REVIEW OF:
THE FRAGILE TROPICS OF LATIN AMERICA: SUSTAINABLE MANAGEMENT OF CHANGING ENVIRONMENTS. Edited by Toshie Nishizawa and Juha I. Uitto. (United Nations University Press, Tokyo, 1995). 325 pp. (ISBN 92-808-0877-X).

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This volume contains 13 papers (plus an introduction by the editors) presenting the results of a symposium held in 1990 at the University of Tsukuba, Japan. The volume covers a wide range of topics and geographical areas, covering the Amazonian portions of Brazil and Peru and the semi-arid northeastern region of Brazil, plus one paper dealing with tropical Latin America as a whole. The individual papers contain a great deal of useful information, although there will probably be few readers with sufficiently broad interests to want to read the book from cover to cover.

The volume begins with a paper by Gilberto Gallopín and Manuel Winograd presenting results of computer simulations of the 'ecological prospective' for the Latin American tropics. They generate 'pessimistic' and 'optimistic' reference scenarios (both indicating severe problems), plus a 'sustainable scenario' based on a series of assumptions taken from the UN Food and Agriculture Organization/International Institute of Applied Systems Analysis (FAO/IIASA) 'Agro-Ecological Zoning' project of the early 1980s. Although the authors present the 'sustainable scenario' as realistically achievable, this reviewer (a long-time critic of the FAO/IIASA study on which it is based) can't resist the temptation to point out the dream-world nature of its basic assumptions. Crop yields are assumed to increase exponentially at 1.5-2.0%/year (p. 27), an assumption that, combined with large-scale expansion of the area cropped and population growth falling to 1.2%/year in 2030, naturally leads to a rosy situation. Perhaps more important is the belief that tropical ranching might double or almost triple in yield over the region as a whole, and that the response of ranchers would be to the halt further clearing and to convert 30% of their pasture land into more sustainable uses (p. 38). One problem with this argument is the extrapolation of results obtained on small areas (where dramatic increases are undeniably possible if fertilizers and other inputs are applied) to the vast expanses of pasture in Amazonia for which supplying inputs (especially phosphorus) would not be possible. Another problem is that ranchers, like most people everywhere, would be unlikely to be satisfied with their current income were the assumed yield increases to materialize, and would probably respond by cutting more forest to further expand the successful ranching system.

Emilio Moran contributes a paper contrasting rich and poor ecosystems in Amazonia--and the varied agricultural prospects on the great range of quality of the soils that underlie them. His views on what should be done with the best soils in the region will not be shared by many. He believes that it "makes no sense" to put these soils "into production of .... tree crops (a was the

case in Rondônia with cacao)" (p. 62). His recommendation is to convert these areas to intensive annual cropping with "the government providing the conditions for access to fertilizers at competitive prices" (p. 62).

Betty Meggers contributes an archaeological perspective on Amazonian settlement, documenting ways that prehistoric peoples adapted to Amazonian environments. The four major climatic oscillations that have shaken the region since the Pleistocene coincide with abrupt cultural replacements in archaeological sequences. Meggers warns of the potentially devastating impact on the biosphere of human activities such as deforestation and human-induced climatic changes.

Minora Tanaka, Akio Tsuchiyo and Toshi Nishizawa analyze the distribution and interannual variability of rainfall in Brazil. The study links recurrent droughts in the Northeast to sea surface temperature and to the strength of the inter-tropical convergence zone (ITCZ).

Hilgard O'Reilly Sternberg covers a wide range of topics related to Amazonian wetlands, including a review of the controversies surrounding the possible influence of deforestation on the flooding regime of the Amazon and its tributaries (pp. 130-131). He warns of potentially grave impacts from oil spills as petroleum exploitation expands in the region (p. 136).

Roberto Motta contributes a sociological study of entrepreneurs and state bureaucracies in Manaus. He concludes that, "considering the history of Amazonia since the intrusion of the Europeans, the Free Trade Zone of Manaus is perhaps not the worst of its many evils" (p. 195).

Mario Hiraoka presents the fishing and hunting activities of floodplain inhabitants (ribereños) in Amazonian Peru. Myths, taboos and folklore, most of which is derived from indigenous cultures, are key elements in maintaining ecological balance in the floodplain.

Christine Padoch and Wil de Jong examine agroforestry in indigenous and ribereño (non-indigenous) populations in Peruvian Amazonia. They conclude that market-oriented non-indigenous agroforestry systems near urban centers are more likely than indigenous ones to provide models for promotion on a wider scale.

Miguel Pinedo-Vasquez, Daniel Zarin and Peter Jipp provide details of forest management by ribereños in Peru. They stress that "sustainable use of the resources within a communal reserve will require not only local knowledge but also some technical input from outside the community" (pp. 247-248).

A series of papers on northeastern Brazil provides

information on the characteristics that limit sustenance of humans and other species in the region. Eiji Matsumoto looks at the caatinga (dry deciduous) vegetation and how drought affects its growth rate. Toshie Nishizawa, Akio Tsuchiya and Maria M.V. Pinto survey the characteristics and utilization of tree species. These authors also relate growth rate to water deficit and storage for a variety of species and calculate the demands that wood harvest for charcoal and for firewood used by bakeries is placing on caatinga forest. Finally, Iaso Saito and Noritaka Yagasaki present the changes brought by irrigation. In addition to obvious benefits, "plant diseases have started to appear and soil productivity has begun to decline" (p. 321). Among the agronomic problems is salinization of the soil (p. 321). Concentration of land holdings (p. 322) also promises to exacerbate social problems.

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