Perspective

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The Role of Convention on Biological Diversity

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Description

Bioprospecting, the systematic search for new commercial applications for biota, especially hitherto unstudied species, as a mechanism for inducing tropical biodiversity conservation by making it commercially attractive. Bioprospecting's premise is that nature contains hidden assets of potentially huge, yet unknown magnitude to humankind that can motivate and even finance biodiversity conservation in the tropics. This undiscovered genetic or biochemical information is commonly framed in the context of potential improvements in medicine or food, thus defining a massive global population of potential beneficiaries.

It is further argued that bioprospecting can affect social and economic development in developing countries by rewarding biota-rich but income-poor tropical communities that preserve and wisely manage their genetic resources. The premise of bioprospecting, coupled with the claim that practically all of humankind stands to benefit, and perhaps most especially the poorest of the poor, naturally leads to an urgent desire to conserve tropical biodiversity in order to enable discovery, extraction, and value-adding transformation of tropical biota.

Specifically, it is claimed that bioprospecting stimulates conservation through two mechanisms. First, bioprospecting firms should be willing to pay to preserve biodiversity for its innovation option value since they stand to reap direct financial benefits from any marketable discoveries. Second, conditional on an increase in life sciences firms' willingness to pay for conservation, local inhabitants' and landholders' valuation of biodiversity will change to the extent that they, as stewards over biodiverse habitats, are compensated for their contribution to bioprospecting activities. To date, most attention with respect to bioprospecting has focused on the first of these mechanisms and on resolving issues of property rights allocation prerequisite to internalizing the spillover benefits of discovering valuable information in nature.

Convention on Biological Diversity

The International Convention on Biological Diversity (CBD) is essentially a progressive Coasian solution to this problem in that it grants to low-income host nations sovereign rights over the genetic resources contained within their borders. The widespread misimpression is that all we need do is obtain the property rights to biota and their derivatives, both in situ and ex situ, effectively creating a market for biodiversity, and the rest will fall into place. The attractive intuition of such arguments is deceptive, however, and we believe the ability of bioprospecting to translate into conservation is less than its advocates claim.

This essay focuses on the likely microeconomic effects of increased demand for tropical biota, and asks the key bottom line question is bioprospecting a viable strategy for inducing endogenous conservation of tropical ecosystems, especially if conservation must be performed by local residents? In most of the low-income world, asset poverty is a primary, intractable causal factor behind biodiversity loss. When the poor depend inordinately on the consumptive use of bio assets to produce the entitlements necessary to ensure their survival from day to day, biodiverse habitats fall under constant pressure. This pressure can have devastating and widespread impacts on tropical ecosystems hosting smallholder agricultural systems. Such areas are of particular relevance to an analysis of bioprospecting as a strategy to improve locals' conservation incentives since they seem to be among the most promising and popular bioprospecting sites.

Biodiversity Conservation

Biodiversity conservation has fundamental economic drivers. Marginal forest, wet, and desert lands are converted to agricultural, industrial, and residential uses rather than left in their undeveloped state because the cost of conservation is higher than the benefits of conservation for those who control the land. The cost of conservation includes primarily the foregone discounted stream of net benefits associated with development, plus any direct costs of conservation, e.g. patrolling and maintenance. The benefits of conservation may include environmentally-conditional aid, such as the bioprospecting fees or royalties firms might pay for valuable biota or transfers from governments or NGOs tied to conservation efforts; net revenues from ecotourism, sustainable harvest or other no consumptive activities; the value of ecosystem services provided in the land's present state; psychic or spiritual dividends; as well as foregone direct conversion costs principally time spent clearing land. The value to the land user of a given parcel is often greater when developed. This is especially true when the costs of conservation equivalently, the benefits of

development are borne directly by the land users while the benefits of conservation equivalently, the costs of development, accrue more broadly, creating significant externalities. And if the conversion of some habitat shifts the cost/benefit ratio for others for example, increasing the spatial concentration of fauna that can damage crops or threaten livestock or humans or increasing decreasing the agglomeration economies accruing to either development conservation then a domino effect of sequential conversion can too easily result.

The key issue is therefore whether bioprospecting can reasonably be expected to change rural land users' incentives sufficiently to induce conservation of tropical ecosystems of any meaningful magnitude. This can be usefully reduced to two subsidiary questions. First, are firms likely to put a high enough value on bioprospecting so that new rents exist which could, in principle, be used to induce resource conservation? Second, if the necessary rents are indeed created from bioprospecting, are they likely to be distributed in such a way that local inhabitants would themselves voluntarily undertake biological resource conservation? It is posited by bioprospecting advocates that biotechnology and the prospect of discovery of macro- or micro-biota of immense worth offer an avenue to increase the valuation of nature, thereby significantly tipping the benefit-cost scales against habitat conversion and inducing local conservation efforts.

The existence of nontrivial added value from bioprospecting is merely a necessary condition to tropical biodiversity conservation. If the rents do not accrue to local land users who ultimately make conservation or conversion decisions, the debate surrounding the size of bioprospecting rents is irrelevant since the key questions ultimately surround the calculus of land and labor use in fragile ecosystems. The distributional effects depend heavily on national policies and institutional.

The need to conserve precious biodiversity is clear, especially as we begin to appreciate the magnitude of the spiritual, social and economic services it provides. But bioprospecting is an unpromising base on which to rest the economic rationale for conservation. Rather, in so far as increasing the economic value of biodiverse habitat is central to stemming conversion of marginal lands, and then we should emphasize three alternatives.