WORLD WIDE FINANCING NEEDS OF PROTECTED AREAS SYSTEMS OF DEVELOPING AND TRANSITION COUNTRIES

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INTRODUCTION

Over the past few decades, considerable progress has been made in protecting biodiversity, reflected in an impressive growth in the number of protected areas, from a mere handful in 1900, to currently over 60,000, covering about 10% of the earth's land surface (UNEP_WCMC protected areas database 2003)[1]. Not all of those areas are nature reserves and national parks, but about half of them have as their primary objective to conserve biodiversity, while the other half have been gazetted for sustainable use of natural resources. It has also become universally recognised that the local communities and indigenous people surrounding and/or living in protected areas must be involved in the process of decision taking, management and most of all, benefit sharing and a large proportion of funding is dedicated to achieve this.

Departing from the logic of Arrhenius' (1921) universally accepted species-area relation ship expressed in the formula **S = cAz**, Vreugdenhil et all (2003) have scientifically argued that a worldwide coverage of somewhere between 10 and 15% could theoretically protect up to 60% - 80% of the world's currently surviving species. This would require that the land would be carefully selected on their ecosystem and species representation; this has only been done for a handful of countries. The currently protected areas are therefore more likely to secure the lower estimate, rather than the higher. The estimates, however, entail that - apart from reducing distribution ranges of most species – all ecological conditions within the protected areas remain rather unchanged. This will not be likely. If global warming is to set in – though still questioned by some – many species may experience ecologically changed conditions that can no longer support their survival. Some see indications that climatic changes have already set in, with Kerr (1999 and 2002) particularly outspoken as he writes that ``Miners have their canaries to warn of looming dangers, and climate change researchers have their arctic ice". He states that summer "would convert the Arctic Ocean from a brilliantly white reflector sending 80 percent of solar energy back into space into a heat collector absorbing 80 percent of incoming sunlight." In 2002, CNN posts an article on the Web, *Will ice melt open fabled Northwest Passage?*, based on Kerr 2002, suggesting that naval passage might become feasible in as little as 10 years, which would require an ice volume reduction of the Polar Icecap of up to 20%. Other authors are more conservative (e.g.: Prange 2001). The news, in March (2002), that an area half the size of Cyprus had broken off the Antarctic continent shattering the Larsen B. ice shelf into thousands of icebergs, took scientists by surprise and raised fresh concerns over the effects of global warming and future sea rise. Brown (2002) concludes that "Arctic sea ice is melting fast. Over the last 35 years, the ice has thinned 42 percent—from an average of 3.1 meters to 1.8 meters. Polar ice cover of the Arctic has also shrunk by 6 percent since 1978. Together, thinning and shrinking have reduced the mass of sea ice by half." A team of Norwegian scientists projects that the Arctic Sea could be entirely icefree during the summer by mid-century, if not before. If such scenarios would materialize at such a pace, much further melting would become likely, thus not only reducing solar reflection, but also the cooling effect of melting ice in the summer, thus speeding up further climatic change. This would have dramatic implications for the conservation of the species of the earth, as they become progressively locked up in protected areas. As species become increasingly dependent on those areas, their conservation depends on the management and protection of protected areas systems. If those systems can only conserve 60%-80% of the world's species under ecological stable conditions, the effect of climatic changes on species conservation needs close attention, as they can drastically alter the living conditions in protected areas.

It is difficult to predict the characteristics of climatic changes, and they are likely to vary widely across the earth. The effects on ecosystems and species may vary considerably as well. Sub-polar species may simply move closer to the poles (Parmesan 1996, 1999 and 2003), and probably quite a few species accustomed to large weather variations, such as temperate species and even savannah and deciduous tropical forest species may prove to be relatively resilient. If, on the other hand, humid tropical forests become drier as expected, they may transform into deciduous forests or even open savannahs, in which case tremendous species loss would seem un-avoidable. Many species would simply not survive a season of draught without foliar crown protection, while the increase in forest fires would further reduce species survival. Some extreme draughts during the last decade, suggest that such scenario is not impossible.

Whatever the local effects of a change in climatic conditions may be, it is likely to happen rapidly in geological terms. Whether it be a quarter or a full century, the change would be so rapidly, that many sessile species (all plants) as well as those species that depend on them as well as low mobility species (e.g. flightless arthropods, most amphibians) would be unable to follow the changing ecological conditions under fully connected conditions. As some 50% of the world's biodiversity lives in evergreen tropical forests, one would expect that the greatest biodiversity-loss might take place in those regions for reasons we explained previously.

1 The present author carried out his own analysis using the same data and came out with a lower land-cover than the official study carried out on behalf of the UNEP-WCMC, and given the senior experience and broad language knowledge of this author, his figures are probably more accurate.

Elsewhere in the world, species-loss might be somewhat less dramatic under changing climatic conditions. There is no formula to calculate species loss resulting from changes in climatic conditions, but in some regions, their effects may be at par with the conversion of habitat for human habitat purposes. If so, worldwide species conservation would probably be more in the neighbourhood of 40% - 60% **provided that ecosystems can be selected efficiently,** and that 10 – 15% of **the land can indeed be put under protection effectively**.

Effective protection requires that areas be managed by capable protected areas agencies (PAAs), governmental or private. This requires continuous and dependable funding, which currently is unavailable. Increasingly, managers of protected areas are raising their concerns, that bi- and multi-lateral financing institutions have become very much focussed on the social aspects of protected areas, while the needs of appropriately operating the protected areas systems is left up to national governments to deal with. Dramatic changes in climatic conditions as suggested previously, would make the need for adequate funding even more imminent and urgent.

Many donors appear to build on the expectation that decentralisation leads to automatic solutions; so far, this has not been proven to be the case. On the contrary, some examples from a recent WCPA web-dialogue may illustrate this to be a growing concern:

- Ghana Wildlife Division: ”However, in the exciting quest to gain local involvement, most conservation efforts are losing sight of the fact that the whole exercise is meant to COMPLEMENT rather than to SUPPLANT efforts in NPs.”

- Director Mexican Natural Protected Areas Fund Dr. Renée Gonzales Montagut (pers. com.: “In only half of the about a hundred national parks of Mexico, the Government has permanent staff, with a maximum of 5 in each”.

- Gustavo Suarez de Freitas, director of the Peruvian PA Service: “We have 24 of 56 areas with no staff at all, and at least the same number totally understaffed and underfinanced. Donors are less likely to support core budgets and more oriented to rural development”.

- A protected Areas manager in Ecuador: “Sustainable use projects in bufferzones are contributing little to management of the area, and raising expectations that often cannot be realised and sustained” Bruner, pers. com.).

There are no countries known where decentralisation has lead to increased financing of a representative protected areas system as a whole in such a way that the security of the country’s protected areas has improved.

THE COSTS OF PROTECTED AREAS SYSTEMS OF THE DEVELOPING AND TRANSITION COUNTRIES

Such alarming messages from within the WCPA encouraged the World Institute for Conservation and Environment (WICE) and Conservation International (CI) (Vreugdenhil presentation at the World Parks Congress 2003) to collaborate on the calculation of the management costs of protected areas of developing and transition (D&T) countries.

A small team of budgetary experts with considerable experience in administrative financial management carefully reviewed the financial module of the MICOSYS programme (Vreugdenhil et al. 1992 a & b, 2002, 2003). This is a computer tool with more than a decade of practical application in biological, socio-economical and financial protected areas system analysis; a special version was designed to model the worldwide costs of the protected areas of developing and transition countries. All developing and transition countries over 30,000 km2 (about the size of the Netherlands) - except the ones west of Russia - were included.

Departing from the area size, the programme generates cost totals for every individual protected area based on more than 50 cost factors, as well as for system-wide costs. Important factors include: A labour force of 20 % professional and administrative staff and 80% field staff (primarily park rangers), park infrastructure with furniture like some visitor centres, exhibitions, park entry ticketing booths, modest but decent ranger stations for the field staff, modest but decent social security arrangements, trails, trail signs, field transportation and communication equipment, uniforms and trails, monitoring and an endangered species fund.

The analysts used the latest crude data of UNEP-WCMC. After purification of double entries, all protected areas of countries were entered in the modified version of MICOSYS for most continental D&T countries over 3,000,000 ha. A few medium sized qualifying countries were not considered, as their data were not yet present in the last version of the data set.

Variation in salaries by country was estimated as follows: Data were used on salaries of PA staff from the countries: Madagascar, Honduras, Ecuador, Peru, Mexico, Cameroon, Bolivia (sources: ANGAP and FTHM Finance 2003, Vreugdenhil 2003, A. Bruner, pers. com, R. Gonzalez, pers. com., Culverwell 1997, Cammarata 2001. Salaries were converted to US $ using the average exchange rate from the year in which salaries were reported (range 1997-2003) (Oanda.com 2003). Salaries were then adjusted for inflation (Bureau of Labor Statistics) and corrections made to reflect Purchasing Power Parity (PPP) differences between countries (World Bank). Finally the median PPP was calculated for the salaries of park rangers and academic staff. Then a model was constructed to predict salaries using median PPP salaries multiplied by each country's PPP adjustment, to calculate an estimate of salaries in actual

dollars for each country. This model resulted in a significant regression ($p<.05$, adjusted $r2=.67$) for guard salaries, although the model could not explain salaries of academic staff, which had greater variance.

WICE and CI expected to find that recurrent costs would run between 2 and 3 billion dollars per year. It came as a great surprise to the analysts that the recurrent costs amounted to $ 1.1 billion per year; about 80% of those costs are for field staff and their operations, housing and transportation. Not included in the study, were the costs for technical assistance and the financing of related socio-economic programmes for local communities.

Table 1: "Costs per Region" provides an overview of the needs of the D&T countries for a modest basic operation of their protected areas systems. As it turned out, also the investment requirements are much lower than originally expected.

Table 1: Costs per Region

COST PER REGION

REGION	Total Investment Costs	Total Recurrent Costs
CENTRAL AMERICA	$114,509,658	$70,621,848
SOUTH AMERICA	$447,809,857	$300,667,955
WEST AFRICA	$131,760,833	$53,250,993
CENTRAL AFRICA	$116,374,236	$55,403,891
EAST AFRICA	$384,649,565	$196,098,737
WEST ASIA	$83,305,629	$55,740,337
NORTH-CENTRAL ASIA (including Russia)	$456,930,048	$206,618,528
SOUTH EAST ASIA	$354,381,414	$143,834,691
TOTAL	$2,089,721,240	$1,082,236,979

The total recurrent costs amount to 2 billion dollars, assuming that no investments have been made as yet, meaning that the total required amount is lower, since many countries have already put infrastructure in place.

WORLDWIDE AVAILABLE FUNDS FOR BIODIVERSITY CONSERVATION

'In a trend that reflects encouraging progress, development agencies are increasingly recognizing that maintaining ecosystem functions and biodiversity is vital to the long-term success of poverty reduction efforts" was an important conclusion from a study carried out by Lapham & Livermore (2003) of Conservation International. This has strengthened the substantive and political case for integrating biodiversity concerns into the broader development agenda. Unfortunately, an apparent side effect is diminished financial support for long-proven conservation actions that most conservationists agree are fundamental to maintaining the full array of biodiversity. Biodiversity funding is now driven primarily by social and economic objectives, which are not necessarily synonymous with objectives such as avoiding extinctions or protecting unique and biologically diverse landscapes.

"The international community's" approach to biodiversity has changed over the past 10 years. Biological diversity is now considered as an essential part of efforts to eradicate poverty and achieve sustainable development" (CBD Secretariat 2003). Over the past decade, poverty reduction has become an overriding priority of the World Bank, UN agencies delivering development assistance, and many other multilateral and bilateral aid agencies. Subsequently, international biodiversity assistance increasingly depends on the extent to which it can be justified within a poverty reduction context.

Table 2: "Average annual bilateral official development assistance (ODA) reported to the OECD 1998-2000 (US$ millions)" provides some insight on the financing biodiversity for the period 1998-2000. The second column lists the costs as defined for the Organisation for Economic Cooperation and Development's (OECD) Creditor Reporting System (CRS) for biodiversity. The "biodiversity" purpose code within the environment sector is defined as "including natural reserves and actions in the surrounding areas [and] other measures to protect endangered or vulnerable species and their habitats (e.g., wetlands preservation)", which may and probably do include many socio-economic programmes for securing benefits from protected areas.

Table 2: Average annual bilateral ODA reported to the OECD 1998-2000 (US$ millions)

Country	CRS "Biodiversity" code purpose	Aid targeting the Rio conventions including CBD
France	7.7	44.7
Germany	33.2	275.6
Japan	5.6	144.1

The Netherlands	20.3	146.9
United Kingdom	2.1	23.9
United States	44.7	84.2
Total	113.6	719.4

Source: CRS searched by donor country for "Biodiversity"-coded spending (OECD 2003a); Aid targeting the Objectives of the Rio Conventions 1998-2000 (OECD 2002a).

The third column lists the financing of the total funding defined as "Rio Markers" in support of the CBD and other Rio Conventions. Donors reported the "biodiversity-related aid" they had provided in a range of sectors, including general environmental protection, forestry, fishing, water supply, and agriculture and the report did not require donors to disaggregate specific, direct biodiversity spending and should be regarded as one of many components as well as some funding for projects where biodiversity was the central component.

Given the broad definition of the Rio Financing Markers, it is likely that the amounts presented in the third column don't reflect the financing actually spent on achieving biodiversity conservation.

Development agency representatives often describe their biodiversity programmes - which tend to focus on rural livelihoods, productive sectors, and other forms of poverty reduction - as complementary to Global Environment Facility (GEF[2]) biodiversity investments.

As development agencies direct most bilateral biodiversity assistance and financing, it seems clear that bilateral biodiversity funding will gradually be reduced to activities that only marginally contribute to biodiversity and as a result, any biodiversity conservation effort will increasingly depend on GEF financing, contributions from private donors and internal national government funding.

Financial support for protected areas has not kept pace with growing need from areas added to the protected areas systems. The world's largest source for biodiversity financing is the GEF. Between 1991 and 1999, GEF (report on its website) allocated $991 million in grants and mobilized and additional $1.5 billion in co-financing for biological diversity projects. This amounts to approximately $280 million per year. However, usually no more than one quarter to one third (interviews with several task World Bank task managers) is spent on the operational needs of protected management administrations, being about $70 - $90 million per year. The total spending of bilateral donors is more difficult to track. In their study, Lapham & Livermore have made an elaborate effort, but due to the fact that for most governments biodiversity financing is not an explicit financing code, the factual situation remains rather unclear.

2 The GEF is the primary financing instrument to achieve the agreements of the 1992 United Nations Conference on Environment and Development held in Rio de Janeiro, including the closely linked Convention on Biological Diversity.

THE IMPORTANCE OF STAFF IN THE FIELD

In 2001, Bruner et al., published a study in Science Magazine on how well strictly protected areas (parks and reserves), measure up among alternatives and analyzed the main factors of their success. Their study indicates that protected area effectiveness – particularly measured in remaining and/or recovering forest cover - correlated primarily with density of rangers. Effectiveness was also significantly correlated with the level of deterrents to illegal activities in the protected area. Deterrents were measured as the product of the probability of apprehending violators when guards detected a violation (either in progress or after-the-fact) by the probability of the violator receiving a sanction if apprehended.

Other factors potentially related to protected area success did not correlate significantly with effectiveness, including accessibility, local support, quantity of on-going research carried out, percentage of the protected area contested, number of staff working on economic development or education, and local involvement of communities in protected area management. While more study of these issues is obviously necessary, this work provides important evidence of the critical need to facilitate the permanent presence of field staff.

A NEW FINANCING AND STAFFING APPROACH

After the considerable sacrifices from the part of the D&T countries to set aside as much about 10 % of their lands as protected areas, it cannot be assumed that they can effort to bear all the costs of the management of their protected areas. The economically strong countries, have pressed hard at the conference of Rio de Janeiro that the D&T countries would set aside natural areas for conservation, with a recommended target of 10%, set at the World Parks Congress in Bali. Expected changes in climatic conditions make their effective management and protection increasingly urgent, as both unique ecosystems loss and climate change would –probably contribute equally to species loss.

The wealthy nations cannot reasonably expect that the D&T countries assume all the costs of the management of all those areas all at once. Moreover, since the wealthy countries are the largest contributors of the root cause of climate change. At least for some time, they should make a substantial contribution to investments in and maintenance of the protected areas of the D&T countries.

In spite of their difficult budgetary situations and high demands on financing a large variety of social needs, the governments of D&T nations will have to start making their own contributions as well. Neither should D&T countries consider cost-sharing by economically strong countries a perpetual right, and it is in the interest of both D&T countries and economically strong countries to work with a concept of phasing out biodiversity conservation funding assistance, maybe over a period of 20 - 45 years. After all, more and more countries are benefiting from a steady increase in tourism, which for an important part is based on the tourism attraction value of the beauty of nature. Over the last decade – with ups and downs – many developing countries have seen their revenues from tourism reaching the top 4 positions of their foreign currency earning sources. Investing in one of the main factors to attract tourists is well justified and developing countries cannot expect all financing of biodiversity conservation to come from the economically strong countries.

Within such understanding it is recommended that funding for biodiversity conservation of both bilateral and GEF funding becomes much more focussed directly on the financing of the operations and management of protected areas by directly financing the mandated Protected Areas Agencies – public or private - **for hiring field staff and their equipment**. Such financing however, should not stand in a vacuum and should be made part of co-financed programmes for poverty alleviation and empowerment of local communities.

Assuming an annual need of $1,1 billion to run the Protected Areas Systems of the word's D&T countries, a tight collaboration between bilateral donors, private donors (WWF, CI, FFI, TNC) and national governments of D&T countries could probably come a long way in filling the gap. These are expenditures that need to be made by the mandated Protected Areas Agencies (PAA) to carry out the vital tasks such as

- Interfacing with local communities,
- Help local communities to accrue economic benefits from the protected areas,
- Provide environmental education to the schools of local communities,
- Attend to visitors who are the source of economic benefits for local communities and help co-finance the operation of the area through entry fees, and
- Enforce the law – although in most areas with adequate field staff law enforcement is rarely necessary.

A manageable scenario would require a country-by-country approach in which the current staffing expenditure be analysed and total needs be budgeted. Every D&T country would have to make a minimum contribution. In such scenario, the poorest countries would be required to contribute no more than 30%, while mid-range poor countries would for example start to contribute with 40% and the wealthiest D&T countries 50%. Such an approach would bring the world-wide financing need at an estimated $750 million per year initially. Those amounts should not be a permanent requirement, but rather a phasing-out formula in which the wealthier D&T countries would receive protected areas agency financing for no more than 20 years, while the poorest D&T countries would receive financing for up to 45 years, while each year of the financing period, the funding contribution would diminish with an proportionate reduction of the financing duration. Contributions would be subject to conditions of providing the adequate counterpart funding from the country itself, in which external funding (bilateral or private donors) would not qualify. Under such scenario, biodiversity funding of protected areas agencies with their protected areas would become a viable proposition, while co-financing schemes would focus on poverty alleviation and empowerment of local and indigenous communities.

As explained, the largest financial component in a protected areas agency budget is staff, 80% of which is field staff, which adds up to about 60% of the total recurrent costs. A complicating factor in biodiversity conservation is the IMF assistance to most developing countries to reduce government expenditure and staff. In most countries this policy has rendered building an effective protected areas agency impossible, as all government institutions are forced to reduce rather than to increase budget and staff. The environmental sector in general, and the biodiversity sector in particular is a new sector compared to health, education, infrastructure, etc. Imposing budget and staffing cuts on a new sector that never even has had the chance to get established to begin with, may lead to the virtual elimination of such sector before it gets started. A dramatic example is the case of Honduras. Figure 1 and Table 3, that clearly indicate how both the budgets and staff allotments of the country's PAA have decreased over the past decade, to a level where the agency has become totally dysfunctional. The reductions have taken place in the context of IMF-induced general government staff and budget cuts. In discussions with IMF staff that we have had on this issue in the past, it was always emphasized that the IMF does not impose any rules on governments on which sectors to cut and that governments are at liberty to spare their environmental sector. We cannot escape the inference however that there is a structural discord between the internationally agreed IMF induced general government budget and staff cuts imposed on governments as conditionality for IMF structural adjustment programmes and the also internationally agreed target for conserving 10% of the worlds lands as protected areas. As it stands now in most developing countries, the IMF programmes have an unintended but devastating impact on biodiversity conservation and is one of the most significant factors in the way of effective biodiversity conservation. The institution cannot continue to close its eyes for these effects and should enter into a serious dialogue on how it can mitigate its effect

and in stead become a partner in the search for a solution to the problem of developing and nurturing effective protected areas agencies.

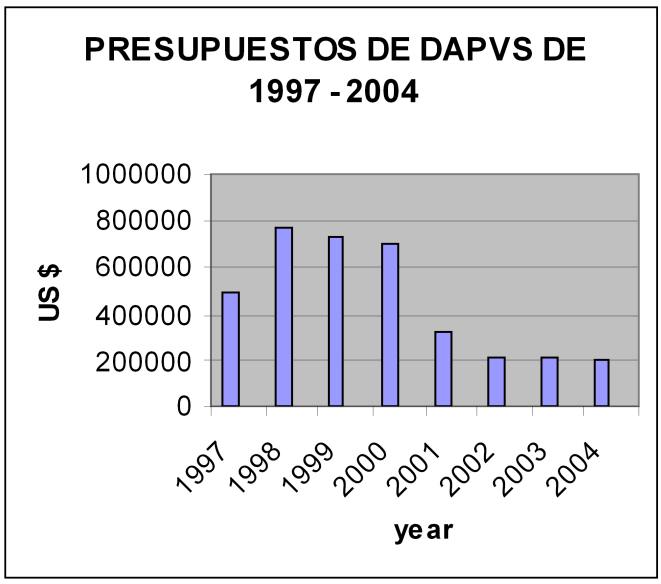

Figure 1: Budget of Hondura's Protected Areas Agency over the past 8 years. Source AFE/COHDEFOR.

Table 3: Staff reduction of Hondura's Protected Areas Agency over the past decade.

YEAR	STAFF
1995*	103*
1996*	103*
1997	no data
1998	no data
1999	No data
2000	77**
2001	67**
2002	31**
2003	26**
2004	26**

* Director during that period

** AFE/COHDEFOR staff division

If on the other hand, the world will continue to by and large ignore protected areas agencies and their important tasks, most efforts of biodiversity financing would probably be end up in vain and the world's biota would reduce to an even lower percentage than under a rapid climate change scenario.

As the GEF biodiversity component is the largest financing mechanism in the world for biodiversity conservation, it seems paramount that GEF would put strategically redirect its financial resources in such a fashion that all elements of biodiversity conservation be financed by taking the following measures:

1. Use its financing mechanism to the greatest extend possible in co-financing with other ODA sources that are primarily oriented towards socio-economical development, whereby the GEF finances would be focussing on financially supporting the protected areas systems development and operation of the target country.

2. Finance comprehensive protected areas system composition analysis for the target countries to ascertain the most efficient way of conserving the extremely scarce available resources, both financially and in land needs, to that for each country the maximum species conservation be achieved.

3. Carry out a more detailed world-wide financing needs analysis to address biodiversity financing needs more strategically and set up a permanent financing needs monitoring system for each of the target countries.

4. Initiate strategic ODA/Development Bank/National Government financing partnerships to establish long-term financing accords, which would allow durable Protected-Areas-Agency-building.

5. Initiate a broad-based adopt-a-ranger programme through which a wide range of service clubs (Rotary, Lions Club, Round Table, etc.) and conservation organisations collaborate in financing and placing parks rangers under the supervision of the mandated Protected Areas Agency.

6. The IMF needs to assume an active role in assigning government staff to the environmental sector by:

    1. Elaborating a model for its government assistance programmes in which the new biodiversity sector gets a specific place, which allows the development of functional protected areas agencies;

    2. Participating in the financing partnerships mentioned under point 4;

    3. In its negotiations with governments structurally seek advice on it potential impact of its programmes on the protected areas system.

The World Wide Fund for Nature (WWF) published a manual (Hansen et al.c 2003), that can be downloaded from the internet, in which it also targets to reduce Carbon dioxide reduction by focussing on electrical power generation under the code name "Power Switch". This is obviously an important additional necessity as well as the recommended reduction of all non-climate stresses. It also recommends active pilot projects to begin testing climate resilience-building strategies, but we doubt whether the latter is a useful approach for most developing countries while there still is such a vast shortage of field staff to provide protection from total habitat conversion. Resilience building only becomes useful after habitat conversion for alternative land-use has been brought under control.

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