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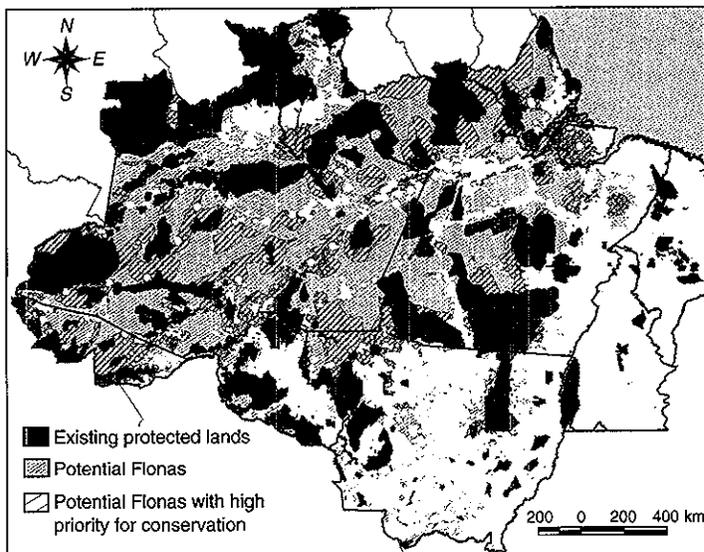
Brazil, with its vast natural resources and a great need for economic development, is a prime example of the conservation-versus-development dichotomy. In an attempt to reconcile this issue, the Brazilian government is planning to balance its Amazonian development plans (1) with a new forest policy based on well-managed timber production, implemented within a greatly expanded system of National Forests (Flonas) (2). By 2010, 50 million hectares of new Flonas will be created, an area the size of Spain. The scale of this initiative is equivalent to the 1908 establishment of the U.S. National Forest system and is unprecedented in the tropics.

Without incentives for sustainably managed production, the timber industry will continue to sweep through the Amazon, catalyzing forest destruction, unplanned development, and the industry's own demise (2). With proper management, the negative impacts and cutting cycles of logging can be substantially reduced and the profitability of sustainable logging operations increased (3). Managed timberland area rose from almost nothing in 1993 to more than a million hectares in 2001 (4), with more than 0.3 million hectares certified by the international Forest Stewardship Council (FSC).

Although often underfunded and understaffed, protected areas in tropical countries are surprisingly effective in reducing deforestation and other forms of degradation (5). Flonas are sustainable-use conservation units, whose purpose is to produce goods (timber and nontimber products) while maintaining environmental services. Brazil's Flona system will complement its other protected lands and enhance conservation of Amazonian biodiversity. The mosaic of conservation areas,

combining Flonas with fully protected parks and biological reserves, will provide corridors that allow movement between core protection areas, enhancing the conservation potential of the entire system of protected lands.

Federal- and state-controlled Flonas provide for practical, long-term management of



Forest Resources in Brazil. Forests in the Brazilian Amazon that could be designated as Flonas without conflict with existing conservation lands or human inhabitants (2).

Amazonian forests, a better option than reliance on numerous, uncertain, and corruption-prone frontier governments for stewardship (6). Strategically planned expansion of the Flona system may further contribute to biodiversity conservation and economic stability in the Amazon by constraining predatory activities, limiting land availability, increasing land values, and encouraging land use intensification. This would reduce the negative impacts of programs like *Avança Brasil* (1).

Spatial correlation of critical conservation habitat and valuable economic resources seem to make conflicts inevitable. However, there is complementary potential in policy based on sustainable forest use and biodiversity conservation. New Flonas are currently being sited by both national (7) and state (8) governments using a comprehensive methodology (2) that incorporates environmental and socioeconomic factors into the decision-making process, so that new conservation lands maximize productive capacity and conservation value, while minimizing social conflicts. This makes the

establishment of new conservation units, including up to 70 million hectares of Flonas, physically and politically feasible. Similar methods could be used to resolve complex land-use problems around the world. Establishment of the new Flonas, on public lands, will cost approximately \$1.4 per hectare, or roughly \$70 million for the planned 50 million hectare expansion (9).

Brazil can either manage its vast natural resources or repeat the all too familiar boom-and-bust process of logging operations (10). Establishing sufficient sustainable-production forests for long-term tropical timber extraction is the critical first step. Implementation of long-term sustainable production will require concurrent development of sufficient human resources to enforce and monitor existing forest regulations. In addition, it is essential that the Brazilian government continue its commitment to the goals of sustainable production in terms of allocated resources and supplemental policies.

Global conservation goals call for the protection of 10 to 12% of the world's tropical forests. Establishment of the legislated Flonas will protect 15% of the Brazilian Amazon from deforestation. Combining this with Brazil's existing conservation lands (28%), and the federal government's goal of providing full protection to 10% of the Amazon, will easily put Brazil among the foremost conservers of natural resources in the world.

Brazil's actions may prove influential among many developing countries, particularly Amazonian countries such as Bolivia, Peru, and Venezuela, that are facing similar issues.

References and Notes

1. W. F. Laurance et al., *Science* **291**, 438 (2001).
2. A. Veríssimo et al., *Conserv. Ecol.* **6**, 4 (2002); available at www.conseco.org/vol6/iss1/art4
3. P. Barreto et al., *For. Ecol. Manag.* **108**, 9 (1998).
4. Based on interviews in 2001 with major timber companies in Pará, Mato Grosso, and Rondônia, where 95% of timber production occurs.
5. A. G. Bruner et al., *Science* **291**, 125 (2001).
6. D. Nepstad et al., *Science* **295**, 630 (2002).
7. A. Veríssimo, C. Souza Jr. *Identificação de áreas com potencial para a criação de Florestas Nacionais na Amazônia Legal* (Ministério do Meio Ambiente, Brasília, 2000), 56 pp.
8. A. Veríssimo, C. Souza Jr., R. Salomão, *Identificação de áreas para a criação de Florestas Estaduais no Estado do Acre* (Governo do Acre, Rio Branco, Brazil, 2001), 25 pp.
9. Supplementary material is available on Science Online at www.sciencemag.org/cgi/content/full/1072807/DC1
10. J. R. Vincent, *Science* **256**, 1651 (1992).
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