Geographic Research on Aboriginal and Peasant Cultures in Amazonia, 1980-1990

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ABSTRACT
Geographic research in the 1980s on aboriginal and peasant cultures in Amazonia has focused on Indian subsistence, peasant riverine villagers, and frontier settlement. Themes examined include prehistoric agriculture and demography, protein scarcity, crop diversity, swidden-fallow management, floodplain cultivation, colonization, forest extraction, fishing, cattle ranching, deforestation and soil decline. Most work on these topics has been done by other social scientists and ecologists, but geographers have made significant contributions, including some influential articles and a dozen books. Active participation, through research and publication, in the international concern over the destruction of the Amazon environment, however, has been less than we might expect from geographers.

INTRODUCTION

Only a handful of geographers have been undertaking research on traditional Indian and peasant societies in Amazonia. However, there has been an increase in the 1980s, and the total volume and diversity of topics have been impressive. Much of the work is widely cited outside of geography. Here we will review research on aboriginal agriculture, settlement and demography; peasant riverine settlers; and frontier colonization and associated environmental impact. In the 1980s research on all these topics has increased more in disciplines other than Geography. The emphasis here, however, is on the published research by geographers, particularly North Americans and Europeans. There has been little work by geographers from Latin America on the cultural geography of Amazonia. For an up-to-date, broader treatment of the literature see Eden (1990).

NATIVE CULTURES

Prehistoric Agriculture

Geographers have made significant contributions to the study of prehistoric agriculture in the Andes and in Mexico, but less so in Amazonia where fields survive only in the wet savannas. Denevan's 1966 monograph on the raised fields of the Llanos de Mojos of Bolivia was republished in revised form in Spanish (Denevan 1980c). He also prepared a typology of prehistoric New World agricultural fields and field features, several of which occurred in Amazonia (Denevan 1980b; 1982a). Research on crop remains in early sites by archaeologist Anna Roosevelt (1980, 1989a, 1989b) indicates a probable maize staple in the *várzea* (floodplains) in late prehistoric times, rather than manioc.

Prehistoric Settlement

Geographers Nigel Smith (1980) and Michael Eden (Eden *et al.* 1984) have done surveys of the *terra preta* soils of the lower Amazon and the Río Caquetá of Colombia. These are black soils with heavy concentrations of

shards and other refuse that are indicative of former settlements, often of considerable duration and extent, some over 100 *hectares*. Roosevelt's (1989b, 1991; also see Gibbons 1990) recent surveys on Marajó revealed settlements of up to 40 large mounds each, each mound covering up to 50 acres and up to 65 feet high, with up to 10,000 people in **[end p. 117]** each village. Habitation sites extend "almost continuously" along the Amazon near Santarém. Archaeologist Betty Meggers (Meggers, *et al.* 1988), however, argues that these large sites were made so by repeated reoccupation, not by individual villages.

Aboriginal Demography

Based on estimates of average densities for the major Amazon habitats, Denevan in 1976 calculated an aboriginal (sixteenth century) population for Greater Amazonia of 5.1 to 6.8 million, touching off considerable debate. Some scholars have argued that his estimates are too high (Meggers for the floodplains, in Roberts 1989; Hemming 1978, 490-492, for the Brazilian Amazon); others that they are about right (Dean 1985, for the Tupinambá; Frank 1987, for the *terra firme* (interfluve) forests); and others that they are too low (Morey 1979, for the Orinoco Llanos; Myers 1990, for the Upper Amazon). Myers believes there may have been five million for the Upper Amazon alone. Roosevelt (1989b) suggests 100,000 to 200,000 for just Marajó Island. Meggers (Roberts 1989), however, believes that the contact densities of both the *várzea* and *terra firme* averaged no more than 0.3 per km^2, reflecting an unreliable floodplain habitat due to unpredictable rise and fall of water levels and apparently large uninhabited areas. Consequently, she does not find early eye-witness accounts of dense riverine populations credible. However, greater densities, both Indian and peasant, practicing traditional agriculture, exist today along large stretches of the floodplains. Meggers' conservative 0.3 per km^2 overall density still converts to nearly three million Indians for Greater Amazonia. The debate is not just of academic interest, as aboriginal numbers are indicative of the degree of successful adaptations by Indians to the Amazon environment and hence whether or not they are viable models for development today.

The decline of the Amazon Indians is brilliantly chronicled by David Hemming in *Red Gold* (1978) and *Amazon Frontier* (1987), the most outstanding historical geographies of Amazonia to date.

Ethnoecology

The topic of Amazon Indian studies that received the greatest attention from geographers in the 1980s is that of ethnoecology. Particularly notable and frequently cited is the volume by Roland Bergman, *Amazon Economics* (1980, 1990), a study of time inputs in Shipibo subsistence in eastern Peru. Martha Works (1985; also see 1987) wrote a dissertation on agricultural change among the Aguaruna of Peru. A two year project involving geographers, anthropologists, agronomists, and botanists studied the Bora of Peru (Denevan, *et al.* 1984; Denevan/Padoch 1988; Treacy 1982). The focus was on swidden-fallow management to increase the proportion of useful plants in the fallow. Another interdisciplinary project involving geographer Susanna Hecht and anthropologist Darrell Posey examined Kayapó (Brazil) soil management, finding sophisticated techniques of fertility enhancement (Hecht and Posey 1989; Hecht 1989, 1990).

Paul Blank (1981) produced an interesting but little known article on the Macusi Indians of northern Brazil, based on Master's field work, in which he demonstrated the importance of protein rich maize in Amazon diets during high water periods when fish sources of protein are low, in contrast to low water periods when protein poor manioc is the staple and protein is mainly supplied by fishing. Another innovative study is that by McGrath (1987) on "The Role of Biomass in Shifting Cultivation." Using mostly Amazon examples, he shows that supposedly energy efficient shifting cultivation is far from that if the energy contribution of the burned forest biomass is included in input-output calculations.

Other studies of Amazon Indian subsistence by cultural geographers include Smole (1989) on the

Yanomamo, a summary of earlier research; Scott (1987) on the Campa of Peru; and Parker on two Indian and two *caboclo* groups in Brazil (Parker, *et al.* 1983). Eden has examined Andoke and Witoto shifting cultivation in Colombia (Eden/Andrade 1987), and has used remote sensing to measure Wapisiana swidden impact on the forest (Eden 1986). In another innovative study he examines the degree of crop diversity for tribes in Colombia and New Guinea and finds that low diversity systems can be as ecologically viable as polycultural systems (Eden 1988; also see Beckerman 1983).

Research by anthropologists on aboriginal subsistence in the 1980s was much greater than that by geographers, reflecting the importance of cultural ecology in anthropology and also the stimulation of several theoretical issues based on Amazon data (see below). Three edited volumes of papers published in the 1980s are indicative of this effort: *Adaptive Responses of Native Amazonians* (Hames/Vickers 1983), *Does the Swidden Ape* ***[end p. 118]*** *the Jungle?* (Beckerman 1983), and *Resource Management in Amazonia* (Posey and Balée, 1989). See Sponsel (1986) for a review of anthropological research in Amazonia.

The Protein Thesis

There is a dramatic differentiation, currently as well as in the past, between the floodplains and the interfluve forests, in terms of Indian population density, settlement size and stability, productivity and cultural complexity. This pattern, which is consistent throughout Greater Amazonia, has generated considerable theory and debate, and much of the cultural ecological research of the 1970s and the 1980s is related. Explanations involve impoverished soils of the *terra firme*, depopulation, warfare, and protein scarcity (limited game) in the *terra firme* compared with the *várzea*, given a protein poor crop staple of manioc (Chagnon/Hames 1980; Sponsel 1983). The protein thesis was essentially expressed by Sauer in *Agricultural Origins and Dispersals* in 1952 and also by Denevan in 1966 but was brought to wide attention by anthropologists Donald Lathrap, Robert Carneiro, and Daniel Gross (see Denevan 1976, 1984b). Other ethnographers have argued that there is little evidence of protein scarcity (e.g. Beckerman 1979; Chagnon/Hames 1980). Despite criticism, the concept received renewed support in the 1980s, including from German geographer Erwin Frank (1987) and anthropologists Baksh (1985) and Good (1987). As yet, no other explanation accounts for the consistently very low densities of *terra firme* Indian populations today. However, in earlier times a more important factor may have been the stone axe, which takes as much as 30 times more time to clear mature hardwood forest as does the metal axe, thus making shifting cultivation a very difficult enterprise (Denevan 1991-92).

CABOCLOS AND *RIBEREÑOS*

Background

Significant advances have been made in furthering our knowledge of Amazonian peasants during the past decade. In addition to the studies of recently-arrived farmers associated with highway and development projects on the interfluves, the new focus has been on the riverine inhabitants. Known as *caboclos* in Brazil and *ribereños* in Peru, the riparian residents consist of detribalized Amerindians, offspring of Amerindian-European unions, and descendants of early immigrants with varied ethnic and national origins. Prior to the large scale arrival of settlers after 1950, the *caboclos/ribereños* constituted the dominant population group of Amazonia. In spite of their ubiquitousness and their extended occupation of the fluviatile region, they remained virtually invisible to the scientific community and government agencies. This resulted from their dispersal over a large territory, marginal participation in the market economy, absence of political and economic groups to represent their needs at the regional and national levels, and their non-exotic lifestyles.

The first comprehensive essays on the *caboclos/ribereños* were provided by Wagley (1953) and Sternberg (1956). The classical study of a *caboclo* community is Wagley's book on Gurupá near the Amazonian estuary. The

pioneering work by a geographer is Sternberg's study of Careiro, a floodplain island village near Manaus. He focused on the land use changes that accompany population growth and increasing market opportunities. These early studies opened the way to the exciting life of the river people. However, for the next two decades, as geographers became enthralled with pan-Amazonian colonization activities, only scant attention was given to riparian peasants.

The large scale environmental changes brought by accelerated mining, hydroelectric dams, highway construction, cattle ranching, and family farming projects, coupled with world-wide concerns about the loss of biodiversity and climate changes, have served to redirect our focus toward traditional resource management systems (Denevan 1980a). Amerindians' ecological familiarity and their resource utilization practices have been viewed by many as alternatives to current destructive practices.

The same logic has been applied to riverine peasants. Their detailed knowledge of the local environment and its management, mostly based on aboriginal patterns, is believed to contribute toward devising sustainable land use strategies. Furthermore, the *caboclo/ribereño* knowledge is especially useful, since these people are in varying degrees integrated with the dominant Ibero-American societies and economies. Their information is also of easier access than that from their aboriginal counterparts.

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Recent Studies

The *caboclos/ribereños* have been scrutinized from several viewpoints. The origin and history of *caboclos* as a distinct peasant group are discussed by Parker (1981, 1985b, 1989). The nature of colonial political control and economy were largely responsible for the "peasantization" of the Indians. The practice of gathering diverse tribal groups into missions run by various Catholic orders along the Amazon and its main tributaries was a factor. The scarcity of labor for collecting a variety of forest products, especially by individuals with detailed knowledge of forest ecology, led colonial authorities and settlers to compete for the control of non-missionized natives. The cultural contact and biological mixing that began in the early seventeenth century served as additional factors for the emergence of a new Amazonian class.

The rubber boom of 1870-1920 contributed to increase, diversify and disperse the *caboclo* and *ribereño* population. New migrants came in search of better economic opportunities from the regions surrounding the basin and intermarried with the locals. In the process, a distinctive cultural group emerged, sharing both Amazonian and European cultural traits. The expanded population became integrated with the capitalist economy through the sale of forest and farm products on one hand and purchase of basic manufactured goods on the other. McGrath (1989) offers a partial understanding of trade relations and networks established between these peasants and the major service and regional manufacturing centers.

The river people base their subsistence on a combination of farming, fishing, hunting and extraction of forest products. The farming systems of Amazonia are divided into two broad groups. On the *várzea*, agriculture has to take into account the annual inundations and the diverse micro-terrain variations resulting from slight changes in relief, drainage and soil characteristics. Denevan (1984a), found that floodplain farmers adopt a zonation principle analogous to that of Andean peasants. Crops and crop complexes are adjusted to each floodplain biotope, so that successful food production for subsistence and sale depends on the skillful integration of several biotopes. The principles suggested by Denevan are corroborated by information collected by Hiraoka (1985a, 1985b, 1985c) in the floodplains of the Peruvian Amazon. Farmers near Iquitos and other major urban centers have been applying such practices to supply their households and markets with food. In recent years, however, with increasing market demands and government subsidies, the traditional system is being simplified. Cash crops like rice and jute are taking a proportionately larger share of

the peasants' land and labor (Hiraoka 1989a, 1989b). Simplification of land uses is effecting a number of changes, including rural migrations, disparity in access to land and wealth and environmental alterations (Hiraoka 1985c).

We now have a better understanding of the structure and mechanisms of tropical forest farming on the interfluves. The deficiency of plant nutrients in tropical soils is common knowledge. Although Amazonia is characterized by a diversity of soils, reflecting factors such as parent material, climate, flora and past human interference, approximately 75 percent of the *terra firme* soils are classed as nutrient deficient oxisols and ultisols. To ensure food security from such an edaphic base, Amazonians raise low nutrient-demanding crops and diversify the species grown. Investigators of shifting cultivation systems over limited time spans concluded that farmers had to abandon old sites and open new clearings after 2 or 3 years because of declining yields and weed growth. Nevertheless, the system was believed to be an ecologically sound and economically viable form of farming in situations of low population density and abundant forest availability.

Field work in northeast Peru by geographers and anthropologists (Denevan and Padoch 1988, Denevan *et al.* 1984, Hiraoka 1986, Padoch 1988b) have begun to challenge some of the established assumptions of swidden farming. A team led by Denevan conducted research among the Bora Indians and also ***ribereño*** farmers. They determined that swidden is often the initial phase of a long cycle that includes both crops and managed forest vegetation. Subsequently, it was found that the system is widely practiced in Amazonia and elsewhere: ". . . a form of agroforestry involving a combination of annual crops, perennial tree crops, and natural forest regrowth." (Denevan and Padoch 1988:1). In the *caboclo/ribereño* communities, swidden-fallow agroforestry has been adapted to produce for the market (Hiraoka 1986, Padoch, *et al.* 1985, Padoch 1988a). Although the long term sustainability of the system remains to be demonstrated, surveys indicate that this system offers considerable economic potential. Hecht (1982c) and Eden (1982) also discuss varied agroforestry systems.

Exploratory essays in evaluating the energy efficiency of traditional forest management are beginning to appear. In addition to Bergman's (1980) study of Shipibo Indian energetics, Hiraoka (1989a) attempted to compare **[end p. 120]** the labor efficiencies of cash and subsistence cropping under swidden and floodplain farming. Similar techniques also have been applied to evaluate hunting activities among the ribereños of Peru (Hiraoka, n.d.).

Studies of non-colonist, non-riverine *mestizos* have been few. Works (1990) provides a useful examination of house gardens in the Peruvian foothill towns of Moyobamba and Rioja. A few geographers have been interested in the much discussed topic of forest extraction economics (Hecht n.d.; Hecht et al. 1988; Browder n.d.).

Fishing

Fishing is an integral part of peasant economics in Amazonia. It has traditionally supplied the bulk of animal protein to riparian inhabitants. With increasing urbanization, ichthyofaunal demands have increased proportionately because of low cost compared to other sources of animal protein. A comprehensive review of the role of fish in economy, food, and other segments of *caboclo* culture is offered by Smith (1981c). The data, collected among the fishermen of Itacoatiara, 250 kilometers downstream from Manaus, illustrates the significance of fishing in the lives of river folk. The study includes the important topic of folklore in interpreting Amazonian societies. Fishing sites, fishermen's behavior, ichthyofaunal processing and other aspects of the peasants' lives are influenced by folklore and myths. In a brief article, Smith (1983) points out the significance of these lores as mechanisms for the sustainable management of the region's flora and fauna. With the rapid urbanization of the *caboclos/ribereños*, and their involvement with the market economy, the conservation ethics imbedded in traditional beliefs are swiftly disappearing (Hiraoka 1985c).

Highway Impact

The rapid diffusion of transportation and communication technologies is effecting major changes in traditional *caboclo/ribereño* society and economy. These transformations are greatest where communities are linked by roads. Parker (1981) reports on Limoeiro do Ajuru, a town near the mouth of the Rio Tocantins, while Wesche (1985) writes about Itacoatiara. The land use, tenurial, demographic and societal changes that accompany improved accessibility and mobility enabled by highway construction are outlined. Similar changes are even occurring in settlements located on minor tributary streams, such as on the blackwater Río Tamshiyacu in northeast Peru (Hiraoka 1989b).

Research Locations

A review of publications on peasant economies during the past decade reveals a rather uneven distribution. Research occurs in two types of places: in the vicinity of major cities like Belém, Manaus, and Iquitos, or along the Amazon and its main tributaries, such as the Ucayali and the Tocantins. The pattern indicates that the study sites are under strong market influences. Generalizations based on such studies are bound to portray only a segment of reality. Field study sites also show a strong bias toward whitewater floodplains and adjoining interfluves. If Amazon peasant studies are to contribute toward devising ecologically and economically sound resource management systems, defining development policies and enriching academic understanding, data from varied ecological zones are needed. As is now well-recognized, Amazonia is characterized by subtle ecological differences. By recognizing these micro variations, the region's inhabitants have devised appropriate management practices. It remains for the students of the region to uncover the varied techniques and interpret them for scholarly and applied purposes.

Prospects

Significant contributions have been made during the past ten years in Amazonian peasant studies by geographers and others. As the literature on these "less known" Amazonians indicates, *caboclos/ribereños* are storehouses of knowledge on regional flora, fauna and forest ecology. The long-time residents are perhaps the best managers of the region's resources. As such, the riverine peasants have much to contribute to ongoing concerns about sustainable management of forest ecosystems. Some findings (e.g., Padoch 1988a; Peters, Gentry, and Mendelsohn 1989) suggest that local inhabitants have devised not only environmentally compatible resource use practices, but also economically viable systems. An urgent need exists, however, to record caboclo/ribereño knowledge, as well as that of Indians which heretofore have received more attention. Under the weight of rapid urban migrations, increasing participation with national and international economies and societies, and expanding government pressures to integrate, traditional management practices are rapidly being discarded. In recording and interpreting the varied **[end p. 121]** resource use systems, particular attention should be given also to non-farming activities, such as forest and aquatic products extraction and cultural topics such as ethnomedical systems and belief systems.

THE FRONTIER

Colonization

Geographers played a leadership role in studies of frontier settlement and colonization by peasants in Amazonia in the 1960s and 1970s and earlier. This role has diminished in the 1980s, with the major, highly visible books mostly having been published by other social scientists: Moran (1981, 1983), anthropologist; Foweraker (1981), political scientist; Bunker (1985), sociologist; Shoemaker (1981), anthropologist; Schmink/Wood (1984), anthropologist and sociologist; Barbira-Scazzocchio (1980); Fearnside (1986), ecologist; and Schumann and Partridge (1989), anthropologists. The only recently published monographic

treatments by geographers are those by Smith (1982) on the trans-Amazon scheme; Hiraoka (1980a) on Japanese settlement in Bolivia; and Sjoholt (1988) on eastern Peru.

Volume 2 of *Change in the Amazon Basin* edited by John Hemming (1985), Director of the Royal Geographic Society, covers the frontier and includes chapters by geographers Kleinpenning/Volbeda, Mougeot, Townsend and Crossley. Other research articles in the 1980s by geographers on Amazon colonization include Eden/Andrade (1988) on Colombia; Smith (1981b), Sternberg (1981, 1987b), and Wesche (1981, 1983) on Brazil; Henkel (1982), Hiraoka (1980b), Fifer (1982), and Weil (1980, 1983a, 1983b, 1989) on Bolivia; and Bromley (1980) and Hiraoka/Yamamoto (1980) on Ecuador.

The Environmental Impact of Amazon Settlement

Most of the publications cited in the previous section date to the early 1980s and are based on research in the 1970s. By the mid 1980s the focus of Amazon research had shifted from the processes, causes and demography of new agricultural settlement to the environmental impact of this settlement and associated development, particularly cattle ranching but also mining and logging. Today there is a tremendous world-wide interest and concern about Amazonian deforestation, with an explosion of research, media presentations and organizational activity at both NGO and government levels. Geographers were among the first to express alarm in the 1970s (Parsons, Denevan, Sternberg), but they have been pretty much submerged in the mass of recent writing on the Amazon environment. An exception is Susanna Hecht, a highly visible analyst and critic of deforestation, cattle ranching and soil deterioration (Hecht 1981, 1985). Her book with journalist Alexander Cockburn on *The Fate of the Forest* (1989) is one of the most widely read of the many recent books on Amazonia. It is a wide ranging treatment of the history of Amazonia as background to current disasters, with deforestation, forest extraction and the plight of Indian and peasant societies being major themes.

Hilgard Sternberg (1988a, 1988b) continues to be a strong geographical advocate for the Amazon environment. He has written about the increase of flooding as a result of deforestation (1987a), climate change (1986), the consequences of frontier settlement (1981), and the future of the Amazon (1987b). Other recent geographical studies which have examined environmental deterioration in Amazonia include Denevan (1981, 1982b) on the causes of deforestation, and Smith (1981a, 1981c, 1985) on aquatic game and fish depletion.

CONCLUSION

Geographers have been active and innovative researchers on aboriginal and peasant cultures in Amazonia in the 1980s. In addition to numerous articles, twelve books and monographs were published: Bergman (1980), Hiraoka (1980a), Smith (1981c, 1982), Hemming (1987), Sjoholt (1988), Hecht/Cockburn (1989), Eden (1990), and the edited volumes by Hecht (1982b), Hemming (1985), Parker (1985a), and Denevan/Padoch (1988). The overviews by Hecht/Cockburn and by Eden are particularly important in presenting the geographer's perspective to larger audiences. At least five dissertations were completed on Amazonia: Weil (1980), Parker (1981), Hecht (1982a), Works (1985), and McGrath (1989). Hopefully there will be a greater number in the 1990s, as the opportunities for exciting research are considerable.

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Geographers have been at the forefront of data gathering, analysis and discussions regarding traditional subsistence (agroecology, agroforestry, várzea cultivation, forest and river extraction, the protein scarcity thesis) and frontier settlement. They have been less active of late in the dramatic arena of environmental impacts of human activity, with some exceptions, including Hecht and Sternberg[(1)]. Nor have they been

much involved in the current flurry of activity to establish biosphere reserves and the consideration of how these reserves conflict with local Indians and peasants. Field-oriented geographers with people-environment interests and a willingness to tackle the tribulations of Amazonia can make significant and rewarding contributions to all these issues.

1.On the other hand, Bendix and Lieber (1991) overstate the relative lack of research by geographers on Amazonian deforestation. Their study is limited to the 1980s, whereas several geographers pioneered the topic in the 1970s well before the media band wagon. Their survey is also limited to Brazil, a few United States geography journals, and omits books as well as articles by geographers in books and in non-geography journals (except for Hecht).

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