

Roads, Oil and Native People: A Controlled Comparison on the Ecuadorian Frontier

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Abstract

Throughout the Amazon Basin, specialists have debated the causes of deforestation and social dislocation among indigenous communities. Are these impacts due primarily to resource development (oil, gas, minerals) or agricultural expansion? Ecuador offers a laboratory setting to examine this question. The Ecuadorian *Oriente* is divided into four distinct zones: an area with oil development and access roads; another one with oil and no roads; a third area with access roads and no oil; and a fourth with neither oil nor roads. A comparison of such areas clearly shows that roads and agricultural settlement, not oil development, explain existing patterns of deforestation and land loss among native inhabitants. It suggests that current debate over oil development is often misinformed and should pay far greater attention to the government's agricultural policies if further harm is to be avoided.

Introduction

For more than three decades, researchers have tried to account for the impact of government policy on deforestation, loss of indigenous lands and other disruption in Ecuador's eastern rain forest (the *Oriente*).¹ In particular, their attention has focused on oil-producing areas north of the Napo River, which include the traditional territories of Cofán, Siona-Secoya and Huaorani communities.

Since the early 1970s, many lowland areas have been occupied by *colonos* (homesteaders) under Ecuadorian agrarian reform laws.² These settlers were required to "improve" their homesteads by clearing forest and planting crops, usually pasture. The government also offered low-interest loans,

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¹See Jorge Uquillas and Shelton H. Davis, "La cuestión territorial y ecológica entre los pueblos indígenas de la selva baja del Ecuador," in Fundación Gaia and CEREC, *Los derechos territoriales indígenas y ecología en las selvas tropicales del América*, Bogotá: CEREC, 1992, pp. 91-112; James Hicks, ed., *Ecuador's Amazon Region*, Washington: World Bank, 1990; Lucy Ruíz, coord., *Amazonía: escenarios y conflictos*, Quito: CEDIME, 1993; Teodoro Bustamante et al., *Retos de la Amazonía*, Quito: ILDIS, 1993.

² A more detailed description of these laws can be found in Douglas Southgate, Robert Wasserstrom and Susan Reider, "Oil Development, Indigenous Populations and Deforestation in Ecuador's Amazon," presented at the Latin American Studies Association, Rio de Janeiro, June, 2009, <http://terra-group.net/pdfs/lasa.pdf>. For a useful summary of migration patterns in the *Oriente*, see L.A. Brown et al., "Complimentary perspectives as a means of understanding regional change: frontier settlement in the Ecuador Amazon," *Environment and Planning A*, Vol. 24, 1992, pp. 939-961. Throughout this discussion, I will follow common usage among Latin American specialists and use the Spanglish term "colonization" interchangeably with "homesteading," "migration" and "settlement."

subsidies and other incentives to raise cattle. By 1995, nearly one-third of the country's forests had been cleared, while indigenous communities retained only a small fraction of their original lands.³

In this paper, I examine Ecuador's agrarian policies and their impact on the Amazon region. My analysis focuses primarily on the years between 1967, when oil was discovered in the northeastern *Oriente*, and 1994, when the country's Amazonian frontier was closed to further settlement (Map 1). Using four comparative cases, I argue that government officials viewed harm as an acceptable development cost – whether or not officials later came to regret their original decisions or have tried to blame others.⁴

The first land reform, 1964-1972

In 1964, Ecuador's new military rulers decided to address one of the country's most serious economic and political problems: agrarian reform. Since the country's first agricultural census in 1954, many Ecuadorian officials recognized that "agrarian reform was necessary if industrialization was to be achieved."⁵ The census revealed that 0.4% of all owners occupied 45% of total farmland, while 90% of farms (involving half of the country's population) were too small to support a single family.⁶

Previous governments had made timorous efforts to address these problems. In 1957, President Camilo Ponce Enríquez established the Instituto Nacional de Colonización (INC, National Colonization Institute),

³ With one exception: large parts of Huaorani territory – particularly remote areas within the Yasuní National Park and a so-called "untouchable zone" – remain mostly uninhabited.

⁴ This view, with variations, is held by most anthropologists who worked in the *Oriente*, particularly during the 1970s and 1980s. A partial list of references includes Norman Whitten, Jr., *Ecuadorian Ethnocide and Indigenous Ethnogenesis: Amazonian Resurgence Amidst Andean Colonialism*, Copenhagen: IWGIA Document 23, 1976; Ernesto Salazar, *An Indian Federation in Lowland Ecuador*, Copenhagen: IGWIA, Document 28, 1977; Ernesto Salazar, "The Federacion Shuar and the Colonization Frontier," in Norman Whitten, Jr., ed., *Cultural Transformations and Ethnicity in Modern Ecuador*, Urbana: University of Illinois Press, 1981, pp. 589-613; Philippe Descola, "From Scattered to Nucleated Settlement: A Process of Socioeconomic Change among the Achuar," in Norman Whitten, Jr., *Cultural Transformations*, pp. 614-646; Anne-Christine Taylor, "God-Wealth: The Achuar and the Missions," in Norman Whitten, Jr., *Cultural Transformations*, pp. 647-676; Theodore Macdonald, Jr., "Indigenous Response to an Expanding Frontier: Jungle Quichua Economic Conversion to Cattle Ranching," in Norman Whitten, Jr., *Cultural Transformations*, pp. 356-381; Theodore Macdonald, Jr., *Ethnicity and Culture amidst New Neighbors*, Needham: Allyn and Bacon, 1999; Jorge E. Uquillas, "Colonization and Spontaneous Settlement in the Ecuadorian Amazon," in Marianne Schmink and Charles H. Wood, *Frontier Expansion in Amazonia*, pp. 261-284; Jorge E. Uquillas, "Indian Land Rights and Natural Resource Management in the Ecuadorian Amazon," in Theodore Macdonald, Jr., ed., *Native Peoples and Economic Development. Six Case Studies from Latin America*, Cambridge: Cultural Survival, Inc., 1985, pp. 87-103; William T. Vickers, "The Jesuits and the SIL: External Policies for Ecuador's Tucanoans through Three Centuries," Soren Hvalkof and Peter Aaby, eds., *Is God an American? An Anthropological Perspective on the Missionary Work of the Summer Institute of Linguistics*, Copenhagen: IWGIA and Survival International, 1981, pp. 51-62; William T. Vickers, "Indian Policy in Amazonian Ecuador," in Marianne Schmink and Charles H. Wood, eds., *Frontier Expansion in Amazonia*, pp. 8-32; Scott Robinson, "Fulfilling the Mission: North American Evangelism in Ecuador," Soren Hvalkof and Peter Aaby, eds., *Is God an American?*, pp. 41-50; Blanca Muratorio, *The Life and Times of Grandfather Alonso*, New Brunswick: Rutgers University Press, 1991; Thomas Rudel with Bruce Horowitz, *Tropical Deforestation. Small Farmers and Land Clearing in the Ecuadorian Amazon*, New York: Columbia University Press, 1993. More recent discussions can be found in Guillaume Fontaine, *El precio del petróleo*, Quito: FLACSO (co-published with the Instituto Francés de Estudios Andinos and Ediciones Abya Yala), 2007; and Guillaume Fontaine, *Análisis y evaluación de la gestión de los conflictos en el Bloque 10 (Ecuador)*, Quito: FLACSO, 2004.

⁵ Michael Redclift, *Agrarian Reform and Peasant Organisation on the Ecuadorian Coast*, London: Athlone Press, 1978, p. 23.

⁶ José Zevallos, *Oil, Power and Rural Change in Ecuador: 1972-1979*, Madison: University of Wisconsin, Ph. D. dissertation, 1985, p. 17; Redclift, *Agrarian Reform*, pp. 15-23; Oswaldo Barsky, *Iniciativa terrateniente en las transformaciones de la Sierra Ecuatoriana: 1959-1964*, Quito: Pontificia Universidad Católica, 1978, pp. 77-81.

which later became the Instituto Ecuatoriano de Reforma Agraria y Colonización (IERAC, the Ecuadorian Institute for Agrarian Reform and Resettlement). But support for land redistribution – inside the government and outside of it – was always limited.⁷ Among other things, landowners objected to the abolition of indebted labor (known as *precarismo* or *huasipungo*) on their estates. As British sociologist Michael Redclift writes, “Five years after the 1964 Law was introduced it was calculated that, at the current rate at which land was being handed over to former *huasipungeros*, it would be one hundred and seventy years before all the *precaristas* in Ecuador were in possession of land.”⁸

Although land reform largely failed in the highlands, the government achieved greater success in resettling impoverished families on “vacant lands” along the northern coast and in the southern Amazon. In 1963, military rulers had asked the Junta Nacional de Planificación y Coordinación Económica (National Planning Board) to prepare an inventory of potential “colonization” areas, along with a master plan for settling them (Map 2).⁹

Based on this report, the government issued a ten-year National Development Plan that included extensive settlement in the *Oriente*. According to the World Bank, this plan “proposed a system consisting of (a) support of spontaneous settlements by providing basic infrastructure and services and (b) establishing new projects with land use and settlement patterns planned in advance, but with Government intervention limited to construction of basic infrastructure and services, leaving to the settlers the initiative to move themselves into the areas and to develop their farms.”¹⁰

But without roads, most of the Amazon remained out of reach.¹¹ Until the mid-1960s, only one underpopulated part of Ecuador could be reached by highway: the coastal rain forest near Santo Domingo de

⁷ For a discussion of early land reform efforts, see Carlos Luzuriaga and Clarence Zuvekas, Jr., *Income Distribution and Poverty in Rural Ecuador, 1950-1979*, Tempe: Arizona State University, 1983; also Zevallos, *Oil, Power*.

⁸ Redclift, *Agrarian Reform*, p. 27. According to the World Bank, only 15% of the land designated for redistribution was turned over to smallholders. As a result, the Bank reported, “Farms of less than 5 hectares accounted for 75 percent of the number of all farms, but held only 11 percent of all arable land, compared to farms exceeding 500 hectares, which held 78 percent of total land.” See World Bank, *Ecuador: Development Problems and Prospects*, Washington: World Bank, 1979, pp. iv-v.

⁹ Junta Nacional de Planificación y Coordinación Económica (JNPC), *El aprovechamiento de la tierra y el mar, Tomo II, Reforma a la Estructura de Tenencia de la Tierra y Expansión de la Frontera Agrícola, Capítulo Capítulo II, Colonización*, Quito: 1963. “Colonization is a matter of public interest and should take maximum advantage of appropriate lands to expand agricultural production by settling rural families on their own parcels, improving their standard of living and helping them to use more efficient and rational agro-economic techniques.” See JNPC *Colonización*, p. 5.

¹⁰ World Bank, *Ecuador. Development Problems*, p. 186.

¹¹ An early discussion can be found in Ray Bromley, “The Colonization of Humid Tropical Areas of Ecuador.” *Singapore Journal of Tropical Geography*, Vol. 2, No. 1, 1981, pp. 15-26. In a few instances, large *haciendas* spread along the most accessible headwaters of major rivers: the Napo, Pastaza and Cururay. But these early pioneers often seemed to be more interested in speculation than permanent occupation. According to Jorge Uquillas, they included “farmers who genuinely intend to work their land, as well as other people who, through their connections and influence, obtain properties where they plan to use hired labor or simply to resell. Even worse, a large number of loggers and land speculators in the area claim to be small farmers and apply for land title with no intention of developing their parcels. Instead, their objective is to cut the best timber and sell whatever is left.” See Jorge Uquillas, “Colonización y Asentamientos Espontáneos en la Amazonía Ecuatoriana,” in Carlos Aramburú and Carlos Mora, eds., *Desarrollo Amazónico: Una Perspectiva Latinoamericana*, Lima: CIPA-INANDEP, 1986, pp. 359-383. Whitten reports similar events in the area around Puyo. See Norman Whitten, Jr., *Sacha Runa*, Urbana: University of Illinois Press, pp. 244-246. L. Brown and his coauthors point out that early migrations closely followed commodity cycles: “With respect to the Oriente, increases in world demand for rubber, gold, quinine and petroleum motivated successive waves of settlement, and decreases in demand dampened or reversed those waves, leading to a boom and bust economy” See L. Brown et al., “Complimentary perspectives as a means of

los Colorados, between Quito and Esmeraldas. Then beginning in 1965, another region opened to colonization: the Andean foothills of Morona Santiago province, east of Cuenca. With support from the Inter-American Development Bank, local authorities in Cuenca built a road network that eventually extended deep into “unoccupied” areas that lay within traditional Shuar and Achuar territory.¹² By 1973, IERAC had issued provisional title for 212,000 hectares to 4,000 beneficiaries.¹³

The second land reform, 1973-1979

In 1966, Ecuador’s military authorities relinquished power to a civilian administration that governed until 1972, when the armed forces again took control.¹⁴ By this time, highland *hacendados* had sold off significant holdings, but they still owned a third of the country’s total (and best) agricultural land.¹⁵ Meanwhile, 70% of rural households tried to survive on less than 8% of all farmland.¹⁶ Food production largely remained stagnant.

One major reason for the 1972 military coup involved oil. In 1967, the Texaco-Gulf Consortium (known as Texpet) had made its major discovery near Lago Agrio; production was scheduled to begin in June, 1972. Senior military leaders feared that petroleum revenues would be squandered or misspent by civilian politicians.¹⁷ They also believed that oil money would give them a unique opportunity to address the country’s unresolved economic and social problems.¹⁸

Almost immediately after taking power, military rulers reorganized the new state oil company, CEPE (later renamed Petroecuador), and joined OPEC. They rewrote the National Hydrocarbon Law to ensure government ownership of the country’s petroleum reserves, along with its exclusive right to explore and develop them. New contracts were signed with Texpet and other operators that brought in CEPE as an equity partner. Henceforth, foreign companies – working as partners or contractors to CEPE – were “required to pay surface and entry rights, royalties, tax contributions for education, transportation fees for pipeline usage, and compensatory public works in the region contracted.”¹⁹

understanding regional change: frontier settlement in the Ecuador Amazon,” *Environment and Planning A*, Vol. 24, 1992, p. 951.

¹² World Bank, *Ecuador. Development Problems*, pp. 191-211; Thomas Rudel with Bruce Horowitz, *Tropical Deforestation. Small Farmers and Land Clearing in the Ecuadorian Amazon*, New York: Columbia University Press, 1993, pp. 63 and 67; see also L. Brown et al, “Urban-System Evolution in Frontier Settings,” *Geographic Review*, Vol. 84, No. 3, 1994, pp. 249-265.

¹³ World Bank, *Ecuador. Development Problems*, p. 210.

¹⁴ Civilian government was finally restored in 1979.

¹⁵ Barsky, *Iniciativa terrateniente*, p. 113. In 1964, according to Dutch economist Rob Vos, 88% of large highland properties (above 100 hectares) remained uncultivated; by 1974, this figure had dropped to only 5%. “A large part of this area was converted to extensive livestock production because landowners feared expropriation if their land remained underutilized. Extensive cattle raising allowed them to retain their properties without greater capital investment in capital or organization.” See Rob Vos, “Petróleo, estado y cambio agrario. Ecuador 1972-1984,” in Pierre Gondard et al., *Transformaciones agrarias en el Ecuador*, Quito: CEDIG, 1988, p. 21.

¹⁶ Zevallos, *Oil, Power*, p. 17. See also World Bank, *Ecuador. Development Problems*, p. iv.

¹⁷ George Philip, *Oil and Politics in Latin Americas*, Cambridge: Cambridge University Press, 1982, pp. 276-279; Zevallos, *Oil, Power*, pp. 18-37; John Martz, *Politics and Petroleum in Ecuador*, New Brunswick: Transaction Books, 1987, pp. 97-130. A detailed account of these events is given by José Zevallos in *Cronología de la política agraria en el Ecuador, 1972-1979*, Quito: Pontificia Universidad Católica del Ecuador, 1985.

¹⁸ Philip, *Oil and Politics*, p. 276-279; see also José Zevallos, *El estado ecuatoriano y las transnacionales petroleras: ochos años de alianza y conflictos*, Quito: Ediciones de la Universidad Católica, 1981.

¹⁹ Martz, *Politics*, p. 61.

The emphasis on public works is significant. Since the 1920s, when it adopted its second *Ley del Oriente*, the Ecuadorian government had looked to oil companies for “dual purpose” infrastructure. Writing about an agreement with Leonard Exploration Company in 1921, for example, the Interior Minister declared that “the problem of roads is now solved...in relation to a contract already celebrated for oil exploration in this territory.”²⁰ As a result of oil exploration, he continued, Ecuadorians in the *Oriente* would soon enjoy all the benefits of modern society.

In 1947, Shell built a road from Ambato (in the southern highlands) to Puyo, opening part of the central Amazon to settlement. It also built an airport at Shell-Mera and a network of local penetration roads.²¹ As oil exploration proceeded, these roads were extended and eventually connected to the southern highway from Morona Santiago. After the government issued its settlement plan in 1963, such projects were no longer simply opportunistic; they became part of an overall strategy to colonize the rain forest.

In September, 1971, at the government’s direction, Texpet completed a highway from Quito to Lago Agrio (paved in 1972). By contract, Texpet was also required to build other infrastructure – highways, bridges and the Lago Agrio airport – worth \$55.5 million (including \$20 million of penetration roads unrelated to oil).²² For the first time, Ecuadorian officials could now envision fulfilling their aspiration of colonizing the northern Amazon (Map 3).

Like its predecessor, the military government that came to power in 1972 viewed land reform as an essential precondition for economic progress. Ecuadorian sociologist José Zevallos writes that it “considered agrarian reform a prerequisite for improving distribution of rural incomes and increasing agricultural productivity.”²³ In turn, more equitable distribution “was needed to enlarge the market for industrial goods and sustain industrial growth. That sustained industrial growth would then create new jobs and increase the demand for agricultural goods.”

But reform advocates quickly ran into opposition from landowners and more conservative military officers. As in 1964, proposed ceilings on landholdings became the stumbling block. As a compromise, the 1973 Agrarian Reform Law set no limits on farm size, as long as these holdings fulfilled their “social function”: efficiency and agricultural production.²⁴

Three years later, the government veered rightward. In January, 1976, President Guillermo Rodríguez Lara was replaced by a triumvirate of moderate-to-conservative service chiefs who no longer viewed land redistribution as a social priority.²⁵ Flush with oil money, the government tripled its outlays for

²⁰Quoted in Muratorio, *Life and Times*, p. 114.

²¹ Muratorio, *Life and Times*, p. 168. According to Luzuriaga and Zuvekas (p. 152), “The frontier town of Puyo was established in 1899 but there was little settlement in the area until completion in 1947 of the Baños-Puyo road, which linked the area with Ambato, the capital of Tungurahua Province, and thus to the major markets in the Sierra. The road linking Puyo and Tena, 70 kilometers to the north, was begun in 1950...”

²² Ministerio de Recursos Naturales y Energéticos, *Contrato celebrado entre el Gobierno del Ecuador* (Ministerio de Recursos Naturales y Energéticos) a favor de las Compañías, ‘Ecuadorean Gulf Oil Company’ y ‘Texaco Petroleum Company,’ Quito, 6 de Agosto de 1973 [“Contract between the Government of Ecuador Ministry of Natural and Energy Resources) and Ecuadorean Gulf Oil Company and Texaco Petroleum Company”], p. 37; see also “Texaco’s Ecuador Record Still Intact,” *Oil & Gas Journal*, April 28, 1969, p. 48.

²³ Zevallos, *Oil, Power*, pp. 41-42.

²⁴ Zevallos, *Oil, Power*, pp. 49-52. As Redclift writes, “By 1973 it was abundantly clear that no redistributive land reform was likely, at least in the short term, and that the main efforts of the military would be expended in efforts to ‘modernize’ agricultural production on the *latifundia*.” See Redclift, *Agrarian Reform*, p. 33.

²⁵ Zevallos, *Oil, Power*, p. 43.

agricultural credit, repealed taxes, subsidized fertilizer for larger farmers and took other steps to encourage private investment.²⁶ Meanwhile, only 47,400 *ex-huasipungueros* and their families had benefited from land redistribution since 1964; most of them survived on small, unimproved plots of less than three hectares.²⁷

But what to do with the 1,850,000 highland peasants who had received nothing under land reform? Most of these families lived on less than one hectare and survived as seasonal migrants on coastal plantations or in the cities. In some places, they were crowded into rural communities at densities that exceeded 500 people per square km – unsustainable by any calculation.

“In this context,” writes Zevallos, “colonization became an alternative to agrarian reform.”²⁸ In 1972, as the Quito-Lago Agrio road was nearing completion, the government declared that oil development would enable the northeast to become a target “area for migration and expansion.”²⁹ It offered 50-hectare parcels of land in the *Oriente* and required settlers to clear half of it within five years to show “effective use.” Colonization, not land reform, became the dominant force in reshaping Ecuador’s countryside (Figure).³⁰

Patterns of resettlement

Did oil operations cause deforestation and loss of native land, as many specialists have argued, or did these problems occur as an inevitable consequence of misguided government policies?³¹ The Ecuadorian Amazon offers a unique opportunity to examine this question by providing four comparable cases:

- Case 1: The northern *Oriente*, which included roads, oil development, and colonization.
- Case 2: Pastaza Province (east of Puyo): oil development without roads or colonization.
- Case 3: Morona Santiago Province: roads and colonization without oil development.
- Case 4: The remote frontier: no oil, roads or colonization.

Case 1: The northern Oriente (oil development, roads and colonization)

Until 1972, a few migrants entered this area, mostly settlers pushing north along the Puyo-Tena road. After the highway from Quito to Lago Agrio was completed, however, migrant families poured into the

²⁶ Zevallos, *Oil, Power*, p. 71. Redclift (*Agrarian Reform*, p. 32) estimates that investments in publicly financed agricultural development increased ten-fold.

²⁷ Luzuriaga and Zuvekas, *Income Distribution*, p. 168.

²⁸ Zevallos, *Oil, Power*, p. 95.

²⁹ Corruption and mismanagement also plagued the colonization program. Citing a report by British geographer Raymond Bromley, for example, Luzuriaga and Zuvekas note that “Despite this decree, large landholdings had been created along these roads, as army officers and Ecuadorean officials of the petroleum companies managed to acquire land. These purchases were largely speculative, and absentee ownership was common” (*Income Distribution*, p. 151).

³⁰ The government’s views are outlined in many documents from that period, including various National Development Plans. Another good source can be found in IERAC, *La regionalización para la reforma agraria*: Quito: IERAC, 1976. For discussions of these policies, see Zevallos, *Cronología*; Oswaldo Barsky et al., *Políticas agrarias, colonización y desarrollo rural en Ecuador*, Quito: OEA, 1982.

³¹ In our analysis of deforestation, we have used satellite imagery from 2000 because this is the first year that it was available after the frontier was closed. For a list of sources, see Table 2.

region (currently divided among Napo, Sucumbíos and Orellana Provinces) from all over Ecuador, especially drought-stricken Loja Province in the south.

Table 1: Population of the Northern *Oriente*, 1962-1992
(currently, Napo, Orellana and Sucumbíos Provinces)

Year	Population ³²
1962	25,582
1974	55,142
1982	115,110 ³³
1992	371,110

Colonization had significant consequences for native people living in the northeastern rain forest. Virtually all of the “vacant” land identified by government officials in their 1963 settlement plan was located within traditional territories used by the Cofán, Siona-Secoya and Huaorani people. According to the Ecuadorian sociologist Jorge Uquillas,

The fact that large portions of land are considered "fallow" or have no owner other than the state (frequently ignoring prior rights of possession of indigenous inhabitants) has incited the unrestrained taking of lands by immigrants to the petroleum zone. In areas of highway construction (or projected construction), colonists take possession of the land and commence deforestation. Shortly thereafter they plant such crops as maize, bananas, and pasture.³⁴

Initially, IERAC made small land grants – totally around 20,000 hectares – to various Cofán, Siona-Secoya and Huaorani families. Conflict arose almost immediately. In many cases, these areas were already occupied by settlers, or they included one bank of a common river, or looped around a road that provided open access to anyone.³⁵

In September, 1980, government officials convened an inter-ministerial committee to solve this problem. Most of its members represented traditional "developmentalist" agencies who felt that 50 hectares per family was generous for semi-nomadic native farmers and that larger land grants would be wasted. Outside experts (including anthropologists) conducted field studies among the Cofán, Siona-Secoya and Huaorani, and tried to explain why native economies required more extensive lands. The committee received their findings skeptically:

³²Henri Barral, “Poblamiento y colonización espontánea en la Provincia del Napo en 1977,” Quito: Centro Ecuatoriano de Investigación Geográfica, Documentos de Investigación No. 3, 1983,” pp. 53-67; Uquillas, “Colonization and Spontaneous Settlement,” pp. 261-284; Lucy Ruíz, *Amazonía ecuatoriana. Escenario y actores del 2000*, Quito: EcoCiencia-Comité Ecuatoriano de la UICN, 2000; Jorge Trujillo, “Colonización en la región amazónica ecuatoriana,” Quito: unpublished manuscript, 2007, p. 20.

³³ According to Henri Barral, 26% migrated from Loja and 20% from the Pacific Coast. See Barral, “Poblamiento,” pp. 53-67.

³⁴ Uquillas, "Colonization in the Ecuadorian Amazon," pp. 276-77.

³⁵ For a description of these problems, see William T. Vickers, Jr., “Informe preliminar acerca de las culturas siona, secoya y cofán para la Comisión Interinstitucional de INCRAE, IERAC, y Dirección de Desarrollo Forestal. Proyecto de Relimitación de Territorios Nativos,” Miami, 1980 (unpublished manuscript); Jorge E. Uquillas, “Informe para la delimitación de territorios nativos siona secoya, cofán y huaorani,” Quito: Ministerio de Agricultura y Ganadería, Comisión Asesora Interinstitucional, 1982, pp. 5-18; Jorge E. Uquillas, "La tenencia de la tierra en la Amazonía ecuatoriana," in Bustamante et al., *Retos*, pp. 61-94.

The author [Uquillas, who headed the technical team] spent nearly two years defending the objectives of the study and arguing for the feasibility of the recommended solutions... At the beginning, the project was heavily influenced by technical participants (four anthropologists, a sociologist, three biologists and an engineer-agronomist). In the final stages, high ranking officials from participating public institutions, most of whom were agricultural technicians with political considerations high in their minds, determined the outcome.³⁶

Ultimately, committee members approved modest expansions of indigenous lands.³⁷ By 1990, the Siona-Secoya had obtained title to just over 40,000 hectares; almost 680,000 hectares of Huaorani land were legally protected from invasion; eventually, the Cofán received 34,000 hectares (subsequently increased to 69,000 hectares). For the Cofán and Siona-Secoya, such grants ensured the survival of a few settlements, but excluded most of their original territories (totaling nearly around 300 sq. km).

Homesteading was not successful for everyone. Only the first homesteaders along each new road enjoyed relatively easy access to outside markets and could plant bulky crops like coffee, maize or plantains.³⁸ Later arrivals moved farther into the hinterlands, with little prospect of raising anything but cattle. By 1978, according to geographers Mario Hiraoka and Shozo Yamamoto, “colonists were clearing parcels ... eight or ten kilometers distant from the trunk routes.”³⁹ Many farmers of these failed, because they missed their annual payments, lacked credit, lost cattle, or couldn’t grow enough food. IERAC procedures were complicated and often required fees, bribes and expensive trips to Quito or Lago Agrio. “As a result,” Hiraoka and Yamamoto noted, “inhabitants with seven or eight years of residence in the area possess only provisional land titles.”⁴⁰

Without permanent title, land could not be legally sold. When hardship struck, many *colonos* abandoned remote farms for a fraction of their potential market value. According to Hiraoka and Yamamoto, colonization policies effectively divided settlers into three groups:

The first group, *comerciante*, consists of wealthy absentee owners... After land acquisition, in an effort to avoid expropriation, the legal applicant constructs a dwelling and hires laborers to clear and bring into cultivation the minimal area stipulated by IERAC... The second group, *transitorio*, comprises small farmers who have abandoned their plots for reasons beyond personal control... These tracts are desirable for conversion to pasture, because a sizable proportion of the forest has already been cleared. The third group, *permanente*, includes individuals who have survived the initial years and have established a firm foothold through either crop cultivation or ranching.⁴¹

Mismanagement and corruption, they predicted, would soon reproduce inequalities prevailing in other parts of Ecuador: “thus, social and economic roles envisaged for the *Oriente* – provision of better

³⁶ Uquillas, "Indian Land Rights," p. 93.

³⁷ In a few cases, communal territories were recognized under the 1937 Rural Communes Law; in other cases, these groups were required to form cooperatives, like homesteaders.

³⁸ Each homestead measured 200-250 meters wide by 2 km deep.

³⁹ Mario Hiraoka and Shozo Yamamoto, “Agricultural Development in the Upper Amazon of Ecuador,” *Geographical Review*, Vol. 70, No. 4, 1980, p. 429. The Belgian sociologist Nicholas Eberthart recounts a similar story. See Nicolás Eberthart, *Transformaciones agrarias en el frente de colonización de la Amazonia ecuatoriana*, Quito: Ediciones Abya-Yala, 1998.

⁴⁰ Hiraoka and Yamamoto, “Agricultural Development,” p. 434.

⁴¹ Hiraoka and Yamamoto, “Agricultural Development,” p. 434.

financial opportunities and the poor and relief of demographic pressures from the Andean core regions – will not be realizable.”⁴²

To make matters worse, government officials also allocated far larger parcels in the northern *Oriente* to commercial agriculture. By 1978, they had already given grants of 10,000 hectares and 60,000 hectares to corporate operators for oil palm and livestock production. Subsequently, 9,500 hectares of traditional Siona-Secoya hunting territory were awarded to Palmeras del Ecuador for an African oil palm plantation.⁴³

Social inequality and native dispossession were not the only consequence of government policy. By 1993, illegal squatters had caused extensive damage to the Cuyabeno Wildlife Reserve. In fact, many of these migrants arrived to cut timber, not farm. And finally, semi-clandestine logging spread along roads built in 1983-84 by Petroecuador, which drilled several production wells just outside the Reserve.⁴⁴ The government declined to provide additional park rangers or police. A few years later, this cycle has now been repeated in the Yasuní National Park (Map 4).⁴⁵

Case 2: Pastaza Province (oil development without roads)

Pastaza Province shares a long border with Peru, dotted with army garrisons. Until 1947, its capital, Puyo, was home to a Catholic mission and small neighboring village. Completion of roads to Macas and Ambato made it a commercial and administrative center. By 1966, it was surrounded by large ranches and sugar plantations, as landowners took advantage of the 1964 Agrarian Law to annex lowland Quichua (Runa) territory.⁴⁶

Traditionally, lowland Quichua people were divided into two groups: Quijos (Napo Runa) and Canelos (Puyo Runa). Scholars generally agree that both groups were formed over the past two centuries from fragments of other ethnicities that adopted Quichua as their *lingua franca* and dispersed along the Napo, Bobonaza and Curaray Rivers.⁴⁷ By the mid-19th Century, many Runa – at least the ones who lived closest to Puyo and Tena – had become indebted peons on lowland *haciendas*.⁴⁸

⁴² Hiraoka and Yamamoto, “Agricultural Development,” p. 433.

⁴³ Rudel, *Tropical Deforestation*, p. 163.

⁴⁴ INEFAN, “Documentación sobre la problemática de los colonos en la Reserve de Producción Faunística Cuyabeno,” Quito: 1993; Paul E. Little, *Amazonia. Territorial Struggles on Perennial Frontiers*, Baltimore: Johns Hopkins, 2001. INEFAN was Ecuador’s National Forest Service, subsequently incorporated into the Ministry of Environment. For details about Petroecuador’s roads and drilling in the area, see Martz, p. 364.

⁴⁵ For an account of this problem, see Guillaume Fontaine and Iván Narváez, *Yasuní en el siglo XXI*, Quito: FLACSO, 2007.

⁴⁶ Edmund Eduard Hegen, *Highways into the Upper Amazon Basin*, Gainesville: University of Florida Press, 1966, p. 125; Blanca Muratorio, *Life and Times*, p. 142.

⁴⁷ Udo Oberem, *Los Quijos. Historia de la Transculturación de un Grupo Indígena en el Oriente Ecuatoriano (1538-1956)*, Madrid: Universidad de Madrid, 1971; John Edwin Huddleson, *The Expansion and Development of Transitional Culture in the Upper Amazon Basin*, New York: Columbia University, Ph.D. dissertation, 1981; Mary Louise Reeve, *Identity as Process: The Meaning of Runapura for Quichua Speakers of the River Curaray, Eastern Ecuador*, Urbana: University of Illinois, Ph.D. dissertation, 1985; Jorge Trujillo, *Memorias del Curaray*, Quito: FEPP, 2001; Muratorio, *Life and Times*. A useful summary of Quichua “ethnogenesis” can be found in Guillaume Fontaine, *Análisis y evaluación de la gestión de los conflictos en el Bloque 10 (Ecuador)*, Quito: FLACSO, 2004. Ethnographic descriptions of the lowland Runa include Whitten, *Sacha Runa*; and Theodore Macdonald, Jr., *De cazadores a ganaderos*, Quito: Ediciones Abya-Yala, 1997; Theodore Macdonald, Jr., “Indigenous Responses to an Expanding Frontier”; and Theodore Macdonald, Jr., *Ethnicity and Culture*.

⁴⁸ For detailed descriptions, see Muratorio, *Life and Times*; Thomas Albert Perreault, *Movilización política e identidad indígena en el alto Napo*, Quito: Ediciones Abya-Yala, 2002; Jorge Trujillo, *Memorias*.

Until the 1940s, many Quichua-speaking communities practiced shifting horticulture, hunting and fishing.⁴⁹ But the mid-20th Century brought increased trade and also offered opportunities to work for petroleum companies. Wages in the oil fields were far superior to peonage on lowland *haciendas*.⁵⁰ A mixed economy developed that combined wage labor, gold panning and rubber gathering, along with subsistence farming.⁵¹

At first, local men worked for Shell, which explored for oil in Pastaza until 1948. Later, they signed on with Texaco or other companies in the northern *Oriente*. Although a few families moved to Lago Agrio, more often the men took temporary jobs there (the normal contract for laborers lasted 90 days), while their wives and children remained behind to farm.⁵²

But this situation changed as early *colonos* invaded Runa territory along the Puyo-Tena road. Anthropologist Theodore Macdonald, Jr., has provided an illustrative example of this process in one remote community, Pasu Urcu.⁵³ In the early 1960s, 50-60 migrant families settled around Pasu Urcu with support from the National Colonization Institute.⁵⁴ In response, the Runa there subdivided 3,000 hectares of communal lands into individual parcels, which they cleared for pasture. They understood the 1964 Agrarian Reform Law and the laws that followed – many of them had moved from Tena to escape colonization – and they took preemptive action.⁵⁵

Farther south, around Puyo, Quichua communities also shifted to cattle production in self-defense. In his well-known ethnography *Sacha Runa*, anthropologist Norman Whitten, Jr., wrote that “a cattle complex was rapidly developing in the Puyo area [after 1964], and within a few years most of the forest around the town...had been completely replaced by coarse, high grass...”⁵⁶

Far from the highway, however, a different scenario was unfolding. Huaorani raids still occurred regularly, Shell had found no oil during the 1940s and 1950s, and consequently it had built no roads.

In 1988, ARCO signed a contract with Petroecuador to explore Shell’s old fields in Pastaza. A few years later, it discovered significant reserves in Villano, a cluster of several small villages located in the rain forest about 100 km east of Puyo.⁵⁷ In 1998, it completed work on production facilities and a secondary pipeline connecting Villano with SOTE, Ecuador’s main pipeline system.

To minimize environmental impact, ARCO built its facilities using an “off-shore” model that required no roads. During construction, all equipment, supplies and workers were transported by helicopter. A small “flow line” was laid above ground to avoid damaging tree roots and leave the forest canopy intact. Oil

⁴⁹ Macdonald, “Indigenous Responses to an Expanding Frontier,” p. 358.

⁵⁰ For example, Perreault writes that “Petroleum development and indigenous participation in it profoundly altered productive relations in the area and helped to end debt peonage on local haciendas. Oil production also encouraged indigenous organization and political mobilization – more in the central Oriente than in the Upper Napo – which played an important role in native politics on the regional and national levels.” See Perreault, *Movilización*, p. 33.

⁵¹ Macdonald, “Indigenous Responses to an Expanding Frontier,” pp. 360-367.

⁵² Hiraoka and Yamamoto, “Agricultural Development,” p. 427; Whitten, *Sacha Runa*, pp. 252-254.

⁵³ Macdonald, “Indigenous Responses to an Expanding Frontier,” p. 360.

⁵⁴ Macdonald, “Indigenous Responses to an Expanding Frontier,” p. 361.

⁵⁵ Macdonald, “Indigenous Responses to an Expanding Frontier,” pp. 360-361. In one area, 2,290 hectares were cleared out of 2,300 hectares. For a more detailed treatment, see Macdonald’s book *De cazadores a ganaderos*.

⁵⁶ Whitten. *Sacha Runa*, p. 247.

⁵⁷ Trujillo, *Memorias*. For an excellent summary of these events, see Fontaine, *Análisis y Evaluación*, pp. 7-9.

was stored at a central processing facility near Puyo to minimize the “footprint” at Villano.⁵⁸ Where the flow line emerged from undisturbed forest, it was deliberately routed across an impassible escarpment to avoid providing easy entrance for potential settlers.

Opposition to the off-shore model came from two quarters: local communities and Petroecuador. Community members lobbied intensively for an access road that would allow them to transport their cattle and other products for sale in Puyo. When ARCO refused, they held three company employees hostage for ten days until provincial leaders negotiated their release.⁵⁹

Petroecuador also wanted a road: in its view, road construction remained a key to economic development in the region and part of its public responsibilities. After lengthy discussions, ARCO agreed to build secondary roads elsewhere along the Puyo-Baeza Highway in areas where deforestation had already occurred. In 2001, satellite imagery showed that only 1.6% of the Villano area had been deforested (Map 5).⁶⁰

Case 3: Morona Santiago (Roads and colonization without oil)

In 1893, Salesian missionaries from Italy arrived in Morona Santiago to “civilize and indoctrinate” Shuar and Achuar communities (collectively known as “Jivaro”) numbering perhaps 10,000 inhabitants.⁶¹ Until the mid-1960s, these groups lived in extended households headed by closely related men.⁶² Large distances separated family groups.

⁵⁸ *Oil & Gas Journal*, “ARCO's Villano project: Improvised solutions in Ecuador's rainforest,” August 2, 1999, <http://www.ogj.com/index/article-display/31677/articles/oil-gas-journal/volume-97/issue-31/special-report/arcos-villano-project-improvised-solutions-in-ecuadors-rainforest.html>. For construction details, see Robin Draper and Christopher Slack, “Narrow rain forest ROW forces innovation for Ecuadorian flowline installation,” *Oil & Gas Journal*, June 19, 2000, <http://www.ogj.com/index/article-display/75621/articles/oil-gas-journal/volume-98/issue-25/transportation/narrow-rain-forest-row-forces-innovation-for-ecuadorian-flowline-installation.html>. See also ARCO Oriente, *Villano Project*; Quito: ARCO Oriente, 1999.

⁵⁹These events are described in detail by Guillaume Fontaine in *Análisis y evaluación*. Negotiations were conducted by leaders from the *Organización de Pueblos Indígenas de Pastaza* (OPIP, the Organization of Native Peoples of Pastaza). For a description of OPIP and its history, see Suzana Sawyer, *Crude Chronicles*. A discussion of ARCO's relations with native communities and indigenous federations can be found in Sixto Mendez, Jennifer Parnell and Robert Wasserstrom, “Seeking Common Ground. Petroleum and Indigenous Peoples in Ecuador's Amazon,” *Environment*, Vol. 40, No. 5, June, 1998, pp. 12-45.

⁶⁰ MODIS satellite image composite showing tree cover from November 2000 – November 2001. modis@geog.umd.edu. Forested area calculations from EarthSat GeoCover-LC Landsat TM image product. 1999 – 2001. Analysis was provided by Dr. James Ellis of Ellis Geospatial.

⁶¹ Ernesto Salazar “The Federación Shuar and the Colonization Frontier,” in Whitten, *Cultural Transformations*, p. 605; Salazar, *Indian Federation*; Rafael Karsten, *The Head-Hunters of Western Amazonia: the life and culture of the Jibaro Indians of eastern Ecuador and Peru*, Helsinki: Societas Scientiarum Fennica, 1935; Descola, “From Scattered to Nucleated Settlement”; and Taylor, “God-Wealth.” See also Philippe Descola, *In the Society of Nature*, Cambridge: Cambridge University Press, 1966; Michael J. Harner, *The Jivaro. People of the Sacred Waterfalls*, Garden City: Doubleday, 1972. For historical accounts, see Hegen, *Highways*; and F.W. Up de Graf, *Head Hunters of the Amazon*, New York: Garden City Publishing, 1923.

⁶² Harner, *The Jivaro*; Taylor, “God-Wealth.”

Periodically, Jivaro war parties raided other Shuar and Achuar settlements. During these raids, several families might come together in one large house until the danger had past.⁶³ Between 1940 and 1960, according to French anthropologist Anne-Christine Taylor, such raids became so frequent that half of Achuar men were killed in warfare. Survivors described those years as a time when “we were ending.”⁶⁴

Around 1900, one small group of 400 migrants settled in the Upano Valley, located within Shuar territory along the Andean foothills. Unable to transport their crops to the highlands, they remained isolated and cut off from outside markets. Other settlers began to arrive in the 1930s, when Salesian missionaries built a trail through the mountains to their mission in Méndez, located in the lowlands 100 km east of Cuenca.

Conflict quickly arose between colonists and Shuar communities in the Upano region. “As the colonists became more numerous during the 1930s and 1940s,” writes American anthropologist Thomas Rudel, “their demands for land began to disturb the Shuar. The colonists converted as much forest to pasture as possible; only the steepest slopes remained forested....In contrast the Shuar practiced shifting cultivation which left the basic structure of the forest intact.”⁶⁵

By the 1950s, Salesian missionaries became alarmed at the growing influx of settlers and occupation of native territories. Early efforts to obtain land titles for Shuar families went awry when native “landowners” sold their parcels to outsiders.⁶⁶ The Salesians then hit upon the idea of forming *centros* (centers) under the 1937 Rural Communes Law:

The Shuar in an area would form a *centro*, an organization of villagers, and it would receive title to a large tract of land around the village. Each household in the village would receive a tract of land in the *centro*. Household heads could sell their land to other members of the *centro*, and they could pass it on to their sons and daughters, so individuals considered themselves to be the “owners” of their tract of land. They could not sell their land to outsiders.⁶⁷

In 1964, Shuar leaders formed the *Federación de Centros Shuar* (FICSH, the Federation of Shuar Communities), which began an aggressive campaign to defend Shuar territory.⁶⁸ By the late 1970s, according to Ecuadorian anthropologist Ernesto Salazar, 26,800 people living in 138 *centros* had joined the Federation, which soon became a major force in the country’s nascent indigenous movement.⁶⁹

Settlers reacted forcefully. In 1977, they persuaded the military government to create a “national reserve” for colonists east of the Cordillera de Cutucú.⁷⁰ Between 1976 and 1988, IERAC slowed its processing of Shuar and Achuar land claims, giving migrants time to occupy new land. Still, 83% of eastern Morona Santiago remained in native hands.⁷¹ By the late 1980s, the settlement frontier stabilized, because no new roads were built farther east.

⁶³ Harner, *The Jivaro*; Taylor, “God-Wealth.” Daniel Steel has recently reanalyzed this warfare and related it to changing patterns of external trade. See his article “Trade Goods and Jivaro Warfare: the Shuar 1850-1957, and the Achuar, 1940-1978,” *Ethnohistory* Vol. 46, No. 4, 1999, pp. 745-776.

⁶⁴ Taylor, “God-Wealth,” p. 651.

⁶⁵ Rudel, *Tropical Deforestation*, p. 76. For a description of Shuar and Achuar subsistence farming, see Descola, “Settlement”; and Descola, *Society*.

⁶⁶ Rudel, *Tropical Deforestation*, p. 77.

⁶⁷ Rudel, *Tropical Deforestation*, p. 77.

⁶⁸ Salazar’s two articles remain the best contemporary sources of information about this process.

⁶⁹ Salazar “Federación Shuar,” p. 599.

⁷⁰ Rudel, *Tropical Deforestation*, p. 79.

⁷¹ Rudel, *Tropical Deforestation*, p. 83.

Nonetheless, migrants and Indians alike cut down the forest. Virtually all settlers aspired to become cattle producers. Through the early 1980s, they received government loans to expand livestock production. “In a typical case,” Rudel notes, “a colonist cleared about 2 hectares of land per year until 1974, when he received a loan. Over the next two years, he cleared 16 hectares, then returned to the original pattern.”⁷² Most of the Upano Valley and adjacent areas were quickly deforested.

Surprisingly, perhaps, the Shuar (and eventually Achuar) adopted similar production strategies. Beginning in the early 1960s, the Salesians persuaded indigenous leaders that cattle production was their best defense against encroachment. They lent cattle to native communities. “In the early 1970s,” Rudel writes, “the federation, using funds donated by European development agencies, began making loans to Shuar *centros* for the development of their cattle herds.”⁷³ The 1973 Agrarian Reform Law cemented this pattern in place.

The consequences for native society were significant and far-reaching.⁷⁴ Most communities abandoned seasonal cultivation patterns and settled near airstrips or mission stations. They attended missionary schools and clinics. They cleared as much land as possible and planted pasture.⁷⁵ As their population approached 35,000 in 1990, they, too, became migrants – northward into Pastaza and Napo Provinces, along new roads in the northern *Oriente*.⁷⁶ Traditional communities – and relatively intact forests – remained only in eastern Morona Santiago, far from existing roads (Map 6).

Case 4: The remote frontier (No roads, oil or colonization)

Beyond these frontiers, Ecuador’s eastern rain forest has largely survived. Sporadic settlement has not brought significant change. In the late 19th and early 20th Centuries, Ecuadorian and Peruvian landowners created a string of *haciendas* down the Napo River as far as Iquitos. Many of the Quichua-speaking “cooperatives” that received land after 1973 had their origins as laborers on these *haciendas*.

The economic decline of Iquitos and the 1941 border war with Peru put an end to settlement there, and to date, eastern Pastaza and Morona Santiago Provinces remain relatively unchanged. In 1984, Petroecuador explored for oil along the Peruvian border, but abandoned these efforts shortly thereafter.⁷⁷ Periodically, it has also tried to interest foreign oil companies in developing heavy oil reserves near Nuevo Rocafuerte, but so far with little success.

Ominously, Petroecuador has also drilled several exploration wells in the Cuyabeno Wildlife Reserve and has begun to build production facilities in a protected forest adjacent to the Reserve. For now, however, these areas appear to be safe from large-scale deforestation, since most rivers flow from the Andean foothills toward the Amazonian interior, making illegal logging uneconomic for Ecuadorians (Map 7).

⁷² Rudel, *Tropical Deforestation*, p. 120.

⁷³ Rudel, *Tropical Deforestation*, p. 82; see also Salazar, “Federación Shuar,” p. 602.

⁷⁴ These events have been extensively discussed by Rudel, *Topical Deforestation*; Salazar, “Federación Shuar”; Salazar, “Settlement”; and Taylor, “God-Wealth.”

⁷⁵ According to Rudel, by 1983, only 7.1% of Shuar land in the Upano Valley remained forested. In 1977-78, Descola observed that several Shuar communities in the Upano Valley had given up growing their own food and bought it from merchants. See Descola “Settlement,” p. 640.

⁷⁶ According to the 2000 census, their population had reached 52,700. See Instituto Nacional de Estadística y Censos, *Censo de Población y Vivienda*, Quito: INEC, 2001.

⁷⁷ Martz, *Politics and Petroleum*, p. 365.

Conclusions

Colonization in the Ecuador occurred wherever roads were built. Before 1971, four major highways extended into the *Oriente*: Quito-Baeza; Ambato-Puyo-Tena; Cuenca-Limón-Méndez; and Loja-Zamora.⁷⁸ Initially, most migrants (around 30,000) moved into the country's southern regions, where transportation was better; only 10,000 settled in Napo Province.

But these trends changed after 1971, when the highway from Quito to Lago Agrio was completed. Between 1974 and 1976, the number of people living in Napo Province rose from 62,000 to 86,000; by 1982, it had increased again to 115,000; and in 1992, it reached over 370,000.⁷⁹ Since then, population in this area has remained roughly stable – meaning that 120,000 former residents and younger people who were born there have moved away.

Between 1964 and 1994, IERAC gave almost 5 million hectares to landless farmers and homesteaders throughout Ecuador; two-thirds of this land was located in the Amazon region.⁸⁰ In 1994, with no additional vacant lands remaining, the “frontier” was officially closed and IERAC was replaced by a conventional development agency, the *Instituto Nacional de Desarrollo Agrario* (INDA, the National Institute for Agricultural Development).⁸¹

What did government officials know about the impact of colonization and when did they know it? The evidence is clear. Beginning in 1963, various agencies collected soil samples, hydrological data and other information to determine where settlement should occur.⁸² This information was largely ignored in subsequent colonization schemes:

In 1987, [the Ministry of Agriculture and Livestock] completed an evaluation of 5.30 million hectares in northeastern Ecuador. The conclusion was reached that only 17 percent of the region (0.90 million hectares) was suitable for crop production and that forests should be maintained on the remaining 83 percent. When the evaluation was carried out, 1.10 million hectares had already been colonized.⁸³

⁷⁸ Uquillas, "Colonización y asentamientos espontáneos," p. 365.

⁷⁹ Hicks, et al., *Ecuador's Amazon Region*, p. 2; INEC, *Censo*, 1990. For a fascinating representation of population growth in the *Oriente*, see Lawrence A. Brown et al., “Urban-System Evolution in Frontier Settings,” *Geographic Review*, Vol. 84, No. 3, 1994, p. 255. Government colonization policy – including road construction – is well-documented in official reports. For examples, see IERAC, *La regionalización para la reforma agraria*, 1976; Instituto Ecuatoriano de Reforma Agraria y Colonización, “Políticas de acción de la reforma agraria,” Quito, 1979; Barral, “Poblamiento”; IERAC, “La colonización en el Ecuador,” Quito: IERAC 1984; and Pierre Gondard et al., *Transformaciones agrarias*; Oswaldo Barsky et al., *Políticas agrarias*; Baldemar Alava et al., *Las zonas socioeconómicas actualmente homogéneas de la Región Amazonica Ecuatoriana*, Quito: ILDIS, 1980. An overall assessment of land reform and its impact on smallholders can be found in Fausto Jordan Bucheli, *El minifundio. Su evolución en el Ecuador*. Quito: Corporación Editora Nacional, 1988.

⁸⁰ Lucy Ruíz, *Amazonia ecuatoriana*, p. 70; Trujillo “Colonización,” p. 20.

⁸¹ Official policy was reaffirmed periodically and remained almost unchanged until the end. Civilian governments eventually restored IERAC as the lead agency in managing colonization. For example, see IERAC, *La colonización en el Ecuador*, 1984, p. 8.

⁸² JNPC, *Colonización*; IERAC, *La regionalización* (1976); see also World Bank, *Ecuador. Development Problems*, pp. 188-189.

⁸³ Douglas Southgate and Morris Whitaker, *Economic Progress and the Environment: One Developing Country's Policy Crisis*, New York: Oxford University Press, 1994, p. 38.

As we know, most of this land became pasture. Between 1972 and 1989, as crop lands in the *Oriente* grew from 30,000 hectares to 135,000 hectares, pasture lands increased from 384,000 hectares to 880,000 hectares.⁸⁴

Similar events took place in other parts of Ecuador. Along the Pacific Coast, for example, another half-million hectares of intact forest were cut down. Rudel notes an “underlying similarity” among colonization zones:

Timber companies played a significant role in clearing land along Ecuador’s northern coast, but smallholders working in corridors along highways have cleared the most land. Oil companies triggered deforestation in the northern Oriente when they constructed roads...but colonists working small tracts of land along the roads have cleared the most land...Smallholders have cleared almost all of the land in the southern Oriente. ..⁸⁵

In all three regions, he continues, “Smallholders predominate, and an intense competition for land between colonists and indigenous peoples characterizes local politics.”

Most smallholders intended to raise cattle. Until the mid-1980s, livestock producers received government subsidies and loans – either directly, through the Banco Nacional de Fomento, or indirectly, through the subsidized price of fuel. In many areas, homesteaders had little choice about alternative crops: they could only receive legal title by clearing half their land and pasture was their best option. As we know, similar results occurred throughout the *Oriente*.⁸⁶

Did colonization address Ecuador’s need for food? Early research suggests that it did not. According to the Ministry of Agriculture and Livestock, basic food production in Ecuador declined by 260% during the “land rush” years of 1972-82. Meanwhile, pasture lands increased twenty-fold, displacing thousands of rural families.⁸⁷ Between 1975 and 1980, net rural employment declined by 125,000 workers (10% of the agricultural work force) – creating more landless peasants who migrated into the forest.⁸⁸

Returning to our initial question, which explanation for deforestation and violation of native land rights best accounts for these long-term changes in Ecuadorian society? Here are the essential facts:

- Beginning in 1875, Ecuadorian administrations have regarded native territories in the Amazon as “vacant land.” As early as 1900, highland migrants were allowed to settle on such “unclaimed land” in Morona Santiago. A second wave of settlement occurred in Pastaza and Napo Provinces after 1947, when Shell built its road from Ambato to Puyo. As a result, lowland Quichua (Runa) communities from around Puyo were displaced northward into Napo Province beyond the first agricultural frontier.

⁸⁴ Southgate and Whitaker, *Economic Progress*, p. 36.

⁸⁵ Rudel, *Tropical Deforestation*, pp. 44-46. See also Barral, “Poblamiento”; Barsky, *Políticas agrarias*.

⁸⁶ This process is described in Rudel, *Tropical Deforestation*; Eberhart, *Transformaciones agrarias*; Hiraoka and Yamamoto, “Agricultural Development”; as well as in other sources.

⁸⁷ Vos, “Petróleo,” pp. 22-35.

⁸⁸ Writing in the CEDIG report (1988), Jorge Trujillo draws this conclusion: “Although one goal of public policy on colonization has been to organize agricultural production for the internal market, achievements in this field have been limited. The fragility of tropical ecosystems, the uneven suitability of soils for developing intensive agriculture and the lack of appropriate technology to manage tropical resources and soils have ensured instead that settlement in these areas has taken place with high socioeconomic costs.” See Jorge Trujillo, “La colonización en el Ecuador,” in Pierre Grenard et al, *Transformaciones agrarias*, p. 60.

- Since 1920, the Ecuadorian government intended to use oil roads for settlement in the Amazonian lowlands. Beginning in 1971, it required foreign companies to build roads, airports and other infrastructure that was needed primarily for colonization, not for petroleum production.
- In 1964, Ecuador's military government decided to expand agricultural production and create "living borders" as a defense against Peru. It redoubled an earlier program to colonize the country's northwest coastal region and supported a major road project in Morona Santiago.
- The 1964 Agrarian Reform Law reaffirmed that most land in the Amazon was unoccupied and thus open to settlement. Over the next decade, settlers poured into traditional Shuar and Achuar territories, where they cut down existing forest and planted pasture. To protect their lands and qualify for legal title, many indigenous communities adopted the same production strategy.
- In 1972, the Petroecuador-Texaco Consortium completed a road from Quito into the northern *Oriente*. Within 20 years, 300,000 settlers moved into this area. In most cases, they cut down the forest and raised cattle.
- Until the mid-1980s, when it ran out of money, the Ecuadorian government used its new-found petroleum revenues to provide low-cost loans and other incentives for colonization. These incentives were channeled disproportionately to livestock producers.
- In all, more than 2 million hectares of Amazonians rain forest (out of 11.56 million hectares) has been cleared since 1965. Deforestation has occurred overwhelmingly in areas where roads were built – whether or not these roads were used to produce oil (Table 2).⁸⁹

Table 2: Deforestation by Province, 1965-2000			
PROVINCE	AREA (hectares)	Deforestation	
		Hectares	% of Province
Sucumbios	1,794,700	267,000	14.9
Orellana	2,169,100	404,700	18.7
Napo	1,247,600	421,300	33.8
Pastaza	2,906,800	222,800	7.7
Morona Santiago	2,387,500	601,200	25.2
Zamora Chinchipe	1,055,600	236,900	22.4
TOTAL	11,561,300	2,153,900	18.6 (total)

Clearly, the Ecuadorian government itself was responsible for these outcomes. Petroleum companies were not involved in setting agrarian policy, adjudicating land claims, or opening the Amazon to outside settlement. Oil production facilities occupied only a small fraction of this area.⁹⁰

⁸⁹ B.T. Orellana, "Avance de La Deforestacion de Los Bosques Amazónicos del Ecuador," *Proceedings of Monitoreo de la cobertura vegetal de la Amazonía* (Monitoring the Amazon Vegetation Cover), Quito July 19 - 20, 2007.

⁹⁰ For example, Texpet used only 4,415 hectares for oil wells and other production facilities.

Nor can government officials argue that deforestation and dispossession occurred as “unintended” consequences of well-intentioned development policy. By the early 1960s, before major damage had been done, Salesian and other missionaries had provided clear warnings about such consequences; these were soon followed by a raft of international experts in Ecuador and elsewhere. Throughout the 1970s and 1980s, reports of ecological damage and land rights violations accumulated in IERAC’s archives.⁹¹

Only one reasonable conclusion remains: Ecuadorian officials viewed environmental destruction and loss of native lands as an inevitable cost of development. Throughout the 1980s, they were certainly aware of what was happening and did little to stop it. Only the rise of an indigenous political movement in the 1990s seems to have deflected them. Still, the last chapter of this story has not yet been written. One can only hope for a better ending.

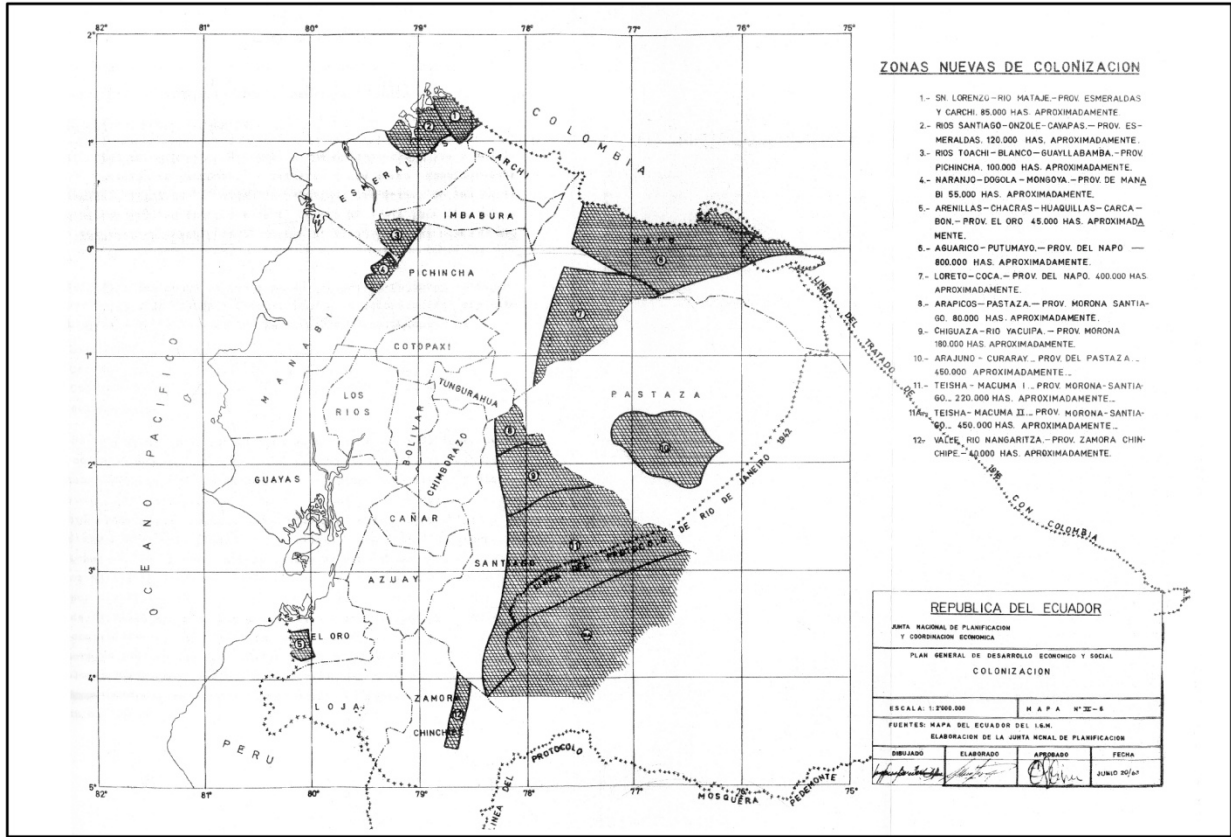
Date: August 3, 2010

⁹¹ Several have already been cited. Others include Henri Barral et al., “Reflexiones acerca del estado actual y del provenir de la colonización del nor-oriente,” Quito: MAG-ORSTOM, 1976; H. Barral and C. Orrego, “Informe sobre la Colonización en la Provincia del Napo y las Transformaciones en las Sociedades Indígenas,” Quito: MAG-ORSTOM, 1978; Henri Barral, “La región amazónica ecuatoriana,” Quito: Centro Ecuatoriano de Investigación Geográfica, Documentos de Investigación No. 3, 1983. Another important work is James F. Hicks, ed., *Ecuador’s Amazon Region. Development Issues and Options*, Washington: World Bank, Discussion Paper 75, 1990.

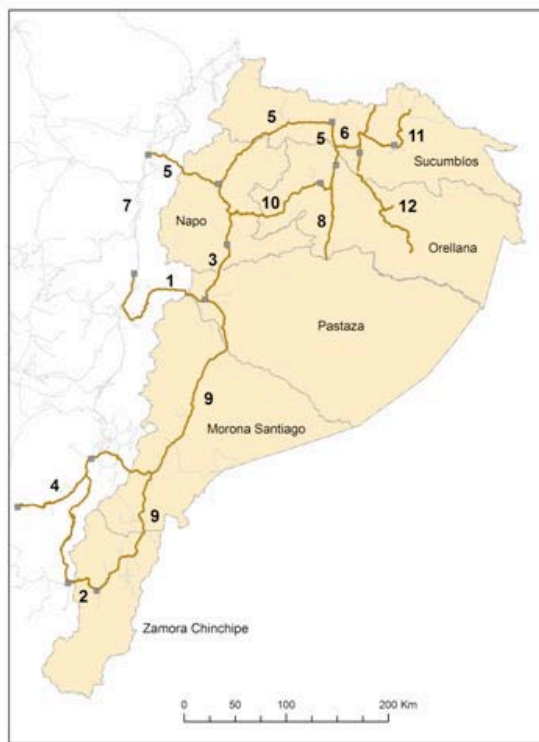
Map 1: Ecuador
 (original Texpet oil production area shown in green)



Map 2: Designated Colonization Zones, 1963



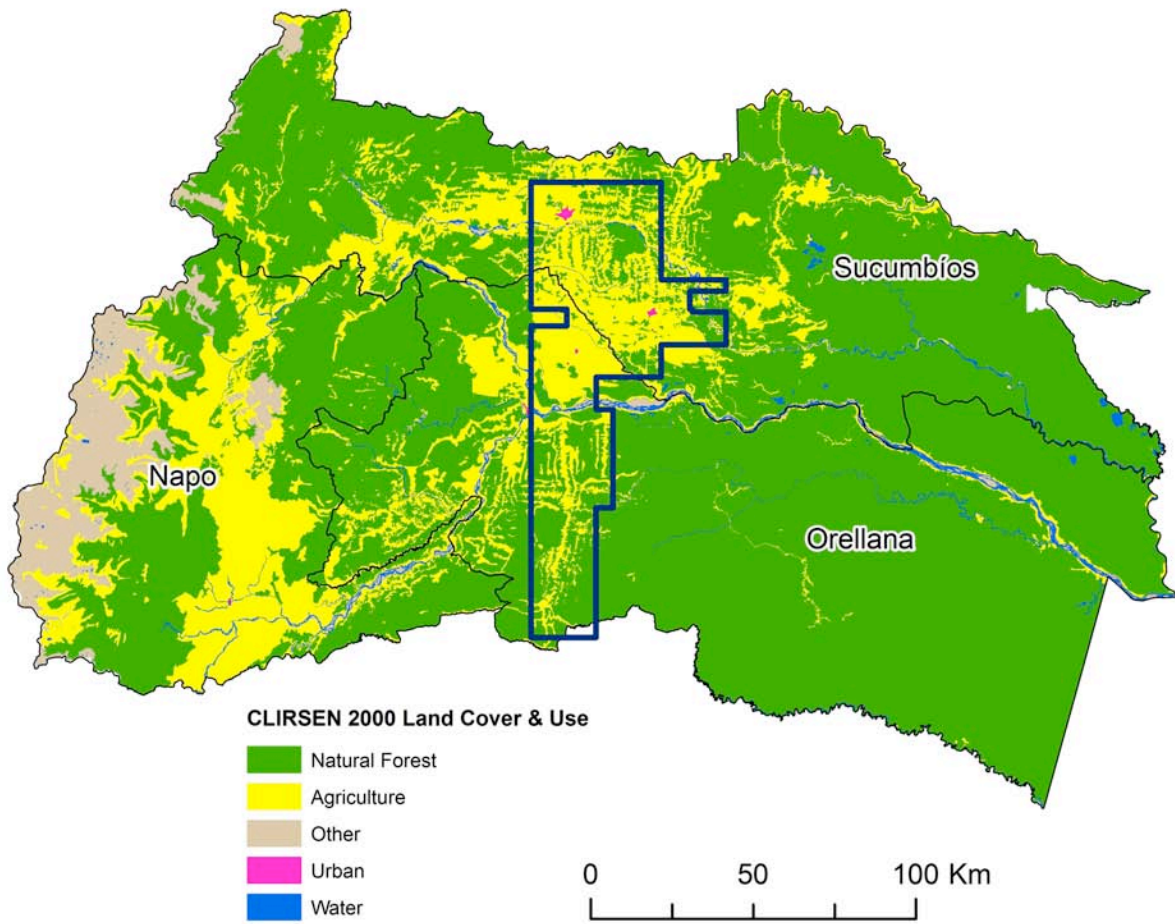
Map 3: Highway Construction in the *Oriente*



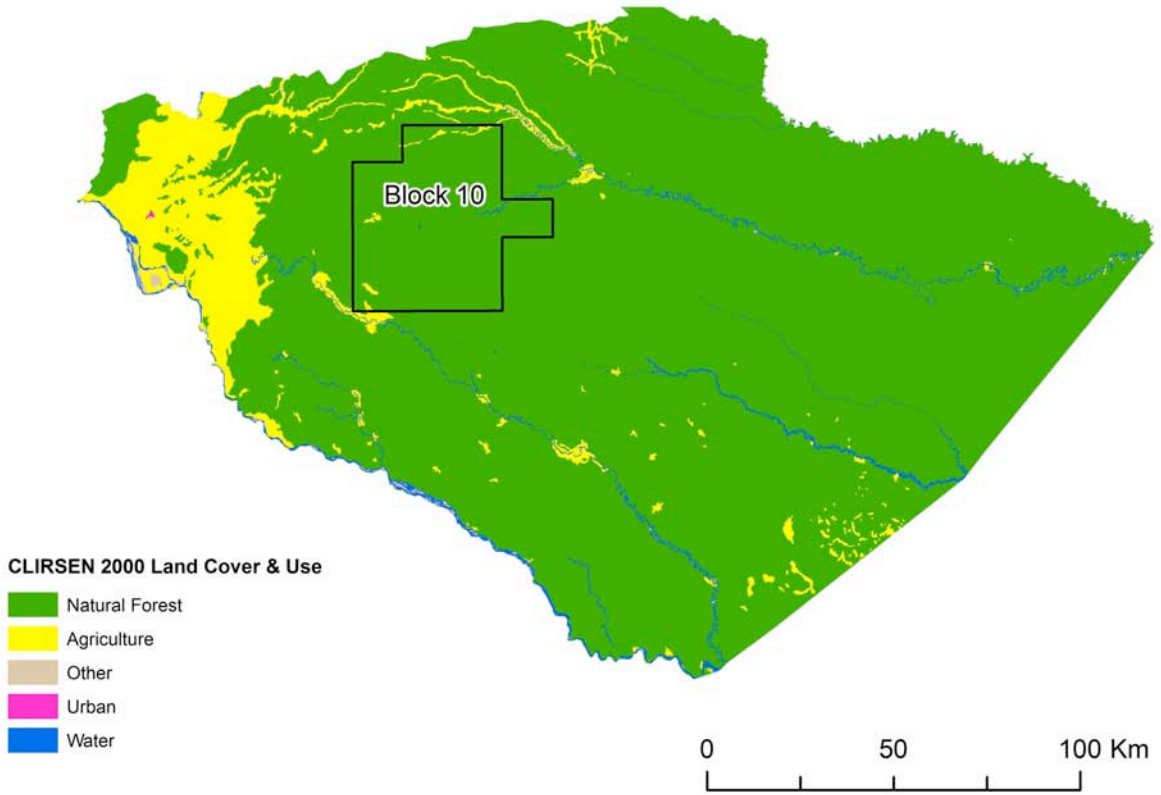
	Route	Built by	Completed in
1	Ambato to Puyo	Shell	1947
2	Loja to Zamora	Government of Ecuador	1960
3	Tena to Puyo	Shell	1950
4	Cuenca to Limon	CREA*	1970
5	Quito to Lago Agrio and Coca	Petroecuador- Texaco	1971
6	Sacha to Shushufindi	Petroecuador- Texaco	pre-1973
7	Puyo to Quito	CREA*	pre-1976
8	Sacha to Cononaco	Petroecuador- Texaco	pre-1984
9	Zamora to Puyo, Tena to Baeza	CREA*	1982-1987
10	Coca to Tena	Government of Ecuador	1988
11	Tarapoa to the Río San Miguel (through the Cuyabeno Reserve)	Government of Ecuador	1980's
12	Block 16	Maxus	1994

*CREA was a regional development authority in the southern highlands

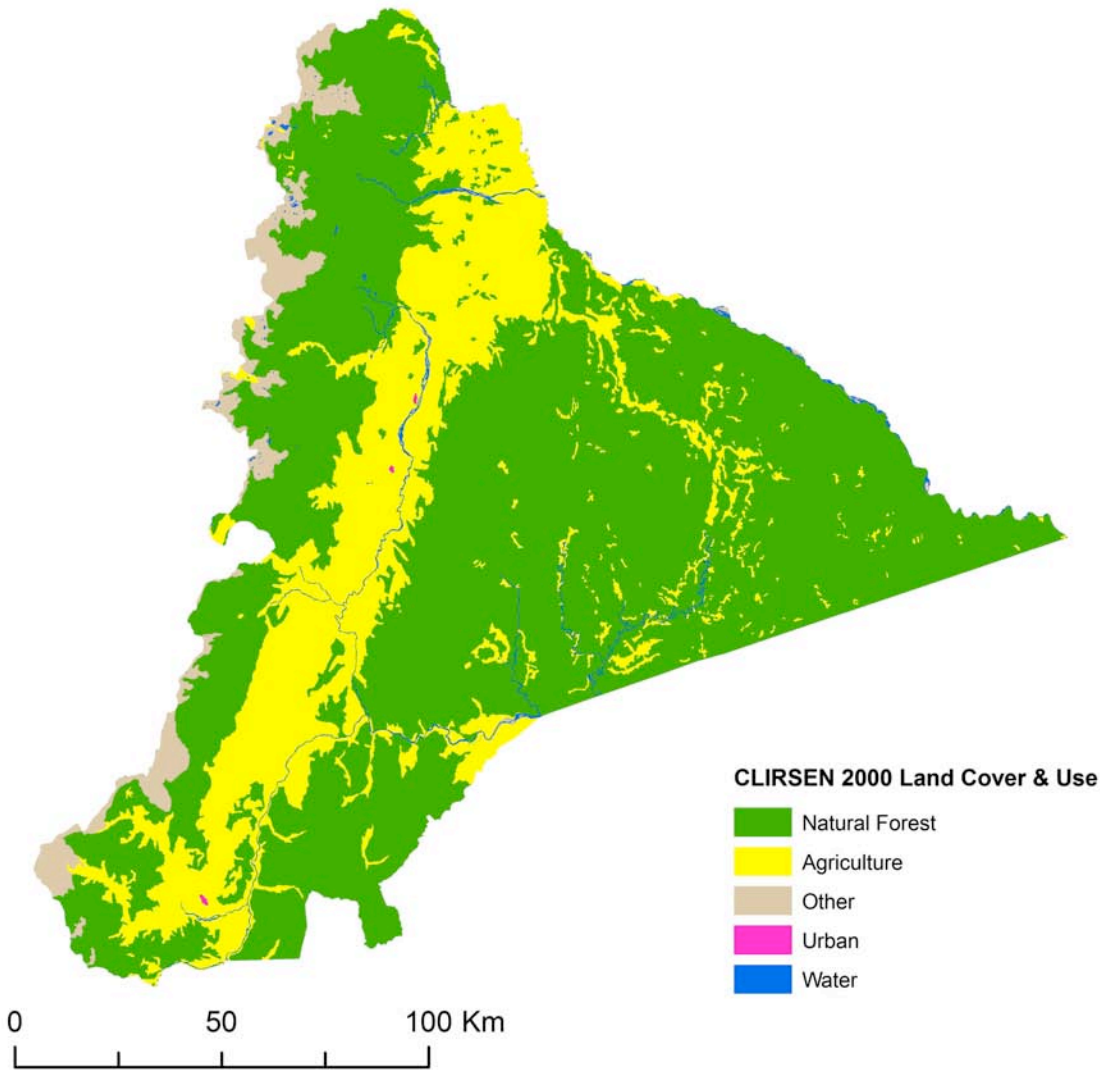
Map 4: Land Use in Sucumbíos, Orellana and Napo Provinces, 2000



Map 5: Land Use in Pastaza Province, 2000



Map 6: Land Use in Morona Santiago Province, 2000



Map 7: Deforestation in the *Oriente*, 1965-2000

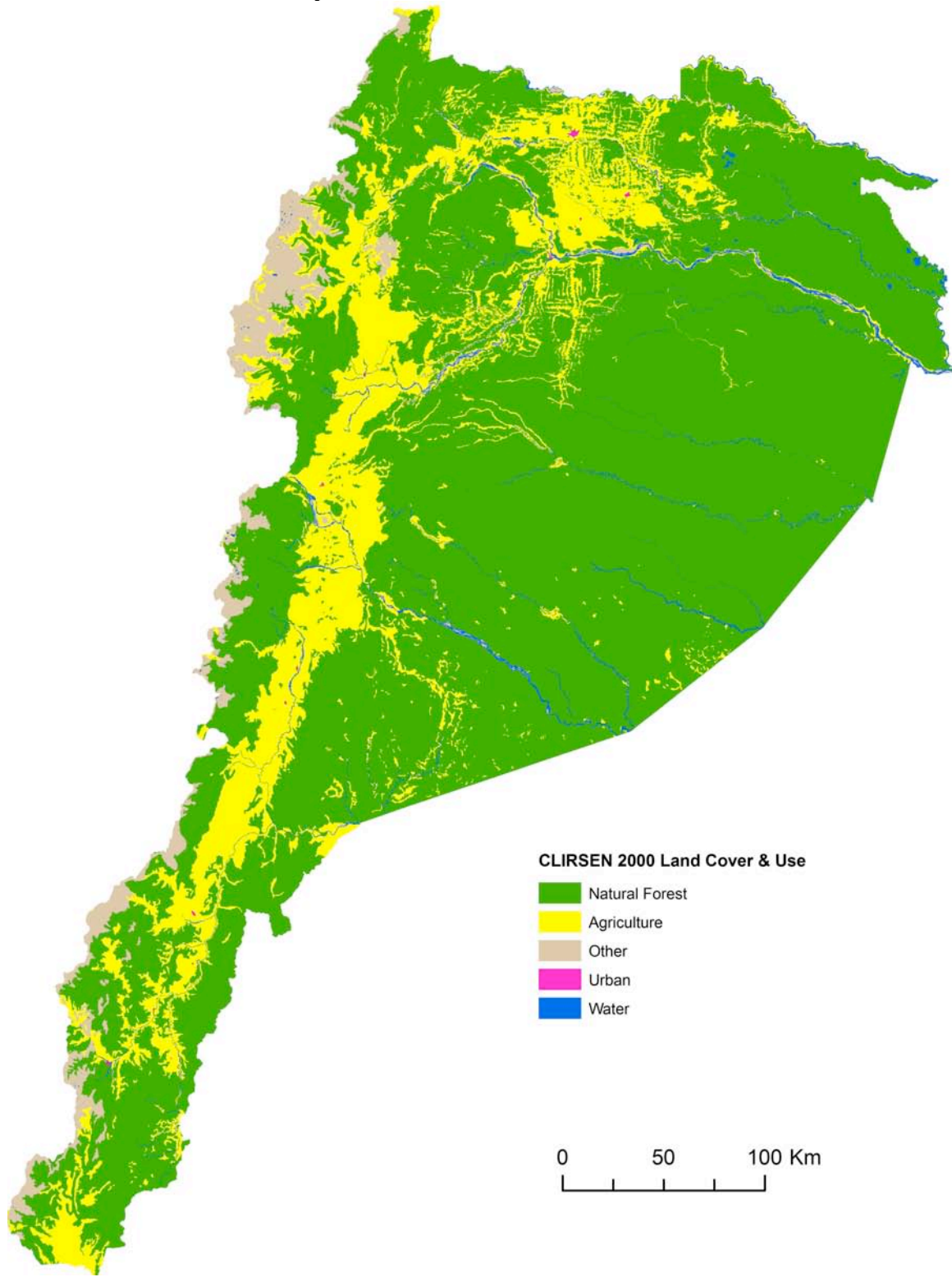


Figure: Land Reform and Colonization, 1964-1978
(Source: Luzuriaga and Zuvekas, *Income Distribution*, p. 168)

