Forests or fields?

A response to the theory that tropical forest conservation poses a threat to the poor

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The theory that tropical forest conservation poses a threat to the poor is put forward in David Wood's article, 'Forests to fields: restoring tropical lands to agriculture', published in this issue of *Land Use Policy*. Wood proposes to open to deforestation almost all of the tropical forests that are still standing. Conversion to non-forest uses would be promoted through increased flows of international funds with fewer provisions regarding sustainability and environmental protection than such projects currently have. These proposals are unwise and dangerous.

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I thank A. Chauvel, P.M.L.A. Graça and C. Housel for comments on the manuscript.

Wood's justification for allowing deforestation rests heavily on the history of shifting cultivation practised by tribal groups in most tropical forest areas at some time before they came into contact with Europeans. He betrays a lack of understanding of the arguments for tropical forest conservation, which do not depend on forests having been forever 'pristine'. Wood also greatly exaggerates the capacity of tropical forests to recover from deforestation, as well as the prospects for agricultural sustainability in deforested land. Sacrificing the remaining forests would do nothing to address the underlying causes of poverty in developing countries. Dividing the resource pie more equitably, and recognizing carrying-capacity limits, would only be briefly postponed by the proposed sacrifice. By destroying tropical forests, Wood's proposal would destroy one of the most valuable potential resources for sustaining local populations in tropical forest areas: the environmental services of the forests.

The attack on conservationists

David Wood proposes that present and planned protected areas in tropical forest areas be drastically reduced to allow deforestation for expansion of agriculture.[1] He alludes to the 'threat' to developing countries posed by the 'conservationist lobby' made up of 'transnational conservation bodies' with 'multimillion dollar budgets'. The World Bank is portrayed as dangerously influenced by 'pressure' from conservationists, whose allegedly unreasonable demands are hindering development to feed the masses in the Third World. This does not sound like the same World Bank that I know, where environmental concerns have very little influence and where the vast majority of funding is definitely not going either to feed the poor or to protect the environment.[2] Wood even argues that 'a substantial part of the funds now spent on tropical forest conservation should be allocated to agricultural development'.

'Environmentalist groups and scientists' are accused of advancing 'conservationist objectives' based on arguments that tropical forests are

[1]D. Wood, 'Forests to fields: restoring tropical lands to agriculture', *Land Use Policy*, this issue, pp 91–107.
[2]For a review of the Bank's recent record in these areas, see B. Rich, 'Multilateral development banks and tropical deforestation', in S. Head and R. Heinzman, eds, *Lessons of the Rainforest*, Sierra Club Books, San Francisco, CA, 1990, pp 118–130.

0264-8377/93/020108-14

pristine, in the sense of never having been disturbed by humans, and that deforestation is irreversible on any time-scale. On the contrary, the arguments for maintaining a substantial part of the remaining tropical forests uncleared are both valid and compelling; they do not depend on forest being 'pristine' or on deforestation being forever 'irreversible'. Ironically, it is the same scientists that Wood attacks who have progressively brought to light information on prehistoric disturbances in tropical forest areas.

Wood's suggestion that underestimation of the extent of prehistoric clearing in tropical forests is a deliberate deception perpetrated by 'conservationists, who have some interest in establishing that present tropical forest is "natural"', is unfounded. In fact, I may have been the first to use any sort of systematic soil survey to show that charcoal is present in soils under Brazil's 'virgin' forest over substantial continuous areas.[3] This pattern has since been found repeatedly, including studies near Manaus and in Colombia and Venezuela.[4] In the Manaus area I have found charcoal throughout the reserve system of the INPA/Smithsonian Institution 'Minimum Critical Size of Ecosystems' project as well as in other INPA reserves, and have dated samples at 675 and 1080 years before present.[5] Better knowledge of the extent of anthropogenic black soils in Amazonia also points to widespread human occupation.[6] It is not true that 'the credibility of tropical forest conservation programmes will be in doubt until we have more reliable information on past use of forested lands', as this is not the basis of arguments for avoiding deforestation. A previous history of clearing does not render deforestation 'environmentally benign', as Wood puts it.[7]

The scenario for unfettered deforestation

Wood's article proposes opening virtually all tropical forest to deforestation for agriculture, allowing any forest previously cleared by humans to be converted to agriculture, and shifting the 'burden of proof' to 'conservationists' to demonstrate lack of any history of previous use. The basic premise is that any previous clearing, even if thousands of years in the past, invalidates the arguments in favour of established reserves. Only a few remnants of different vegetation types (including the majority that have been disturbed at some time in the past) need be maintained for a future role as sources of wild organisms in order to recolonize an agricultural landscape that has been temporarily 'borrowed' from the forest. According to Wood's scenario, this land would no longer be needed once human population naturally stabilizes and increases the intensity of its use of cleared land, so as to be satisfied with the off-take from a smaller area.

In the first place, it should be made clear that Wood's scenario for the future stabilization and retraction of agricultural demand for land is totally unrealistic. Among its unfounded premises is the implicit assumption that land is only or mainly used for producing food for subsistence – a commodity with a limited demand that is constrained by the size of people's stomachs. In fact, most deforestation in the tropics is being done for other reasons.

Brazil, it should be remembered, has by far the largest area of remaining tropical moist forest, and the importance of events here can be expected to increase even more as the forests of other tropical

[3]P.M. Fearnside, *Estimation of Carrying Capacity for Human Populations in a Part of the Transamazon Highway Colonization Area of Brazil*, PhD dissertation in biological sciences, University of Michigan, University Microfilms International, Ann Arbor, MI, 1978.

[4]F. Basseri and P. Becker, 'Charcoal's occurrence in soil depends on topography in terra firme forest near Manaus, Brazil', *Biotropica*, Vol 22, 1990, pp 420–422; R.L. Sanford Jr, J. Saldarriaga, K.E. Clark, C. Uhl and R. Herrera, 'Amazon rain-forest fires', *Science*, Vol 227, 1985, pp 53–55; J.C. Saldarriaga, D.C. West and M.L. Tharp, *Forest Succession in the Upper Rio Negro of Colombia and Venezuela*, Oak Ridge National Laboratory, Environmental Sciences Publication No 2694, ORNL/TM-9712, National Technical Information Service, Springfield, VA, 1986.

[5]T.E. Lovejoy and R.O. Bierregaard, Jr, 'Central Amazonian forests and the Minimum Critical Size of Ecosystems Project', in A.H. Gentry, ed, *Four Neotropical Rainforests*, Yale University Press, New Haven, CT, 1990, pp 60–71.

[6]N.J.H. Smith, 'Anthrosols and human carrying capacity in Amazonia', *Annals of the Association of American Geographers*, Vol 70, 1980, pp 553–566.

[7]For a review of the environmental impacts of deforestation see P.M. Fearnside, 'An ecological analysis of predominant land uses in the Brazilian Amazon', *The Environmentalist*, Vol 8, 1988, pp 281–300.

countries continue to succumb to deforestation. In Brazilian Amazonia, most deforestation is for low-productivity cattle pasture, much of which is planted as a means of securing land claims that produce profits through land speculation and other activities not related to beef production.[8] Wood's frequent references to 'farms', 'farmers' and 'agriculture' conjure up bucolic images of an agrarian society and landscape that are far from the realities of Amazonia. As of 1985, when Brazil's last agricultural census was carried out, 62% of all private land in the Amazon region was in ranches over 1000 ha in area, while only 11% was in properties less than 100 ha in area.[9] Even in those smaller properties most deforested land sooner or later ends up as degraded pasture.

In 1991 approximately 70% of the deforestation activity took place on large ranches (over 1000 ha) and medium ranches (100–1000 ha), while only 30% was in properties less than 100 ha in area.[10] In 1991 the rate of deforestation was 11 100 km^2 a year (in the portion of the region considered to be originally forested, and so excluding the *cerrado* or Central Brazilian scrubland included in a number of estimates made prior to 1989). This rate is half the comparable average rate that prevailed from 1978 to 1988 – the proportion cleared by large ranchers would be even higher in 'normal' times when Brazil's perennial economic recession is less severe. The reduction in clearing rates between 1987 and 1991 can be attributed largely to the deepening economic recession that left ranchers without money to invest in clearing at the rates that prevailed in the past. Subsistence clearing using family labour is relatively immune to the vagaries of the business cycle; the substantial reduction in deforestation rate reflects the vast majority of Brazil's Amazonian clearing that has nothing to do with feeding the poor.

The need to increase food production

Population growth is seen by Wood as completely unimpeded – an independent variable to which land use will have to adapt. The distribution of income and of access to land are also tacitly assumed to be immutable. Societal changes can make substantial differences in the numbers of people that can be fed: most of the world's hungry cannot feed themselves because they have no money, even though the countries in which they live may have surpluses for export.[11] However, under any social system, the population must ultimately conform to the land's capacity to support it. No recognition is given to the interaction between these factors. Equilibrium can be reached with or without any forests left, and there are strong reasons for every country to chart a course of development that provides for maintaining substantial areas in forest. I would argue that it should not be taboo to think about either population or income distribution as factors subject to human planning – people have to decide the future scenario that they wish to aim for and adopt the policies (including population policies) that will achieve their goals. Feeding the maximum possible number of people should not be, and in fact is not, the goal of any country.

In discussing the equilibrium between population and resources, I hasten to point out that the levels of land intensification and farming technology are not stationary. A long-standing academic debate surrounds the question of whether population increase leads to intensification or vice versa,[12] or whether, as is more likely the rule, a simul-

[8]P.M. Fearnside, 'Causes of deforestation in the Brazilian Amazon', in R.F. Dickinson, ed, *The Geophysiology of Amazonia: Vegetation and Climate Interactions*, John Wiley & Sons, New York, 1987, pp 37–53; P.M. Fearnside, 'A prescription for slowing deforestation in Amazonia', *Environment*, Vol 31, 1989, pp 16–20, 39–40; P.M. Fearnside, 'Deforestation in the Amazon', *Environment*, Vol 31, 1989, pp 4–5.

[9]Brazil, Presidência da República, Instituto Brasileiro de Geografia e Estatistica (IBGE), *Anuário Estatistico do Brasil 1989*, Vol 49, IBGE, Rio de Janeiro, Brazil, 1989.

[10]P.M. Fearnside, 'Deforestation in Amazonia: the effect of population and land tenure', forthcoming.

[11]S. George, *How the Other Half Dies: The Real Reasons for World Hunger*, Rowman & Allanheld, Totowa, NJ, 1977; F.M. Lappé and J. Collins, *World Hunger: 10 Myths*, Institute for Food and Development Policy, San Francisco, CA, 1982; F.M. Lappé, J. Collins and C. Fowler, *Food First: Beyond the Myth of Food Scarcity*, Ballantine Books, New York, 1979.

[12]E. Boserup, *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*, Aldine, Chicago, IL, 1965; C. Geertz, *Agricultural Involution: The Process of Ecological Change in Indonesia*, University of California Press, Berkeley, CA, 1963.