve itself. In repatriating capital, domestic holders of funds will help risk-taking political leaders by establishing a domestic constituency for the reforms. Those indigenous investors who repatriate funds into domestic investments will become the most vociferous supporters of reforming politicians, simply to protect their own investments.

⁵³ The threshold constraint is that these potentially capital-repatriating investors are not a constituency at the point that reforms need to be enacted. Politicians do not see them present at the time that political risks must be taken, and it is difficult for leaders (caught between the IMF and the Paris Club on one side, and domestic reform-resisting constituencies on the other) to visualize a supportive constituency which does not yet politically exist. It is this visualization process with which the donors must help and encourage.

On the business-planning question, Tropp argued that nothing will so attract an investor to commit equity capital as the presentation of well thought-through business plans in a familiar, digestible form. Yet few investment-promotion agencies within developing countries now concentrate on this task, or know how to do it. The donors as a collection, and each developing country for itself, need to organize themselves to channel and screen entrepreneurs' business ideas, and to help those with promising ideas turn them into finished business plans *before* any approach to outside investors is made.

At present there is no multilateral agency with responsibility for helping link entrepreneurship, venture capital, and ecologically-sound technologies or for building countries' capacities to undertake this linking themselves. Both Sagasti and Tropp considered this a significant and readily-correctable deficiency. Tropp noted that IFC's African Project Development Facility (APDF), which is designed to address this problem directly at regional scale, may be, at relatively low cost, the single most effective donor assistance to Africa.

Debt for reform?

But to what extent should policy reforms, privatizations, the implementation of accounting standards, and the provision of environmental safeguards be preconditions for debt relief or the disbursement of new IFI capital? Tropp, Shilling, and Ayres considered such leverage legitimate and desirable. Shilling cited a number of cases (e.g., Turkey, Mexico, and Indonesia) where conditions associated with debt reduction have resulted in major and sustained policy reforms and led to higher rates of economic growth. Nonetheless, he argued, serious issues of environmental sustainability remain.⁵⁴ Conditionality should be part of the strategy, but the recommended policy packages should be reinforced with measures to better safeguard the environment and secure equity objectives.

Sagasti was less convinced on the conditionality issue. There are similar dangers in prescribing reform as in any other form of prescription; for every generally positive reform, there are specific negative counter examples. Also, when reforms are undertaken at outsiders' insistence, this divorces domestic politicians from responsibility to support policies that are not "theirs". Reforms have greater chance of being carried through and supported when introduced at governments' own instigation. For these reasons, persuasion is a better approach than coercion. Rainbow too, was concerned for reform to be internalized and not imposed. The discussion, he suggested, raises wider issues of sovereignty: whether it is legitimate to interfere in the affairs of sovereign nations⁵⁵ and, how challenges to sovereignty might be mounted without a seemingly coercive, "big-stick" approach.

⁵⁴ The same is true in cases where countries have followed IFI adjustment programs. Despite gains in efficiency and growth potential that follow from the more market-oriented strategies these programs promote, they are by no means perfect. Increased participation in international trade with liberal trading regimes generally contributes to greater efficiency and larger incomes. Abuses of environment to increase trade are a result of faulty industrial policy and planning, and they need to be addressed on those terms. Even without debt service payments, the same monetary incentives that lead to abusive practices would persist as long as demand exists abroad.

⁵⁵ For example, where basic human rights and needs are neglected by governments (elected or otherwise) of sovereign states.

On policy reform, Kebede also noted that sequencing is very important. Real reform has to come from within. This implies that it may be more effective to emphasize and promote basic political rights and so empower grass-root movements within developing countries, than attempt directly to impose specific kinds of economic reform or environmental protection from without. Suitably empowered, people will be better able to press for the policies and protections appropriate to their own needs and local conditions. This is particularly true in the African context, Kebede argued. Market reform may not be the real priority. For markets to work efficiently, physical infrastructures need already to be in place. Africa is still absent basic infrastructures and this means that African governments still have a major economic role to play. Market reform will be needed to provide for efficiency; but political reform is needed first.

Toward putative solutions

Against these reservations, Sagasti saw a different possibility in debt relief. Whether or not indebtedness actually forces development along environmentally-damaging pathways, it is often perceived that this is the case and many developing countries make this claim. Under such circumstances, Sagasti argued, debt becomes an issue for negotiations in which relief could be voluntarily traded against policies and investments that protect the environment and reduce adverse impacts of development.

How might such a solution be implemented? Brown-Weiss saw parallels in the Enterprise-for-the-Americas initiative. This makes funds available for debt reduction, subject to agreement among commercial and concessionary funders. The debtor government must continue paying interest at pre-existing levels, but in local currency and into a fund held within the debtor country. These funds are disbursed by a locally-established committee made up largely of NGOs, and are used for projects that provide environmental protection.

A major gap exists between present financial institutions and the kinds of project they are willing to finance on the one hand and, on the other, the institutions and kinds of finance needed for environmentally- and socially compatible development. The model of the Enterprise-for-the-Americas initiative may exist, but has so far not diffused sufficiently to fill this "gap". The need is for venture capital for projects that have no tangible, appropriable return in a strictly economic sense; projects to build local capacities linked to the environment, for energy-saving, or for reducing population growth rates. The ingenuity and challenge, Sagasti argued, will be in creating the necessary institutions in practical and pragmatic ways.

The starting point for this is that, whatever policies are drawn up on debt relief these should be designed against the backdrop of capital shortage. The intent should be to help create conditions that will attract investment and ensure that capital will be used efficiently, effectively, and in ways that are least damaging to the environment. The key point to emphasize is that improvement in environmentally-sound technology can only come through new investment.