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International Biodiversity Policy Program

THE GEF AND BIODIVERSITY CONSERVATION:

LESSONS TO DATE AND RECOMMENDATIONS FOR FUTURE ACTION

Russell A. Mittermeier and Ian A. Bowles

Conservation International Policy Papers I
May 1993

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CI's International Biodiversity Policy Program seeks to apply the lessons learned from CI field programs to the broader policy discussion about issues such as the implementation of the Convention on Biological Diversity and the restructuring of the GEF.

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I. Introduction

Our planet faces an array of environmental problems, from air and water pollution, hazardous waste disposal, and soil erosion to global climate change and ozone layer depletion, coupled with explosive human population growth in the tropics and excessive resource consumption in developed countries. However, we believe that there is one issue that surpasses all others in terms of long term global impact and that is loss of our planet's biological diversity.

Although biodiversity is a relatively new term that only began to achieve public prominence as a result of the Earth Summit in Rio de Janeiro in June 1992, this issue is really the most fundamental of all environmental concerns. Biological diversity, most simply stated, is life on Earth, the wealth of species, ecosystems and ecological processes that make up our living planet. It is our living natural resource base, our biological capital in the global bank, and without it we quite simply could not ourselves persist as a species.

One of the key features of biodiversity is that its loss is an irreversible process. We can develop technological fixes for most other environmental ills, but often lack only the political will or the economic incentive to use them. In contrast, once a species of plant or animal goes extinct, it is gone forever and will never be seen again. We now face a series of potential, and possibly already ongoing, extinction spasms unlike anything since the disappearance of the dinosaurs 65 million years ago (see *e.g.* Myers, 1979, 1983, 1984, Wilson, 1988, 1992). Indeed, we are at risk of losing not just single species or communities of different species, but entire ecosystems. Ironically, we face this risk at a time when we are just starting to harness the immense power of biodiversity.

Over the last five years, we have seen increasing international attention paid to biodiversity. This culminated at the Earth Summit last June with the completion of Agenda 21 and a major international Convention on Biological Diversity, a document signed by some 165 nations. Concurrent with the Convention negotiations was the development of a global fund for biodiversity conservation and other environmental priorities, the Global Environment Facility (GEF).

The GEF's roots go back to the 1987 report of the World Commission on Environment and Development, or Brundtland Commission, named after its chair, Prime Minister Gro Harlem Brundtland of Norway. The Brundtland Commission concluded that there was "a serious lack of funding for conservation projects and strategies that improve the resource base for development" and suggested that "serious consideration should be given to the development of a special banking program, or facility" to fund conservation projects. Following the Commission's recommendations, the United Nations Development Programme (UNDP) commissioned the World Resources Institute (WRI) to undertake a year long study to develop recommendations for new directions in international conservation financing.

Chief among the new proposals of the 1989 WRI report, *Natural Endowments:*

Financing Resource Conservation for Development, was the concept of creating International Environmental Facilities to identify and support promising conservation projects. The study envisioned a series of such facilities to play a brokering role between governments, bilateral aid agencies, the multilateral development banks (MDBs), intergovernmental organizations and non-governmental organization (NGO) project implementers. In September 1989, the French and German governments proposed the creation of a global "facility" for this purpose.

The GEF was subsequently created in November 1990 as a collaborative venture of two main Implementing Agencies, the World Bank and UNDP, with the United Nations Environment Programme (UNEP) serving as the secretariat for the GEFs Scientific and Technical Advisory Panel (STAP). The GEF is chaired by Mohamed El-Ashry, Director of the World Bank's Environment Department, where the GEF's Administration is also housed.

From the outset, biodiversity conservation was one of the four principal activities the GEF was to address, the others being global climate change, protection of international waterways and reduction of ozone-depleting chemicals. The initial funding level for the GEF was put at Special Drawing Rights 1 billion (U.S. $1.3 billion) and to date the GEF core fund has some $860 million in commitments. Although only approximately 40% of that is to be spent on biodiversity, it is a sum far beyond the most optimistic imaginings of those of us who have worked in biodiversity conservation for the past few decades.

Figure 1. Rapids of the Raleighvallen-Voltzberg Nature Reserve, Coppename River, central Suriname. This area is part of one of the world's three largest Major Tropical Wilderness Areas. (photo: J.P. Schulz)

The GEF was originally intended to fill an unoccupied niche and facilitate support for initiatives that other donors were not supporting. With the Earth Summit in Rio, prominence of the GEF grew still more and it was designated the interim funding mechanism for the Biodiversity Convention, a move that introduced a new level of political complexity to the GEF. Nevertheless, the biodiversity portion of the GEF is the largest commitment ever made to this issue by the international community, and it has generated immense expectations and optimism (tempered with considerable doubt and caution, given the environmental track record of its Implementing Agencies).

Now, two and a half years after the creation of the GEF, two years after the approval of the First Tranche of projects (May 1991) and near the end of its Pilot Phase, it is critical to assess the effectiveness of the GEF's biodiversity component. The purpose of this paper is to do just that. We believe that the GEF still has immense potential to effect change and to turn the tide on this critically important issue, but we also believe that major reforms are needed in the GEF if it is to have real impact on global biodiversity. We begin with a discussion of the scope, value and use of biodiversity, follow with the issue of priority setting, and finish with a section on recommendations for specific changes in the way the GEF deals with this key issue.

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II. Scope, Value and Use of Biodiversity

After decades of obscurity, or being equated first with endangered species protection and then tropical rain forest conservation (which are only a small part of the picture), the importance of biodiversity conservation has slowly begun to emerge from the shadows, largely due to the pioneering efforts of individuals such Norman Myers, E.O. Wilson, Peter Raven, Thomas Lovejoy, Kenton Miller, Jeff McNeely and a handful of others. Biodiversity finally began to take on international prominence at the Earth Summit, in part because it was the subject of one of the two major conventions (the Convention on Biological Diversity) discussed at this event, but mainly because of the failure of the United States to sign the Convention. The Bush Administration's stance generated tremendous press coverage and forced many other high level government officials and heads of state to look at biodiversity for the first time. Although the American environmental NGO community opposed the Bush Administration position, the net result, ironically, has been very positive for biodiversity.

Human beings can put millions of bits of information on tiny computer chips, yet we do not know, probably to within two orders of magnitude, how many other forms of life share our planet.

However, the increasing attention this issue has received has also served to underline how little is still known of the scope and the value of biodiversity on Earth. Our lack of knowledge falls into two major categories: ignorance of the total number of other living species (see *Fig. 2)* and ignorance of the true value and extent of current and potential future use of biodiversity.

A. Scope of Biodiversity

Our measure of biodiversity is embryonic at best. Science has thus far described only about 1.4 million species of living creatures, be they animals, plants, or microorganisms. However, estimates and projections made in the last few years indicate that total species diversity on Earth could be as much as 10 million, 30 million or perhaps even 100 million or more species. Needless to say, our ignorance of the ecological processes involving this multitude of organisms is even more profound. Human beings can send members of their own species to the moon and other spacecraft to the farthest reaches of the solar system, and can put millions of bits of rapidly retrievable information on tiny computer chips, yet we do not know, probably to within two orders of magnitude, how many other forms of life share our planet with us.

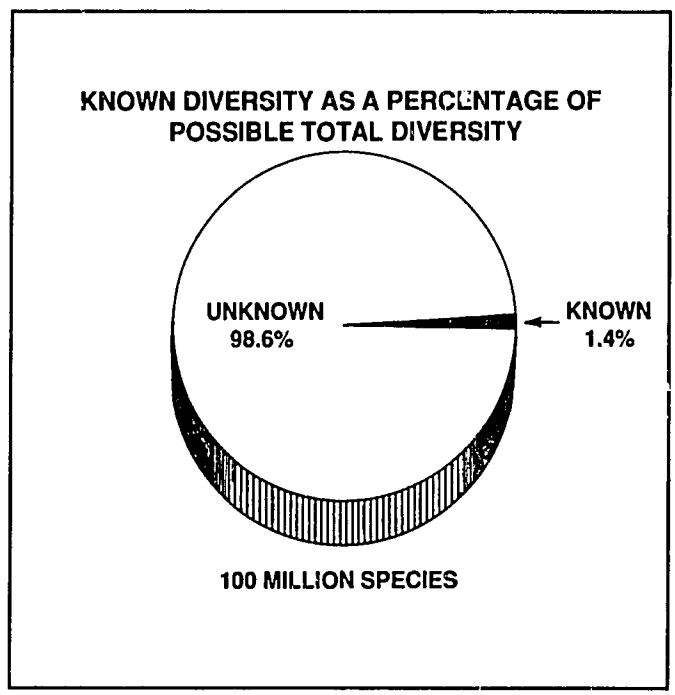

Figure 2. This pie chart shows the extent of mankind's knowledge of the possible total species diversity on Earth.

B. Value of Biodiversity

The other glaring gap in our knowledge involves the valuation of biodiversity. Placing value on the services provided by Earth's many ecosystems and species is difficult and in its infancy as a quantitative discipline. In most cases, discussion of biodiversity value revolves around either its future potential for biotechnology innovations and new pharmaceuticals (*e.g.*, "cures for cancer and AIDS from the tropical rain forest"), or a handful of products from tropical countries that are currently in international trade (*e.g.*, timber, rubber, and Brazil nuts from the Amazon, rattan from southeast Asia, etc.). How-

Figure 3. Logging truck near Tai National Park, Cote d'Ivoire. Unsustainable use of timber resources is one of the principal threats to biodiversity in this hotspot area. (photo: I.A. Bowles)

ever, the real value of biodiversity based on actual current use is far more extensive. For convenience, a shorthand that we use recognizes six distinct categories of biodiversity use, as follows:

1. Global Intangibles. For simplicity we have divided this category into two related items: ecological values and geopolitical values.

Ecological values. Biodiversity is not a static entity but a dynamic system of evolutionary innovation, and complex, functioning ecosystems that buffer the world against shifts in climate and crop yield. Some of these global values, such as carbon sequestration and watershed protection belong in category 2 below and can be quantified; others, like the impact of healthy ecosystems on issues like climate change and ozone layer depletion, are much more difficult to assess.

Geopolitical values. Biodiversity has great importance in maintaining global geopolitical stability, a term sometimes referred to as "ecosecurity". Developing countries depend on biodiversity on an even more immediate basis than do the developed nations. Environmental degradation in the poorer countries is not buffered by sophisticated high-tech approaches to life that distances people (at least temporarily) from their dependence on biological resources; its negative impacts are confronted on a daily basis in the form of shortages of fuelwood, food, fiber and other diverse ecosystem products. The increasing environmental degradation in these countries, exacerbated by growing populations, economic crises and social unrest creates a series of vicious cycles that become difficult to break.

If not dealt with in the near term, these small, degradation-based crises will coalesce into national and regional conflicts. A healthy environment needs to be provided for people everywhere, and it ultimately comes down to restoring, maintaining and appropriately using the biological resources that each nation, region and community requires for its survival.

In the Western Hemisphere, Haiti and El Salvador are examples of densely populated countries with badly degraded environments that have already entered into such a vicious cycle of political and economic instability. Breaking the cycle will not be easy, with or without democracy, which has a tenuous hold at best in nations with such a range of problems. The lack of options at home has driven a good portion of the populace of these two countries to seek refuge elsewhere, generating another series of geopolitical stresses. Whatever political solutions may be devised, countries like these will not be viable over the long term without major restoration of their natural resource base.

2. Major Ecosystem Functions. Certain ecosystem functions such as watershed protection for urban and agricultural areas around the world,

for carbon sequestration and for water purification (*e.g.*, wetlands) can be quantified through existing methodologies. However, this is only now starting to be taken into consideration when looking at the value of a given ecosystem and trying to decide its future, and is rarely incorporated into national income accounting procedures. Nonetheless, this value is so great that it by itself justifies protection of a given ecosystem.

3. *International Export Values.* This is the biodiversity value that is most often cited and quantified, and is probably the easiest to assess. It includes, as a major product, timber from forest ecosystems, other well-known non-timber products like rubber, Brazil nuts, and rattan, animal products like fish, meat and skins, and a variety of other outputs that regularly cross international borders.

Certain ecosystems functions can be quantified... However, this is only now starting to be taken into consideration.. ..and is rarely incorporated into national income accounting procedures.

With pioneering efforts like the Merck, Sharp & Dohme Pharmaceutical Company-InBio arrangement in Costa Rica, the range of internationally exportable ecosystem products is likely to expand rapidly. However, in our opinion, this use of biodiversity is still in the "tip of the iceberg" category. The bulk of global use and value of biodiversity is likely to fall into the last three categories.

4. *Regional Market Values.* The vast majority of uses of biodiversity, and hence its value, relate to what actually happens within the borders of a particular nation, rather than internationally. Everyone depends on biodiversity in its endless manifestations, and the immediacy of this dependence is even more obvious in the developing countries of the tropics than in the industrialized world. For convenience, and because they are qualitatively different, we divide these intranational uses of biodiversity into three categories: regional market, local market and household use values.

Regional market values refer to products that enter into the regional economy and may change hands several times before they are finally consumed, increasing in value as they go along. An excellent example would be food products in the market of Manaus, the major hub city in the central Brazilian Amazon. Market products in this city of more than 1 million come from hundreds of kilometers in every direction, and these regionally used products far exceed in value any emanating from international export products in this same part of Amazonia.

Figure 4. A Malagasy pharmacy. Indigenous knowledge of medicinal plants may be critical for new pharmaceuticals and biodiversity conservation alike. (photo: R.A. Mittermeier)

5. *Local Market Values.* This category is similar to regional market values, except that the products are exchanged or sold in a much more circumscribed area than those in category 4. Furthermore, though there is undoubtedly some overlap between local and regional products, we suspect that many locally used products will differ from those that reach regional markets. Some may be of high value and locally prized, others may be highly perishable, still others may be of low value and therefore not justify transportation costs to regional markets.

Although products of this kind do change hands, we suspect that they will only do so once or twice. An example of such products would be those sold in a small Amazonian town or village market upriver or downriver from a hub city like

Manaus. At this point, we are unable to compare local and regional market values in scale, but believe that local may in fact exceed regional in importance and overall economic contribution.

6. Household Use Values. At the bottom of the pyramid, we have household use of products provided by a given ecosystem. In this case, the product does not change hands, but is rather used by the individual (his/her family or immediate circle) who collects or produces it. An example would be game meat eaten by a hunter and his family, thatch for a house, or a piece of bark used to brew a tea for headaches. Although such products do not have an actual cash value, they do have what could be called "replacement value".

If a forest ecosystem on which a given community depends is clearcut for cattle pasture, that community must either import foreign or regionally made products to replace those that were lost, or life in the area becomes unsustainable. If the latter occurs then the community is forced to move, often to the slums of an urban center where they add to the social and economic burden of the nation in question.

This issue of household use is often overlooked, even in studies like those on "extractive reserves" in Amazonia. Rubber-gatherers and Brazil nut collectors don't live exclusively from sales of these two products, but from a wide range of goods and services that the forest provides. However, it is usually only the Brazil nuts and the rubber that undergo economic analyses because they generate foreign exchange. We believe that the few economic analyses of biodiversity thus far conducted have focused too much on the foreign exchange element, and little or nothing on the full scope of ecosystem use and value. This needs to change quickly, and Conservation International has already undertaken several studies to address this issue.

C. Uses of Biodiversity

The range of uses of biodiversity is well documented in a number of publications, among them *The Global Biodiversity Strategy* (WRI/IUCN/UNEP, 1992), *Global Biodiversity* (WCMC, 1992), and *Conserving the Worlds Biodiversity* (McNeely *et al.*, 1990), and will not be covered in detail here. For the purposes of this paper, we divide these uses into four main categories, all of which overlap with one another to some extent. These are: agriculture, human health, industry, and recreation.

1. Agriculture: Agriculture accounts for more than 30 percent of the gross domestic product of low income developing countries. The value of agricultural trade is in excess of $3 trillion annually. Much of our civilization rests on the utilization of seven grasses: rice, wheat, barley, oats, sorghum, millet and corn. These require continued genetic input from cultivars and wild relatives to maintain their resistance to pests and diseases. Diversity of the wild relatives of these seven grasses must be maintained to keep these critically important elements of global biodiversity productive over the long term.

Another good example is that of coffee. Coffee is the number two commodity globally and a major export for many Latin American and West African nations. It is also susceptible to diseases like fungal rusts. To maintain the viability of coffee crops, it is essential to conserve wild relatives in the centers of origin of coffee in places like Ethiopia, the highlands of East Africa, and also, surprisingly, in the eastern rain forests of Madagascar, which have more than 50 wild species of coffee, several of which are naturally caffeine free.

Taking into consideration the geopolitical argument mentioned in Section II.B., it may be that the future of some emergent democracies of Latin America and West Africa, whose economies have a strong dependence on coffee exports, may have a very strong vested interest in the future of Madagascars rain forests. What is true of these major crop species is also true of the hundreds of other plant and animal species upon which we depend for our daily sustenance. The global interconnectedness of this dependence is not always obvious, but it is fundamentally important nonetheless.

2. Human Health. The relationship between maintenance of global biodiversity and human health is equally critical and obviously related to the preceding section as well. Biodiversity is a source of many of our current medicines (*e.g.*, 25% of all pharmaceutical prescriptions in the U.S. contain active ingredients

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Figure 5. Mayan temple ruins in the tropical forest, Tikal, Guatemala. Worldwide, ecotourism now generates some $12 billion annually. (photo: I.A. Bowles)

from plants and 3,000 antibiotics such as penicillin are derived from microorganisms, (WRI/IUCN/UNEP, 1992)), and as discussed below, this is sure to increase dramatically in the future.

In addition, biodiversity already provides the base for primary health care for about 80% of people in developing countries, some three billion people in all, through traditional medicine. This is a huge biodiversity use worldwide (at regional, local and household levels) that is rarely sufficiently appreciated by experts in the industrial nations. Furthermore, new diseases like AIDS emerge periodically, old enemies that we thought we had conquered (*e.g.*, cholera, tuberculosis, malaria and even bubonic plague) have seen a resurgence recently, and new biodiversity dependent technologies will be required to deal with them and a wide range of other health issues.

Worldwide, nature tourism generates some $12 billion annually.

3. Industry. Again, related to categories 1. and 2., biodiversity forms the basis for many of the world's industries, and will become increasingly important in the future. The 20 best selling drugs in the U.S. were all derived from compounds which included extracts from plants, animals or microorganisms, and with the rapid growth of the biotechnology industry this will be even more the case in the future. Biotechnology at very least will become the new Silicon Valley, and more than likely, it will usher in a new age, comparable to the Space Age in it tremendous impact. However, to realize its full potential, the biotechnology industry must do everything possible to help maintain its full range of options, the vast raw material that global biodiversity represents.

4. Recreation. Biodiversity also has an enormous recreational use, and connected with this is the maintenance of spiritual and psychological well being for our species. None of us want to see the entire planet become a barren urban ecosystem shared mainly with rats, cockroaches, flies, sparrows, and pigeons. Many studies have shown the damaging effects on the human psyche from long term isolation from nature in urban environments. Increasingly, people are looking to the natural world as an escape and as a means of maintaining their sanity, especially in the industrialized nations. And all of this translates into good economics as well, as the growing industry of ecotourism and other nature-based forms of recreation (*e.g.*, fishing, hunting, hiking) becoming ever more popular. Worldwide, nature tourism generates some $12 billion annually (Lindberg, 1991) and it is likely to grow even more rapidly in the tropical countries, where it is already a major foreign exchange earner for several countries.

III. Setting Priorities

The biological resources of every nation are critically important to its survival and worthy of conservation by every means possible. Nonetheless, some geographical areas contain far greater amounts of the world's biodiversity. Conservation International has devoted significant resources to priority setting for biodiversity conservation. In this section, we discuss several methods of global priority setting that we have employed, as well as approaches to regional, national, local and species-based priority setting, all of which have relevance to further biodiversity conservation activities undertaken by the GEF.

A. Global Priority Setting

Biodiversity is by no means evenly distributed over the planet. Certain areas are far richer than others in overall diversity and in endemism (species that are found only in a particular place, and nowhere else), and some are under severe threat. The potential large-scale loss of biodiversity that we currently face forces upon us a time frame that requires very rapid, decisive action.

The tropical rain forest, richest of the terrestrial biomes, provides us with a clear example. Recent estimates indicate that "as much as one half of the original humid tropical forest has disappeared and about one-quarter of the remainder is degraded" (Johnson and Cabarle, 1993), with some nations and regions (*e.g.*, Madagascar, the Philippines, the Atlantic forest region of eastern Brazil) already having lost 80-95+% of original forest cover. In areas like these, we have at best the remaining years of the decade in which to put in place appropriate conservation measures.

The example of the temperate rain forests of the world is similar or even more extreme. Once found in 10 different regions of the world, these magnificent forests are now found mainly in the Pacific Northwest of the United States, British Columbia and southern Alaska, with other areas in southern Chile and New Zealand's South Island and Tasmania, roughly 45% of what once existed worldwide (CI/Ecotrust, 1992).

Quite simply, this means that we have to set priorities and focus heavily on the richest areas currently at greatest risk. This may not always be politically expedient, but it is essential if global biodiversity is to be maintained. A number of methods exist for setting biodiversity conservation priorities. Of these, perhaps the best known and most widely used is the "threatened hotspots"

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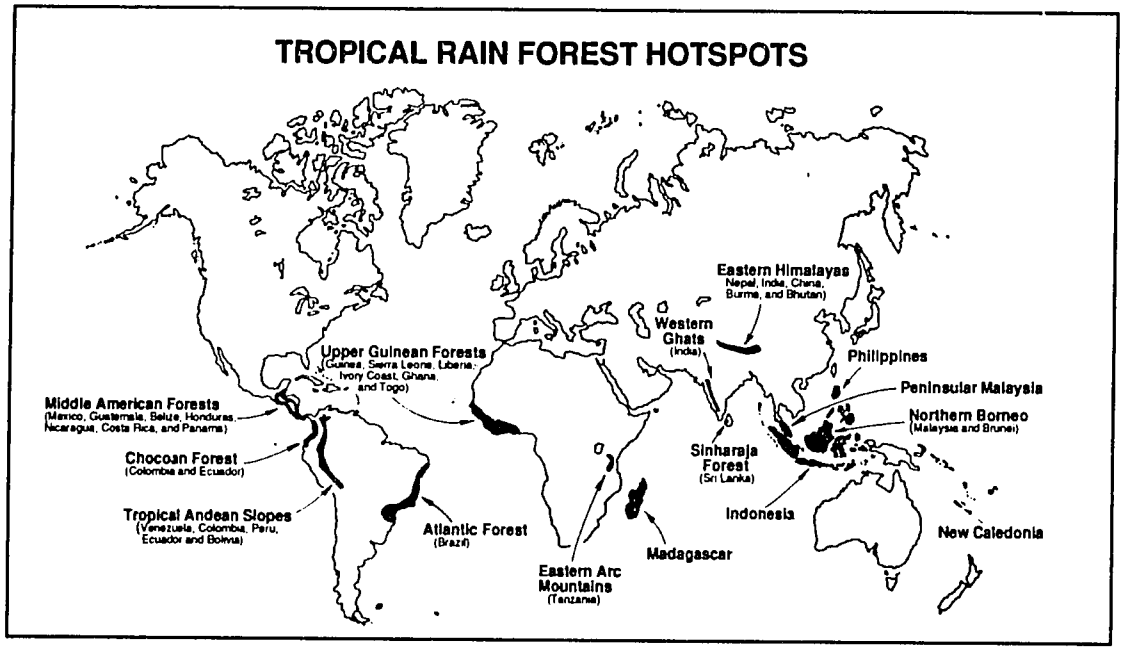

Figure 6. Tropical Rain Forest Hotspots. These areas cover approximately 4% of the planet's land surface, but harbor some 30-40% of terrestrial biodiversity and a much higher percentage of species at great risk.

approach, first conceived of by Norman Myers (1988) and subsequently revised by Myers (1990), the John D. and Catherine T. MacArthur Foundation and Conservation International. This approach is terrestrially-based, and focuses mainly on tropical rain forests because they are overall the richest of the terrestrial biomes.

In its latest form, the "threatened hotspots" analysis (Conservation International, 1992) recognizes some 15 top priority tropical rain forest regions for biodiversity that occupy only approximately 4% of the land surface of the planet, harbor at least 30-40% of all terrestrial biodiversity and a much higher (but as yet undetermined) percentage of species at great risk (see *Fig. 6)*. Although still a very preliminary analysis, the "hotspots" have provided very useful guidelines for action, and have been adopted as the main action agenda for both the MacArthur Foundation's World Environment and Resources Program and Conservation International.

While very useful in assessing terrestrial biodiversity priorities because such a large portion of land-based diversity occurs in tropical forests, the current hotspots analysis does not cover other important terrestrial biomes (dry forests, temperate rain forests, boreal forests, grasslands, wetlands, deserts, Mediterranean-type systems, mangroves, etc.). For the "threatened hotspots" approach to be truly comprehensive, the highest priority areas for these other biomes need to be determined as well.

This process is now underway at Conservation International, building on work by Myers (1990), and has already resulted in recognition of the importance of a number of non-rain forest terrestrial "hotspots" (*e.g.*, the Sonoran Desert, which probably is the richest desert ecosystem, the Pantanal, the Sudd Swamp in the Sudan, and the Okavango Delta in Botswana, which are globally important wetlands, southern California and the Cape Flora of South Africa as critically important Mediterranean systems, the lakes of the Rift Valley of East Africa as priority lacustrine systems, etc.).

Another way of looking at biodiversity priorities is by political units, in this case nations. The "megadiversity country" approach, first developed by Mittermeier (1988 in Wilson (ed.), Mittermeier and Werner, 1990) recognizes that a relatively small number of countries, some 12 out of a total of 194 (National Geographic Society, 1993) that currently exist, are home to an inordinately large share of the world's biodiversity and therefore have tremendous responsibility. Indeed, some very rough estimates indicate that these countries may have on the order of 60-70% of the planet's diversity within their borders, including not just terrestrial diversity, but freshwater and marine as well.

Several countries stand out as truly superlative, with Brazil, Indonesia, Colombia and Mexico topping the list, and others like Peru, Ecuador, Zaire, Madagascar, China, India and Australia following close behind. Most of the megadiversity countries are large, but several like Madagascar and Ecuador pack high diversity into relatively small land areas. In any case, whether large or small, the issue of a high level of international responsibility remains a key point of the "megadiversity" approach, and focuses national and international attention on the special biological wealth possessed by these countries.

Yet another approach that has been used to set biodiversity priorities is that of the centers of origin and/or diversity of major crop species, focusing on those agricultural resources that are of greatest use to our own species. These regions include both areas where our key crop species originated (and where the wild ancestors come from) and those that have the greatest diversity of other wild relatives. Sometimes these areas coincide, but occasionally they are different, as in the case of coffee, which originated in the highlands of Ethiopia and East Africa, but achieves great diversity of wild relatives in the eastern rain forests of Madagascar. Often these centers fall within the borders of megadiversity countries (*e.g.*, Mexico) or coincide with "hotspots" (*e.g.* Tropical Andes or Upper Guinean Forest), but in other cases they differ. Although a limited approach that focuses only on a handful of widely used species, it demonstrates clearly the value of biodiversity to the daily needs of our own species.

The last approach that we will mention here is that of the "major tropical wilderness areas," referred to as the "good news areas," by Myers (1988). Focusing again on tropical forests, these

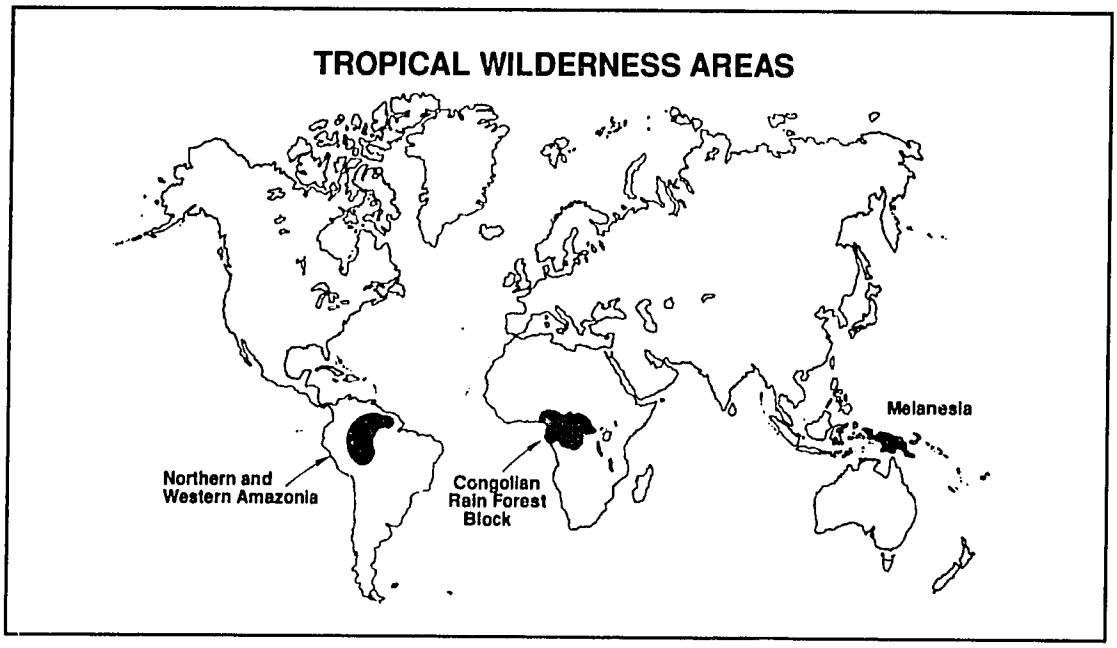

Figure 7. Major Tropical Wilderness Areas. These are the last remaining major blocks of intact tropical rain forest and serve as important storehouses of biodiversity. They are also some of the only places where indigenous people will likely be able to maintain their traditional lifestyles.

few areas represent the opposite end of the spectrum from the "hotspots". Whereas the latter consist mainly of heavily exploited ecosystems often highly fragmented and greatly reduced in original extent (usually 2-20% of original habitat remaining), the major tropical wilderness areas are those few large blocks of tropical forest that remain largely intact (see *Fig. 7*).

These wilderness areas have great importance as storehouses of biodiversity, as major watershed areas, and as controls against which we can measure the management of the more devastated "hotspots"; they are often the last places where indigenous people have any hope of maintaining a semblance of their traditional lifestyles; and they are likely to assume increasing recreational, aesthetic and spiritual value on an ever more overcrowded planet. Among the major wilderness areas that still exist are the southern Guianas, southern Venezuela and adjacent parts of extreme northern Brazilian Amazonia, parts of the upper Amazon in Brazil, Colombia, Ecuador, Peru and Bolivia, the Zaire Basin in Central Africa, and much of the island of New Guinea.

Other priority setting methods exist and each has its validity, but we believe that an expanded hotspots analysis that looks at other major biomes beyond the tropical rain forests (including marine and freshwater hotspots) probably has great value at this time and should be given considerable attention by institutions such as the GEF and the broader set of development agencies.

It is important to emphasize that priority setting should not be confused with triage, a term that unfortunately has been misused and misunderstood in biodiversity conservation. As originally conceived, triage referred to treatment of battlefield victims in World War I. Basically it recommended minimal attention to the most severely wounded (who would die anyway) and the least wounded (who would recover on their own), and maximum attention to that middle category of moderately wounded who were likely to recover with treatment. Applying this concept to biodiversity would mean writing off the hotspots and the major wilderness areas (and much of the worlds biodiversity) and focusing on the middle ground of moderately diverse, moderately threatened ecosystems. This, clearly, is not what we are recommending.

At the same time, it is essential to stress that we are not recommending a focus on the "hotspots" to the exclusion of all else. Each and every nation's biodiversity is important to its own viability and to the world at large, and we must do

...priority setting should not be confused with triage, a term that unfortunately has been misused and misunderstood in biodiversity conservation.

something to conserve these resources in all countries. What we are emphasizing is the need to recognize that certain parts of the planet have much higher concentrations of biodiversity than others, and these same rich areas often happen to be the ones at greatest risk. These high priority areas should receive a large share of our global investment in biodiversity conservation, perhaps even a share roughly proportionate to the diversity that they possess.

a biome encompassing several nations (*e.g.* Amazonia), a political unit like a country (*e.g* Papua New Guinea), or an ecosystem (*e.g.* the Pantanal wetland region of Brazil). This method consists of pulling together the published biological data, cartographic information and satellite imagery prior to a meeting, and then refining this information in a workshop format involving the leading experts on that particular region. Specialists often possess considerable knowledge that

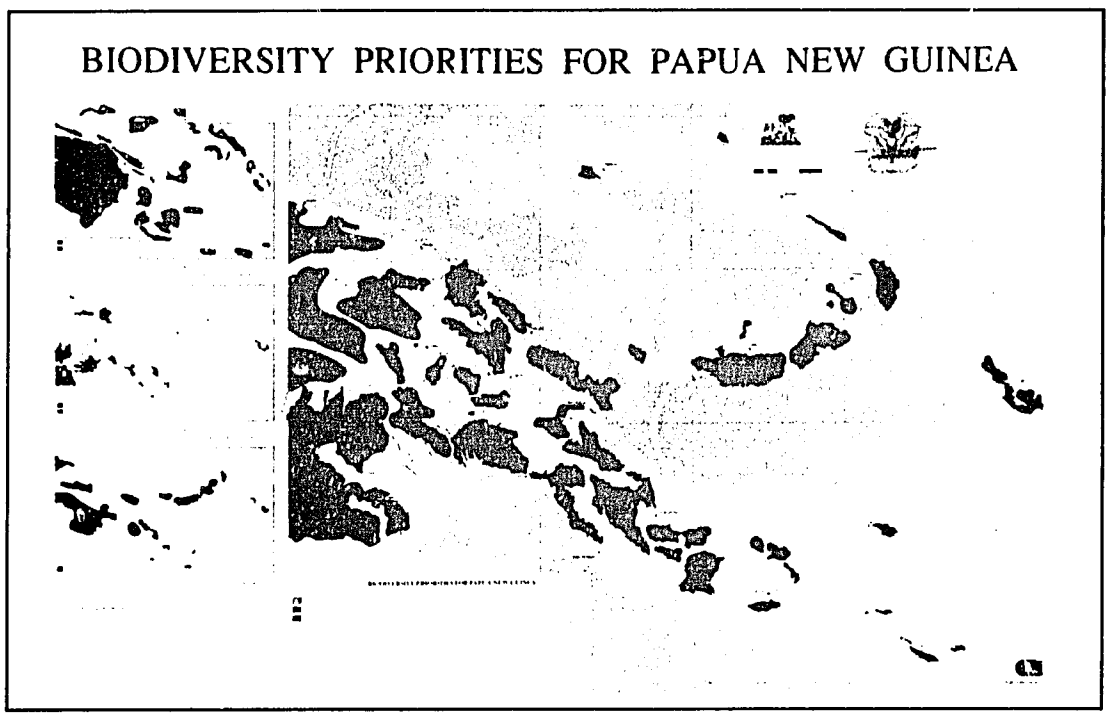

Figure 8. Biodiversity Priorities for Papua New Guinea. This is an example of regional workshops which are used to identify conservation priorities and gaps in knowledge. A similar project was completed for the Amazon basin in 1990 and a half dozen more are planned.

B. Regional, National and Local Priorities - the Hierarchy of Priority Setting

The foregoing discussion of priorities focuses on the global level. However, we also need to look at priorities at a more fine-grained level, regionally, nationally, locally, and by taxonomic groupings of plants or animals. This is what we refer to as the "hierarchy of priority setting," and can be carried out at various levels using several different approaches.

At a regional level, CI, in collaboration with several other organizations, has been developing the Regional Priority Setting Workshop as a conservation tool. Such an exercise can look at

they have not yet published, and the process of bringing them together to pool their information results in a dynamic, synergetic process that usually goes far beyond the sum total of individual expertise. The results of such exercises are then published, both in written and cartographic form, and have thus far had considerable catalytic impact.

Although follow-up processes of this kind should also integrate socioeconomic data, land use patterns and the like, we have found that it is best to avoid "mixing apples and oranges" and instead focus on getting the biological priorities right in the first step of the process. Other kinds of data can then be superimposed on the biological

foundation using a Geographic Information Systems (GIS) and thus develop meaningful, scientifically-based conservation action agendas.

Regional priorities setting workshops of this kind have already been carried out by CI for the Amazon Basin (in collaboration with the New York Botanical Garden, the Smithsonian Institution, the Royal Botanical Garden, the W. Alton Jones Foundation, and IBAMA, the Brazilian federal environmental agency) and Papua New Guinea (in collaboration the Papua New Guinean Department of Environment and Conservation, the Biodiversity Support Program of U.S. AID and a variety of local and international NGOs), (see *Fig. 8* & Conservation International, *Lessons from the Field, #1*, 1993). Other workshops of this kind are currently planned for the Brazilian *cerrado*, the northeastern, southeastern, and southern portions of the Brazilian Atlantic forest and Madagascar, with Central and West Africa under discussion as well.

In the near future, there will also be an increasing need for national biodiversity strategies, as required by Article 6(a) of the Biodiversity Convention and called for in the recent *Global Biodiversity Strategy*. A few preliminary plans of this kind have already been prepared for individual countries such as Suriname (Mittermeier *et.al.*, 1990) and Indonesia (World Bank, 1991). Other broader National Conservation Strategies were prepared in the 1980s as an outgrowth of the *World Conservation Strategy* (IUCN/WWF/UNEP, 1980) or under the auspices of such mechanisms as World Bank-sponsored National Environmental Action Plans and FAO-led Tropical Forestry Action Plans, but many of these are out of date and did not focus on biodiversity in particular. While such exercises may provide useful background, we highly recommend the Regional Priority Setting Workshop approach as a take-off point for creating the biological basis for development of modern National Biodiversity Action Plans.

Another approach to priority setting that focuses on species or groups of species is the taxon-based action plan effort that has been carried out by the Species Survival Commission of the World Conservation Union (IUCN). This commission consists of some 5,000 volunteer members organized into more than 100 Specialist Groups, and its groups have been in the process of developing action plans over the past eight years for organisms as diverse as lemurs of Madagascar (see *Fig. 9*), swallowtail butterflies and African elephants and rhinos. Twenty-five have appeared to date and others are in preparation. These focus heavily on the so-called "flagship species" or "charismatic megavertebrates," and can be considered basic "building blocks" for other planning activities

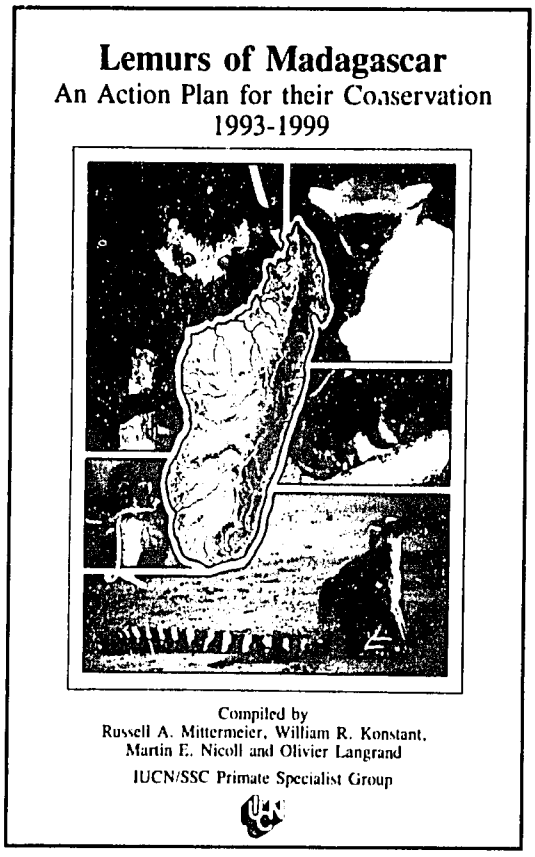

Figure 9. Lemurs of Madagascar Action Plan. These documents are produced by the Species Survival Commission of IUCN and serve as important building blocks for biodiversity conservation planning.

Priority setting exercises at all levels identify the huge gaps in our knowledge, which can be filled in two ways. The first is through "quick and dirty" rapid assessments that provide quality data in very short periods of time. The best example of the short-term approach is CI's RAP Team (for Rapid Assessment Program), which uses a small group of world class field biologists with cumulative tropical experience in excess of 100 years. They can be rapidly deployed to remote areas for

Regional Priority Setting Workshops can serve as the biological basis for modern National Biodiversity Action Plans.

periods of several weeks to several months to determine the "hotspots within the hotspots". This team was created in 1990, and has thus far carried out eight expeditions. (*RAP Working Papers 1, 1991 and 2, 1992*).

At the other end of the spectrum is the need for long-term continuous research on key ecosystems, which will enhance our understanding of how tropical ecosystems really function and what kinds of diversity they contain. The results of these studies are of little help in immediate priority setting exercises, but they will assume great importance in the future. As an added benefit, the "scientific presence" that they provide serves to add prestige to and enhance protection of the sites under study.

The GEF has created high expectations, most of which have gone unmet. ...the large size of promised or perceived GEF funding has in many cases brought about intense infighting and jockeying in many countries...

IV. Suggestions for Reform of the GEF Biodiversity Portfolio

What does this discussion of biodiversity, its uses, values and priorities for its conservation mean in terms of new directions for the GEF? Since the Earth Summit, national governments and international institutions have been slowly moving to take action on some of the recommendations of Agenda 21. However, Agenda 21 is a huge, lowest common denominator document, the practical implementation of which will take a long time to realize. Of more immediate concern to on-the-ground biodiversity conservation is the performance of the Global Environment Facility (GEF).

Since its creation in November 1990, the GEF has assembled a portfolio of some 44 biodiversity projects with a total value of approximately $300 million. This component accounts for 43% of the total GEF work program. Projects range in size from $1-3 million in nations such as Guyana, Cuba and the Seychelles to $25-30 million efforts in Brazil and Mexico (GEF, 1992).

1993 is a critical year for the GEF. By the end of the year, the GEF must complete its restructuring, evaluate itself and seek financial replenishment. In 1994, the Biodiversity Convention is expected to receive the necessary 30 ratifications and enter into legal force. High on the agenda of the newly formed Conference of the Parties will be its future financial mechanism. Just prior to the Earth Summit, the biodiversity negotiators accepted the GEF as the "interim" financial mechanism for the Convention. The final status of the GEF, in relation to the Convention and in general, will likely depend on the reforms it adopts and implements over the next year.

In this section, we identify some of the problems with the biodiversity component of the GEF, based on our experience to date. In the process, we make concrete recommendations as to how it could be dramatically improved and turned into a major positive force in global biodiversity conservation. Much of the experience we relate here comes from various levels of exposure to GEF projects in some of the 24

countries where CI and its partner organizations work on various biodiversity conservation issues.

A. Niche and Mission

What is the niche that the GEF seeks to fill in the area of biodiversity conservation? This is the principal question that the Facility must answer as it evaluates itself and seeks replenishment. At present, the GEF is a loose aggregate of different activities, a set of projects that are really a variety of experiments, some piggybacked on existing World Bank or UNDP projects and others standing alone. The GEF project portfolio reflects its poorly articulated mission, and a shifting set of objectives that has resulted from the political and institutional demands of its many constituencies.

In general, international funding for biodiversity conservation thus far has come from bilateral donors, specialized inter-governmental organizations and international NGOs and their foundation partners. The GEF must improve greatly its collaboration with and, at the same time, differentiate itself from these existing channels. Otherwise donor governments will likely choose their own bilaterals as the preferred vehicle for delivering biodiversity conservation assistance.

The problem with the GEF's approach to date is that it may do more harm than good. For example, the GEF's entry into biodiversity conservation has caused some other donors (*e.g.* several major U.S. charitable foundations) to consider reducing their own levels of support. However, because of the operational culture of the GEF Implementing Agencies, there may be an overall reduction in small-scale, NGO or community-based projects, which we have found to be the most effective for conserving biodiversity. The broader result may be a missed opportunity for the GEF to fulfill its original mission of finding potential donors to fund key conservation projects.

The large size of the GEF projects and relative inexperience of the GEF Implementing Agencies has created another unfortunate by-product in several countries. The GEF has created high expectations, most of which have gone unmet. These expectations and the large size of promised or perceived GEF funding has in many cases brought about intense infighting and jockeying among both the governmental and NGO communities in many countries as different players seek to gain advantage in positioning for access to GEF funds. The GEF must take a hard look at its niche vis-a-vis other existing players, and define a mission that plays on the strength of its Implementing Agencies without undermining the ongoing work of bilaterals, NGOs, and foundations that support biodiversity conservation.

B. Incremental Costs

The GEF was designed in part to carry out the funding provisions of the Rio treaties on climate change and biodiversity. Its specific mission was to fund the "incremental cost" of achieving a global conservation benefit by implementing the treaties. In other words, while the recommendations of Agenda 21 were to address current and future development expenditures, the GEF was to provide the additional funds above and beyond current expenditures to allow developing nations to provide a global conservation benefit that may *not be in their immediate national interest.*

It is our view that this explanation of incremental costs reflects a basic misunderstanding of the full range of biodiversity values discussed earlier in this paper. One can make the argument that global biodiversity ought to be conserved for its carbon sequestration function or its future biotechnological potential, but that misses most of the benefits that biodiversity provides. Of the six categories of biodiversity values we discussed earlier in this paper, only the first relates to a global benefit. Utilization of biodiversity principally provides national, regional and local benefits, not in the future, but right here and now.

The GEF's philosophical framework relating to incremental costs is therefore at cross purposes with the overall goal of biodiversity conservation, and winds up perpetuating the belief both in the World Bank and other international institutions and in developing countries themselves that biodiversity is not fundamental to a nation's economic viability. Nothing could be

Indeed, the GEF should be at the forefront of a movement to integrate biodiversity into the mainstream of the development process, rather than perpetuating a philosophy that ensures its continued marginalization.

Biodiversity conservation, to be successful, requires a more flexible and streamlined approach, with a much shorter project cycle and smaller initial investments that also have some mechanism to ensure continuity of funding.

further from the truth. The full range and value of current uses of biodiversity at all levels need to be recognized by the GEF, and further, used as a basic principle in all of its activities.

In our view, the notion of incremental costs may apply to global climate change or to ozone depletion (although even this is being debated), but it does not at all fit with biodiversity conservation. This fundamental philosophical problem with the GEF must be addressed if it is to have a positive impact on biodiversity conservation. Indeed, the GEF should be at the forefront of a movement to integrate biodiversity into the mainstream of the development process, rather than perpetuating a philosophy that ensures its continued marginalization. The GEF should serve as a vehicle to bring about basic change in its Implementing Agencies, and, through its influence with donor and recipient nations, change the way the world looks at biodiversity values.

C. Project Cycle

The need for resources in biodiversity conservation is immediate, especially in the highest priority areas at greatest risk. However, it is also a long term endeavor that requires a sustained, yet flexible, source of funding. The current GEF project cycle is too long and cumbersome to deal effectively with the urgency of this issue and lacks the agility needed to respond to the ever changing needs of biodiversity conservation. While the World Bank and its project cycle may be well suited to developing and managing large scale climate change projects that concern the entire energy sector of a given country, they are poorly suited to biodiversity conservation. Most of the expertise on biodiversity and the capacity to implement field projects rests outside the government sector, and requires small but rapidly disbursed funding with some measure of continuity beyond the initial GEF project period.

Over the past two fiscal years, out of a work program in excess of $700 million, the GEF has disbursed only $2.8 million to actual biodiversity projects, while spending more than $20 million on administrative expenses (GEF, 1992). The GEF has also been constrained by its requirement to channel funds only through central governments. These facts are in part a reflection of the nature of the Implementing Agencies of the GEF. Biodiversity conservation, to be successful, requires a more flexible and streamlined approach, with a much shorter project cycle and smaller initial investments, with a longer term mechanism to ensure continuity of funding.

Figure 10. A Guatemalan chiclero. Greater involvement of local communities and NGOs may be the key to the success of a restructured GEF. (photo: H. Castro)

Project review should also be placed more in the hands of national or international NGOs with long term experience in a country or project site. Use of consultants is fine if they have relevant experience, but very often consultants used to review projects know little or nothing of the areas they are sent to evaluate. The results are sometimes ludicrous. (e.g. a consultant sent to assess priorities in Brazil wound up recommending investments in two of the biologically least important regions in the country. This is particularly egregious in a country where priorities are reasonably well established and understood.)

D. Project Size

The absorptive capacity of the natural resources management sector of most GEF recipient countries is very limited. Nonetheless, many GEF projects propose to flood literally millions of dollars into sectors that are unable to use the money effectively over the short periods of most of the GEF projects designed to date. Indeed, we fear that the tendency towards large, single shot investments by the GEF will create overnight institutions that are likely to collapse when the international donor community turns its attention elsewhere.

Two examples are instructive. In Colombia, the GEF proposes to spend $9 million on conservation in the *Chocó*. While the *Chocó* is certainly among the highest biodiversity priorities on Earth, the GEF grant is some four times the size of the natural resource agency's annual budget and is devoted to an area with practically no infrastructure. In Guyana, the GEF proposes to spend $3 million to create a park in a country that currently has virtually no park service or infrastructure.

Rather than requiring a lengthy approval process for a single $10 million GEF project, we would prefer to see, for example, 10 $1 million projects, 20 $500,000 projects or even 200 $50,000 projects spread out over several years. A diversified approach would have multiple benefits. It would allow the GEF to build both governmental and non-governmental capacity, it would allow for smaller, more flexible projects, it would reduce destructive jockeying and political infighting, and it would make use of the real expertise that exists.

The GEF Small Grants Programme for NGOs is a good first step, but it represents only some 2-3% of the total GEF portfolio. It should be expanded in size and greatly streamlined, but it is just one part of the kind of approach that is needed. The GEF should adopt a much more flexible funding approach that relies primarily on small to medium sized grants to governments and NGOs alike, and incorporates mechanisms (e.g. trust funds and endowments) that ensure some continuity of support beyond the 3-5 year time frame of most GEF projects.

E. Trust Funds

With the GEFs emphasis on innovation, institution building and cost effectiveness as well as the pressing need for continuity of investments in biodiversity projects, the use of trust funds and endowments for biodiversity conservation seems a perfect match. Hard currency trust funds, for example, not only provide a hedge against currency devaluation, they also help to address our concerns about project size, project cycle, long term funding and emphasis on local capacity building. The GEF has already utilized this approach in Bhutan, Peru and several other countries. We recommend that it be considered in many other biodiversity projects as well.

F. Use of NGOs

Unlike global climate change, expertise in biodiversity conservation lies principally with local, national and international NGOs. The GEF must greatly enhance its efforts to involve NGOs and other civil sector participation in its biodiversity projects. Field-based NGOs in particular offer a wealth of technical expertise and local knowledge. It should become standard practice for the GEF to seek the advice of local, national and international field-based NGOs in project design and implementation.

In our experience, the GEF has sought input from NGOs, but thus far mainly in a piecemeal fashion that, in some cases, has resulted in infighting, rather than collaboration. The GEF should consider greater partnerships with structures like the IUCN Species Survival Commission has a volunteer network of more than 5,000 biodiversity specialists from developing and developed countries alike, and represents the single largest body of expertise in the world on this issue.

G. Priority Setting

As has already been discussed in the section on priority setting, distribution of the planet's biodiversity is very uneven, with certain areas having far higher concentrations of diversity and suffering far greater pressures. The GEF needs to recognize this and set priorities for action, rather than reacting only to political pressures or responding to projects on a first-come, first-served

After a decade of neglect, we are finally seeing political support in the United States for a national Biological Survey. The GEF is uniquely positioned to broker an international equivalent to help better define global biodiversity priorities.

basis. To do this will require developing a mechanism that incorporates the priority setting expertise of key NGOs and tailor them to the needs of the GEF (while recognizing that some degree of political accommodation will always be necessary).

The GEF needs to develop its own operational culture, more in tune with the times and the kind of activities it wishes to undertake.

One such mechanism might be the Global Biodiversity Assessment currently being discussed by the GEF and UNEP, in the latter's capacity as interim secretariat for the Biodiversity Convention. Building on background documents like the *Global Biodiversity Strategy* (WRI, IUCN, UNEP, 1992) and the *Global Biodiversity* (WCMC, 1992) prepared by the World Conservation Monitoring Centre in Cambridge, such a structure could incorporate the priority setting expertise of NGOs that have focused on this issue and come up with the most appropriate course for further GEF action.

The GEF should quickly signal its intent to create a true partnership with the array of NGOs that have taken a serious look at biodiversity conservation priorities, and form a more technically robust secretariat to process this critical information and complete a global assessment of our knowledge of biodiversity. After over a decade of neglect, we are finally seeing political support in the United States for a national Biological Survey to create a greater scientific basis for conservation and sustainable use of natural resources. Mexico, Australia and several other tropical countries have begun similar exercises. The GEF is uniquely positioned to broker an international equivalent to help better define global biodiversity priorities. As we have discussed previously under incremental costs, there is a real need for leadership on a key issue, a role that the GEF can assume if it chooses to do so.

H. Institutional Considerations

Recent history has seen a welcome trend toward democracy and public participation. The UNCED process afforded NGOs and the public unparalleled access to information and participation in the policymaking process. The GEF should make a greater effort to build on the UNCED model and hold public consultations with communities and constituencies likely to be affected by projects (a suggestion that applies not only to the GEF, but the international development process as a whole).

Although much of development assistance is theoretically aimed at alleviating poverty, it has in the past often exacerbated the problem because the intended beneficiaries were not involved in program design and implementation. T ansparency and information disclosure are critical parts of building public trust. The MDBs have a particularly poor track record in this regard. The GEF will become more effective and will be more respected if it provides public information at all stages of a project cycle. Biodiversity conservation is by its very nature a participatory and local endeavor; it cannot be brought about without the support of a diverse set of interests, beginning with the local people.

To be effective and become a politically viable institution, the GEF must do the same and make fundamental changes in its operating procedures. Many of the points we have made concerning project size, project cycle, use of trust funds and the role of NGOs all relate principally to the operational culture of the Implementing Agencies. The GEF Implementing Agencies may have appropriate experience to address other environmental challenges, but they are poorly suited to needs of biodiversity conservation. The GEF needs to develop its own operational culture, more in tune with the times and the kind of activities it wishes to undertake.

The GEF would also gain greater credibility by creating an independent secretariat and conducting a truly impartial evaluation. It was originally conceived as an organization that would act as a broker to identify priority conservation projects and potential funders. It would be more effective as such a facilitator of diversified funding approach, one that uses the strengths of the MDBs, bilateral donors, U.N. agencies, specialized intergovernmental organizations and the range of NGO project implementers, if its secretariat has a measure of independence from its current Implementing Agencies. Similarly, the GEF will send a strong signal to the international community if it agrees to undertake a fully independent and impartial evaluation of its Pilot Phase, with its Implementing Agencies acting solely as coordinators of such an effort.

V. Conclusion

Biodiversity conservation is the one major environmental challenge that cannot be addressed through technological innovation alone. In the GEF, the international community, for the first time, has significant financial resources available to conserve this poorly understood, fundamentally important living natural resource base. Now, more than two years into the Pilot Phase, valuable lessons have emerged, and these should be used to design a far more effective structure for future biodiversity conservation efforts.

More than anything else, the role of the GEF in biodiversity conservation depends on a clear definition of mission and niche, some distancing from the approaches and philosophies of its Implementing Agencies, greatly enhanced collaboration with the NGO sector, and the assumption of a clear leadership on this issue within the international development community. These comments apply to all aspects of the GEF, but are particularly germane to biodiversity conservation.

The opportunity to effect major change clearly exists, but it will require a dynamic process of introspection and restructuring to be truly successful. In years hence, the GEF could be looked upon as the institution that turned the tide in efforts to maintain the diversity of life on Earth; or it could be counted as just one more in an endless string of well-intentioned but essentially fruitless development programs so characteristic of the latter half of the 20th century.

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