Deforestation and Forest Land Use: A Reply

William F. Hyde

In our recent article (Hyde, Amacher, and Magrath 1996), we argued that the “topic of deforestation is seldom examined from the perspective of prices and responses to resource scarcity” (p. 223). Our point was not that the market is perfect but rather that market responses limit the extent of deforestation—even in regions of attenuated property rights or open-access forest resources. The market sets this limit because as deforestation proceeds, the increasing scarcity of the resource induces rising prices, which in turn induce private investments to satisfy both commercial and subsistence household uses of forest resources. As a result, deforestation proceeds to the geographic points where the harvest and access costs associated with removing the remaining natural stock equal the costs of reforestation on land that has established and enforceable property rights. This means that a considerable area of the world’s natural forest is not endangered.

Therefore, we argued that concern for the total forest resource and its protection is misguided. It would be better to concentrate on the price increases induced by deforestation and the costs of private reforestation with an eye to identifying the level of prices and costs that will alter the boundaries of several important classes of forest land, and on concentrations of nonmarket, forest-based environmental services and public policy failures that distort market incentives.

Vincent and Gillis, in their article in this issue, feel that we err on three counts: deforestation, the magnitude of timber rent, and rent allocation. I will address these in order.

Deforestation

Vincent-Gillis suggest that we diminish the inefficiencies associated with deforestation. The source of our difference is their focus on our “Simple Model” of market
Vincent-Gillis are concerned with our argument that net market forest values are generally negative. They feel that we deny the essential economic concern with deforestation. But surely some forest lies beyond the reach of any active harvest activity. Some even lies beyond the reach of open-access activity. Surely, this is land with a negative net value in the local market. A recent report from the World Resources Institute (Bryant, Nielson, and Tangley 1997) suggests that 40 percent of the world’s forests lie beyond the reach of market activity. Table 1 (p. 230) reports estimates that are at least this large. In addition, there is a region of the world’s forest where previous harvests of the natural stock have left standing trees that are either too immature or too sparse to have positive net value. In most time periods, this land also has a negative net market value. Vincent himself was the first to my knowledge to use the term “pulse” harvests (Vincent and Binkley 1992) to identify this region.

These observations, however, do not deny the essential economic concern about deforestation. My own impression is that this concern has to do with nonmarket values (global change, biodiversity, erosion, or watershed protection), especially those attached to the remaining stock of natural forest. In examining these values, we argued that global concern for their protection should be concentrated in those higher market-value forests where nonmarket values are at risk. We find this approach preferable to wasting environmental policy on regions that are not accessible in any case and where the nonmarket environmental values are protected without policy intervention.

Vincent-Gillis state that we “implicitly assume that individuals and firms face few obstacles in converting (open-access) land” to private property (p. 134). But we explicitly discussed the problems of establishing secure tenure and cited some of the recent literature on pp. 238–39. Vincent-Gillis’s arguments and ours are similar.

Contrary to Vincent-Gillis’s claim, we did not dismiss the problems of establishing secure tenure as a market delay. The “delay” they speak of (p. 236) specifically referred to our simple model and the response by investors to rising market prices. We observed that there is no empirical evidence on the magnitude of this particular market lag. This does not mean that the lag does not exist, or that it is the only identifiable market failure, but only that the lag and its effects have not been measured successfully. As for institutional obstacles to forest investment, we discussed macroeconomic policy (p. 237), legal institutions (p. 238), spillovers from agricultural policy (p. 238), and public forestry agencies (pp. 239–40). In each case, we illustrated the problems these pose for private forestry activities, and either the incentives created for deforestation or the obstacles for reforestation. We also discussed publicly funded research, technology transfers, and research to enhance forest production and to identify improved institutional arrangements (pp. 241–42). Contrary to Vincent-Gillis’s claim, we never presume the “insignificance of policies rela-
tive to market adjustments" (p. 134). I would say that we stressed the importance of these policies in modifying market adjustments and that our conclusion specifically encouraged the assessment of their impacts on the boundaries of the various classes of forest land.

The Magnitude of Forest Rent

Vincent-Gillis are concerned that we underestimate the importance of timber rents. Because our article was about deforestation and because the concern with deforestation is comprehensive, our context is the entire global forest, while Vincent-Gillis’s context is with the share of mature natural forests where commercial timber harvests are important.

Bryant, Nielson, and Tangleley (1997) suggest that the share of mature natural forest that is subject to commercial timber harvest and that may have a positive timber rent is 28 percent of the world’s total forest. We agreed that concerns with timber rent are valid in this region (p. 238), citing the primary literature as well as examples from our own experience to illustrate that these rents can be large (p. 239). These examples raise questions about the prospective occurrence of large rents in other cases. We think that the important questions have to do with what caused the large rents to arise and whether these sources of rent are instructive for policy.

The mature natural forests that are the sources of commercial harvests and the common sources of timber rents are generally at or near the margins of previous economic harvest activity—otherwise they would have been harvested earlier. Gradual long-term price increases do give rise to rents at these locations, but they are unlikely to induce large rents before harvesting extends into these regions. Large rents must be caused by sharp market changes or by something that constrained gradual harvest expansion. The former are uncommon. The two obvious candidates for the latter are a change in infrastructure and successful enforcement of some government logging restriction, as Vincent-Gillis point out. Most of our discussion of rent was devoted to the same two sources, particularly changes in access (for example, new roads) and the particular biological formulation of the “allowable cut” harvest policy that is common in one form or another to most government forestry agencies.

These observations still “beg questions about the management activities or policies that created the rent. Does the same policy exist elsewhere? Could more rents be captured by applying the same management activity or the same change in forest policy to other timberstands . . . ?” (p. 240) And, in our context, what would be the impacts on deforestation and on incentives to reforest?

Finally, and contrary to Vincent-Gillis, we did not deny the existence of long-run stumpage price series. Rather we noted that these data are “not reliable” for purposes of prediction (p. 231). They are unreliable because stumpage value is the residual left
after all harvest, transport, and processing costs are deducted. This residual varies greatly, even within a region and often within a harvest site, according to differences in wood quality and location, and on-site harvest difficulties. Therefore, stumpage values from one time or place are not good predictors of stumpage values at another time or place, and composite stumpage price series from one time are not good predictors of composite stumpage prices in another time. This is one reason why Barnett and Morse (1963) used lumber prices, not stumpage prices, in their classic analysis of intertemporal trends in resource prices in the United States.¹

Rent Allocation

Vincent-Gillis believe that we minimize the importance of rent allocation, and that we imply they believe three things are always true. We would never say someone else “always” believes anything. To clarify any possible misunderstanding I would restate our sentence (p. 239) to read as follows: “Vincent-Gillis have emphasized cases of large timber rent, and they have been concerned with claiming a larger share of this rent for the government. Vincent has also argued that rent allocation has an effect on efficient output levels.” I think the articles Vincent-Gillis cite in their comment support this revised statement. Nevertheless, the restatement does not alter our point that all discussions of timber rent should lead to questions about the further occurrences of these rents, the policies that give rise to them, and the application of similar policies in other timberstands and forests.

As for the merit of rent capture by public agencies, the difference between Vincent-Gillis’s position and ours is that we believe that allocation is a distributive matter of undetermined merit. That is, it is an empirical question that must be judged by the performance of the government agency or forest concessionaires receiving the rent in each particular case. We have a preference for the most socially productive use of the rent—rather than for a favored agent.²

Of course, policy can modify and even destroy rents, as Vincent-Gillis argue and we agree. Administrative behavior can also modify or destroy rent. We all know of government agencies as well as private operations that dissipate rents with poor decisions, just as we know of those that collect and reinvest rents in ways that improve the general welfare.³ This is what makes the preferred allocation a distributive issue whose resolution depends on the performance of the agents involved.

In conclusion, our concern was with global deforestation, whether due to commercial forestry, agricultural land conversion, or subsistence household uses of the forest. Our primary argument was that broad-based forest policy interventions designed as general protection against world deforestation are not well advised because specific markets for the various products and services of the forest already exist. These specialized markets divide forests into at least three distinct land use
classes: sustainable private forests and forested commons; unsustainable open-access forests near the frontier; and an unused residual forest. Forest policy will affect each of these land categories differently. Therefore, it would be better to address the market and policy failures that shift the boundaries of one or another of these classes of land use, and to anticipate that most policies will selectively affect some, but not all, of these boundaries. I think our original article was clear on these points.

Notes

William F. Hyde is professor in the Forestry Department at Virginia Polytechnic and State University, Blacksburg, Virginia.

1. Smith (1979) raised doubt about the statistical reliability of many primary resource prices for prediction. Jung, Krutilla, and Boyd (forthcoming) demonstrate the unreliability of composite stumpage price series.

2. Contrary to Vincent-Gillis, allocation does not alter the efficient level of production in our figure 1. Also contrary to Vincent-Gillis, rents are not low because of the way we drew the rent gradient. The forest rent gradient almost always starts below the agricultural land value gradient and extends to its right. Forest rents are low because forests are lower-valued uses of the land. A steeper gradient in our figure 1 would not alter these basic points.

3. Repetto and Gillis (1988), who are cited by Vincent-Gillis, give many examples of government actions that dissipated timber rents or government agencies that did not have the administrative ability to capture some rents. These examples would seem to urge caution on any view that government is a generally preferred collector of rents.

References


