

A new approach to Incentives under the Convention on Biological Diversity

by Jeffrey A. McNeely

Eighth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP8), Curitiba, Brazil, 20-31 March 2006

1. Introduction

The COP and SBSTTA of the Convention on Biological Diversity have gotten bogged down on the issue of incentives, particularly through efforts to link incentives to the international trade agenda. While the international dimensions are critically important, it appears that the Parties have reached a dead end, or at least an impasse, on this issue. IUCN certainly encourages the Parties to continue their negotiations, but in the meantime, we would like to offer some suggestions on how to implement the very straightforward Article 11 of the CBD, on Incentive Measures. This Article states that, "each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity."

Article 11 recognizes that command and control mechanisms, while necessary, are not sufficient for conserving the level of biodiversity required for the welfare of society. Many incentive measures can be adopted at the national level to implement this Article, without further reference to the COP or SBSTTA. We put these suggestions forward for consideration by the individual Parties, in hopes that they might be implemented at the national level. The results could subsequently be brought to the Conference of Parties or SBSTTA as a basis for a new and less contentious approach to the issue of incentive measures.

This paper should not be taken as any weakening of support for further discussion at the international level of incentive measures such as an environmental taxation mechanism, or as anything but the strongest of support for the CBD in its relations with the World Trade Organization. We very much agree that the CBD should request the WTO to avoid any measures that may undermine the objectives of the CBD, and that national CBD focal points engage in productive dialogue with their WTO counterparts toward this end. But we also recognize the resistance of some Parties to these negotiations, so we offer these suggestions as an interim measure to conserve biodiversity and support the objectives of the CBD while the sensitive negotiations with the WTO continue.

For more information, please contact :

Jeffrey A. McNeely
Chief Scientist
Tel: ++41 (22) 999-0284
Fax: ++41 (22) 999-0025
jeffrey.mcneely@iucn.org

IUCN World Headquarters
Rue Mauverney 28
1196 Gland, Switzerland
Tel: +41 22 999 0000
Fax: +41 22 999 0002
mail@iucn.org
www.iucn.org

The opinions given herein belong solely to the author and do not represent the views or policies of IUCN.

Incentives for the Conservation and Sustainable Use of components of biological diversity

Incentives motivate desired behavior, and disincentives discourage behavior which is not desired. For the purposes of the CBD, an incentive can be any inducement which is specifically intended to incite or motivate governments, local people, to conserve biological diversity, use biological resources sustainably and equitably share the benefits arising from the use of genetic resources. Incentives are used to divert resources such as land, capital and labor towards implementing the CBD objectives, and to facilitate the participation of people in work which will benefit biological resources. A perverse incentive induces behavior which depletes biological diversity, though of course such perversity often is in the eyes of the beholder (Myers and Kent, 2001). A disincentive in the context of the CBD can be any inducement or mechanism designed to discourage governments, local people, or corporations from depleting biological diversity.

Economic incentives can take numerous forms and can be categorized in many ways. A taxonomy of the various sorts of incentives is presented in Box 1, along with examples of the kinds of incentives that might be relevant at community and national levels. This table could have been much more complex and detailed, but is sufficient to indicate the major headings under which the various types of incentives can be placed. The most effective incentive packages will likely fall in more than one category. Disincentives include taxes, fines, and penalties of other types (which are usually administered through legislation) as well as public opinion or peer pressure (the use of which is far more subtle). Together, incentives and disincentives provide the carrot and the stick for motivating behavior that will support implementation of the CBD.

A major objective of using incentives is to smooth the uneven distribution of the costs and benefits of conserving biological resources; rather than suppressing the symptoms of resource misallocation, they address the cause of such abuses through providing a means of reaching compromise on substantive conflicts over biodiversity. They can maintain biodiversity by mitigating anticipated negative impacts on local people by regulations controlling exploitation of biological resources, and compensate people for any extraordinary losses suffered through such controls. They also improve the status of biodiversity by rewarding the local people who assume costs of conserving biodiversity ("externalities") through which the larger public benefits. Finally, they can open up the decision making process to the people who are most directly affected by conservation of biological resources. In correcting market failures, incentives provide a policy tool for overcoming some of the major constraints to biodiversity conservation activities such as reforestation, wildlife protection, and protected areas management. They can convince villagers, industry, and governments of the benefits of such efforts, and provide the financial means to implement them, the legal support for addressing land-tenure or land-use problems, and the financial and technical capability to develop productive systems which do not deplete biological resources.

Form and Function of different types of incentives

Direct incentives are applied to achieve specific objectives (e.g., to reduce poaching of protected wildlife, to improve management of a protected area to improve agricultural practices, to promote sustainable utilization of forest resources). Direct incentives can be either in cash or in kind, but in any case should be conditional on changed behavior toward biological resources. Direct incentives are often linked to specific rewards; direct income supports to farmers, for example, can be linked to a program of land retirement on environmentally sensitive lands.

Box 1: Examples of Economic Incentives for Conserving Biological Resources		
Type of incentive examples:	<u>Community</u>	<u>National</u>
<i>I. DIRECT INCENTIVES</i>		
1. In cash	Subsidies for reforestation	Research grants
2. In kind	Food for work In a reserve	Forest concessions
<i>II. INDIRECT INCENTIVES</i>		
1. Fiscal measures	Compensation for damage by wild animals	Price support for intensive agriculture
2. Provision of services	Community development	Conservation education
3. Social factors	Enhanced land tenure	Training for staff

Direct Incentives in Cash. Not surprisingly, direct cash subsidies are often the most welcome, since they can be used in the most flexible way. They include fees, royalties, rewards, grants, income supports, subsidies, loans, and daily wages. In the sense of Article 11, such cash awards function as incentives only when they are clearly and overtly linked to changes in behavior, and specifically toward behavior which implements the CBD. Cash disincentives include penalties and fines. The major problem with direct cash incentives is that they may produce long-term disincentives to conserving biological diversity by creating a dependency on outside aid. The proper use of cash incentives is to provide those affected with a sense of empowerment and responsibility for their own destiny; cash incentives which promote self-sufficiency with minimal dependence on outside aid and inputs should be favored. Payments for ecosystem services are becoming much more popular as incentives for improved resource management practices (Swingland, 2002).

Direct Incentives in Kind. Direct incentives in kind include material goods which are delivered to institutions, communities or individuals in return for their contribution to biological resource conservation and rehabilitation works; or in return for their refraining from activities which damage biological resources. Other direct incentives in kind include food-for-work programs, equipment donated to protected area management authorities, timber concessions (accompanied by appropriate conditions on extraction), and providing access to certain protected resources under certain conditions (often in buffer zones around protected areas). Direct in-kind disincentives might include jail sentences, confiscation of land or elimination of use-rights, as in mandatory retirement of marginal land.

Indirect incentives encourage behavior which conserves biological resources or generate resources for conservation efforts without any direct budgetary appropriation for biological resource conservation from the government or other sources. They involve applying fiscal, service, social, and natural resources policies to specific conservation problems and may involve providing preferential treatment in trade agreements, price supports, or land tenure.

Fiscal measures. Fiscal policy is concerned with gathering income to meet public expenditure in support of conserving biological resources, complementing economic policy measures which promote investment, production, and employment related to sustainable use of biological resources. Fiscal incentives are a legal and statutory means of channelling funds towards activities implementing the CBD, involving such indirect measures as tax exemptions or allowances, insurance, guarantees, tariffs, and price supports. At the international level, so-called "debt swaps" and foreign assistance projects can provide fiscal incentives to governments.

Provision of services. When a government has decided that certain biological resources or areas are of outstanding value to the nation as a whole, it can consider what sorts of services it might be able to provide to the communities most directly affected by any restraint on use. As incentives for changing their behavior regarding the biological resources to be protected, such communities can be provided with accelerated development activities in recognition of their contribution to national objectives in conserving biological diversity. Governments may decide that public opinion could be so important in promoting conservation of biological resources that it is willing to invest in major public education programs.

Social factors. Social incentives are designed to improve the quality of life of the community or nation, ensuring that benefits from biological resources are equitably distributed. They include a wide range of measures aimed at developing a harmonious and sustainable relationship between people and biological resources, including enhanced land tenure, training and education, employment in activities related to biological resources, building up of institutions to manage biological resources, and information on the status and trends of biological resources (Borrini-Feyerabend, 1996, 1997; Borrini-Feyerabend *et al.* 2004).

The Problem of Perverse Incentives

Introduction

The preceding discussion has shown that economic incentives can play a very major role in promoting more effective conservation of biological resources. However, to date economic incentives have been far more pervasive in over-exploiting biological resources than conserving them. An economist at the World Bank has identified one of the main problems: "The relevant decisions are frequently made by a small, politically influential group with interests in commercial logging, ranching, plantation cropping, and large-scale irrigated farming operations. As a result, the prevailing systems of investment incentives, tax provisions, credit and land concessions, and agricultural pricing policies tend to favor those in power, causing losses for the economy as a whole, and at the same time damaging the environmental and natural resource base" (Warford, 1987).

Any subsidy has the effect of lowering market price and thus making the gap between social and market price even wider; a subsidy on a resource will cause more of the resource to be demanded, because the price is lower than it otherwise would be. If the use of that resource already generates external costs for the environment, then the subsidy will make things worse.

Sound economic planning would involve maximizing total benefit from all possible direct and indirect uses of biological resources over the long run, accommodating the needs and values of all interest groups, whether or not those values are reflected in market transactions. "Government policies frequently violate this criterion," says Repetto (1987). "By manipulating tax codes, public credits, and charges for the use of public lands, they typically create fiscal burdens for taxpayers, while sacrificing long-term economic welfare and wasting forest resources." Improving such policies can enhance long-term economic benefits, provide more effective conservation of biological resources, and reduce fiscal burdens on governments.

Major Economic Incentives for Depleting Biological Resources

The world is replete with examples where unsustainable uses of biological resources have been justified by arguments based on economics. In most parts of the tropics, the opening up of forest areas is supported by powerful economic incentives in the form of state-sponsored road-building programs which facilitate access to markets and thereby increase potential profits from converting forest to agriculture or grazing. Further, resettlement of poor people in the remote forested areas opened up by roads is often politically preferable to genuine land reform which involves the redistribution of existing agricultural lands.

Many incentives aimed at stimulating production have significant external costs. For example, in China, the harvest of musk from wild musk deer is stimulated by high prices offered by the Department of Primary Production; but the snares set for musk deer also capture giant pandas, snow leopards, and other protected species (and indeed the musk deer itself is a protected species). When government policies conflict, the cash incentive often outweighs the disincentive of fines or jail sentences. In the Chinese case, killing a panda can carry the ultimate disincentive of a death sentence for the poacher, but pandas are still being killed in snares set for musk deer.

Examples of perverse incentives could be drawn from virtually anywhere, but the following suggest the kinds of problems that have arisen.

Schumann and Partridge (1986) have presented numerous case studies demonstrating that Latin American governments and international development agencies have tended strongly to support policies which encourage land settlement in tropical forest areas, through road construction and other forms of subsidy. Converting coffee estates to cattle ranches has increased unemployment in the highlands of Chiapas, Mexico, thereby encouraging many peasants to settle and clear new land in the forested lowlands (in turn depleting biological resources); and mechanised soybean production in Brazil and Paraguay has displaced many small farmers, who have moved on to settle in previously forested areas. Ledec and Goodland (1986) conclude that governments wishing to settle their forested frontiers may consider it desirable to reduce employment options on existing agricultural lands, thereby providing a perverse incentive through ensuring an ample pool of settlers willing to risk the hardships of frontier life in order to make a living. Further, in many parts of Latin America, landowners or land claimants who do not clear the forest often risk losing title or other legal rights to the land.

The implications of such policies for biological resources are apparent. But the package of incentives for forest conversion is justified by governments which suffer from over-crowded cities and are blessed with a sparsely populated hinterland, as a sacrifice which will generate capital to support development in the newly-settled lands.

The Government of Indonesia has a similar problem, being faced with severe over-crowding in Java, Madura, and Bali (Java alone has 120 million people living on a land area equivalent to New York State or Greece). Its transmigration program has sought, as a policy objective, to move poor farmers from these inner islands to settle areas in the outer provinces of Sumatra, Kalimantan, Sulawesi, and West Papua, which are currently under forest and occupied by relatively sparse populations of shifting cultivators. Such policies incorporate various economic incentives to clear forest land, thereby reducing biological diversity. In effect, rising population has forced the Indonesian Government to convert its wild forest capital into uses that it hopes will provide durable benefits to larger numbers of people.

Using subsidies to intensify agriculture in Indonesia's more densely-populated areas has also caused negative impacts on the environment. For example, subsidies on pesticides have led to their over-application, with consequent pesticide poisoning incidents (one causing 18 deaths from a single village), loss of insect predators (which means reappearance of the pests), toxic effects of fisheries, and the breeding of "superpests." When a number of pesticides were banned in 1986, it was quickly discovered that alternative, integrated approaches to pest management were far more effective anyway; the government is now providing incentives to promote integrated pest management instead of over-use of pesticides.

In Botswana, the government provides agricultural subsidies for the full costs of ploughing (up to 10 hectares), together with additional subsidies for row planting and weeding; for "destumping," clearing land for cultivation; for the full cost of seeds; and for fencing. It is clear that the full-cost ploughing subsidy along with the free distribution of seed provides a very strong incentive for mixed farmers to plant an area in food crops well in excess of the expected harvested area; the ratio of harvested to planted area therefore averages less than 50 percent. The destumping subsidies also contribute to the devegetation of arable lands, but the fencing package may be more significant for grazing lands. The promotion of wire over traditional thorn fencing qualitatively and quantitatively changes the timber demands of fencing; wire fencing requires posts that can only be obtained from larger trees, while the effect of termites means that posts cut from most species require regular replacement; the result is that quality of rangeland declines through elimination of tree cover and the encouragement of bush encroachment (Perrings *et al.*, 1988).

These examples incorporate economic justifications for reducing the stock of biological resources; reducing the flow of environmental services is often an external effect of such policies. This essentially permanent drawing down of natural capital is justifiable in economic terms if it provides sustainable benefits which exceed the benefits of conserving these resources. The problem is that such incentive systems have too often led to permanent

degradation of resources rather than their enhancement, causing significant long-term economic losses to governments. Incentive schemes to boost agricultural production, for example, can contribute to problems of soil erosion, deforestation, and water scarcity. By promoting the extension of agricultural land, they can thereby deplete biological resources in natural habitats and by spreading dominant market crops, they can reduce the diversity of cultivars and so-called "minor crops."

Modifying Perverse Incentives

In the sense used here, incentives are perverse when they stimulate behavior which tends to deplete biological resources. Governments have often instituted these perverse incentives for important political or social reasons, and the impact on the environment is often an externality. Agricultural incentives, for example, are exceedingly difficult to reduce once they have been established, irrespective of how perverse they might be for biological resources.

In such cases, it may be necessary for governments to institute new conservation incentives which effectively cancel out the negative impacts of perverse incentives; in effect, governments are paying twice for something for which they would not have had to pay at all if their policies were environmentally sound in the first place.

Governments finding themselves in such an uncomfortable situation should consider the extent to which the widespread use of subsidies has led to increasingly negative sectoral and cross-sectoral impacts, especially in agriculture. Heavy subsidies are becoming a major constraint not only to the viability of the agricultural sector itself, but also to the responsiveness of the development budget as a whole, especially in a period of static or declining government revenues. On the other hand, price controls on agricultural commodities often serve as disincentives to conservation of cultivated land; easing price controls can serve as an incentive to invest scarce resources in research and development and to adopt new technologies.

While the details will vary from place to place, the dual problems of subsidies and price controls on agricultural commodities occur widely throughout the tropics. The best solution would appear to be diversified farming systems which are in tune with local ecological conditions, and which are based on locally-available resources to the maximum extent possible. Tarrant *et al.* (1987) report that in Indonesia, input subsidies, particularly for fertilizer, pesticides and irrigation are imposing considerable external costs in terms of agricultural pollution and resource depletion. They question whether a production-led approach is suitable for the diversity of avoecological systems that characterize Indonesia's marginal lands, pointing out that failure to consider farming and cropping systems as the basis for agricultural development strategies means that many traditional agro forestry and home garden systems are not being adequately developed.

More integrated agro-ecosystems or farming systems approaches would require a greater investment in research, marketing infrastructure and extension; nevertheless, this could be at least partly financed by a reallocation of funds from the removal of pesticide subsidies, a gradual removal of fertilizer subsidies, an effective system of water charges (e.g., increased taxes on irrigated lands) and the removal of credit subsidies to sugarcane.

Instead of the subsidies on cattle ranching in Amazonia, a tax levied on livestock production might reduce over-grazing, and lead to a reduction in land clearance. By reducing the rate of soil erosion, imposed forest protection would exert a beneficial influence on agricultural productivity many kilometres away. Ideally, the tax should be such that the livestock producer faces total input costs equal to the MOC of his activity, which is determined by such factors as the effects on soil erosion and consequent impact on agricultural output elsewhere in the system.

In Botswana, altering beef prices could improve land use, by changing the seasonal margins to encourage more off take in communal areas; reducing intergrade margins to encourage more offtake of lower quality grades; and raising agents' margins to encourage greater offtake. Other steps which could help correct the current system of perverse incentives could

include levying a "management fee" or range rental that varies inversely with rainfall, to reflect the inverse relation between user costs and rainfall; introducing water charges which reflect the scarcity of the resource; modifying the tax benefits available on livestock; establishing producer prices at levels that encourage an increase in offtake; and subsidizing voluntary reduction in herds in areas where range degradation has already reached severe proportions (Perrings, *et al.*, 1988).

Conclusions

Major improvements in conserving biological diversity can be made at the policy level by various government agencies through the use of economic incentives and disincentives. Such incentives at community, national, and international levels need to be included as part of a package of government policies which address issues of rural development, research, education, training, resource management, legislation, and institutional development.

Economic incentives have been used by governments to open up their frontiers to settlement or otherwise stimulate high production from biological resources. This has resulted in conversion of forests and other wilderness to a range of agricultural uses and the depletion of biological resources. While using such incentives may have been appropriate when biological resources were plentiful, the process is reaching its productive limits (and indeed has exceeded them in many places). A major step in moving from exploitation to sustainable use is for governments to analyze the impacts of all relevant policies on the status and trends of biological resources. Such an analysis would involve detailed determination of Marginal Opportunity Costs, including costs and benefits of direct and indirect values.

Based on the policy review, governments should eliminate or at least reduce policy distortions such as subsidies that favor environmentally unsound practices, and at the same time discriminate against the rural poor, reduce economic efficiency, and waste budgetary resources. Overcoming the damage caused by perverse incentives will require new incentives to promote conservation, applied at a series of levels and in a number of sectors.

Any incentives need to be designed with great care and applied in ways that will ensure that they will attain their objectives. Poorly designed incentives can easily backfire. Long-term loans, for example, may be used as incentives to deplete biological resources as well as to conserve them; a subsidy on selective logging may well discourage clear-cutting, but it may also encourage forestry activities over a larger area and thereby negate any benefits that may have been gained for biological diversity. Therefore, incentives must be designed specifically to achieve the objectives for which they are intended, and measured by that criterion.

Finally, incentives need to be protected from over-success. The incentives package for an area may be so attractive that it draws in rural people from other areas, thereby possibly negating any benefits that are gained from the incentives. Incentives therefore need to be finely tuned to the marginal opportunity cost relevant to the communities involved.

Further information on economic incentives applied to the conservation of biological diversity, along with case studies of these incentives in Thailand, Zimbabwe, Brazil, Nepal, Kenya, Mexico, China, Mali, Honduras, Japan, Kenya, the Philippines, Costa Rica, India, Zambia, the USA, Australia and Canada, can be found in McNeely (1988) <http://www.biodiv.org/default.shtml>

References

Borrini-Feyerabend, Grazia. 1996. **Collaborative Management of Protected Areas: Tailoring the Approach to the Context.** Issues in Social Policy. IUCN, Gland, Switzerland.

Borrini-Feyerabend, Grazia. 1997. **Beyond Fences: Seeking social Sustainability in Conservation.** Volume 2: A Resource Book. IUCN, Gland Switzerland.

Borrini-Feyerabend, Grazia, M. Pimbert, M.T. Farvar, A. Kothari, and Y. Renard. 2004. **Sharing Power: Learning-by-Doing in Co-Management of Natural Resources throughout the World.** IIED-IUCN, Gland, Switzerland.

Ledec, G. and R. Goodland. 1976. Epilogue in Schumann, D.A. and W.L. Partridge (eds.) **The Human Ecology of Tropical Land Settlement in Latin America.** Westview Press, Boulder, CO.

McNeely, Jeffrey A. 1988. **Economics and biological diversity: Developing and using economic incentives to conserve biological diversity.** IUCN, Gland, Switzerland

Myers, Norman and Jennifer Kent, 2001. **Perverse Subsidies: How Misused Tax Dollars Harm the Environment and the Economy.** Island Press, Washington D.C.

Perrings, Charles. *et al.*, 1988. **Economics and the Environment: A contribution to the National Conservation Strategy for Botswana.** IUCN, Gland, Switzerland

Repetto, Robert. 1987. Creating Incentives for Sustainable Forest Development. *Ambio* 16 (2-3):94-99.

Schumann, Debra A. and William L. Partridge. 1986. **The Human Ecology of Tropical Land Settlement in Latin America.** Westview Press, Boulder, CO.

Swingland, Ian. R. 2002. (ed.). **Capturing Carbon and Conserving Biodiversity: The Market Approach.** Earthscan. London, Sterling VA.

Tarrant, James, *et al.* 1987. **Natural Resources and Environmental Management in Indonesia : An Overview.** USAID, Jarkata.

Warford, J. 1987. **Environment, Growth and Development.** Economic Development Committee, World Bank, Washington D.C.