

ECUADOR'S TROPICAL FOREST FRONTIERS: SOME HISTORICAL AND RECENT ASPECTS OF SETTLEMENT AND AGRICULTURAL EXPANSION

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Introduction

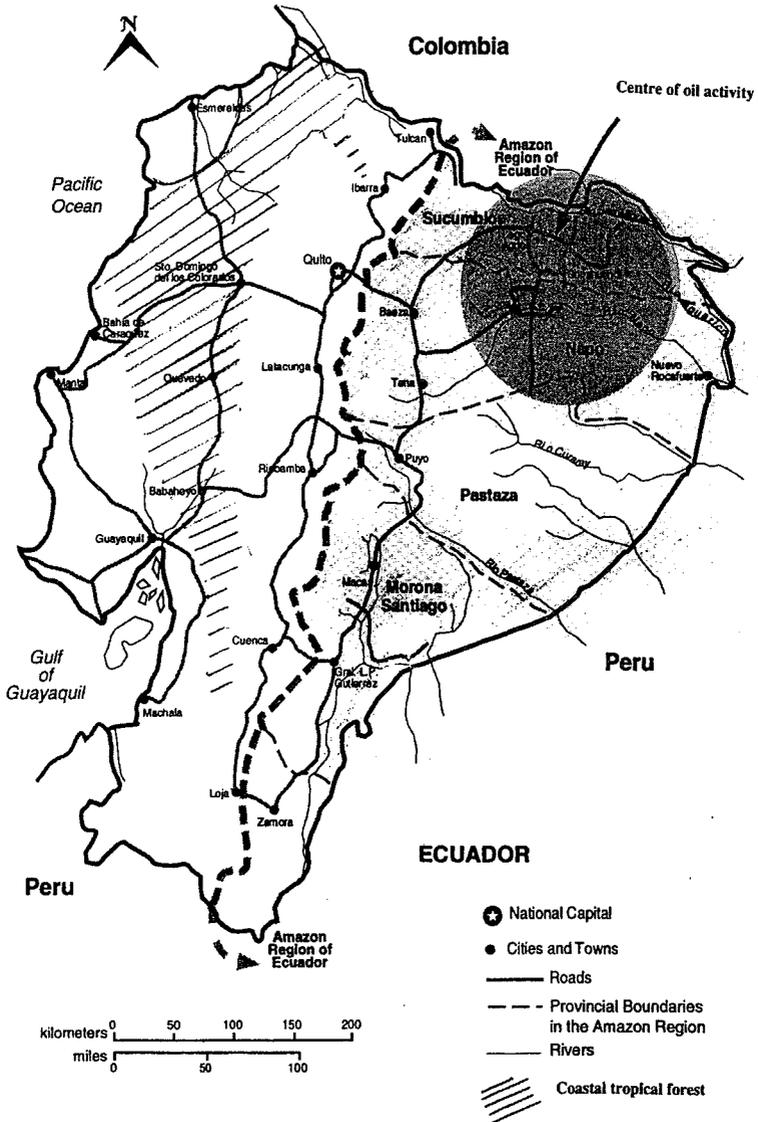
The expansion of the agricultural frontier into tropical forests in Latin America is frequently seen as a monolithic process which is similarly occurring across countries in the region, particularly within the Amazon Basin. Differences in frontier dynamics within the region have not been extensively explored. A better understanding of the processes and patterns which continue to shape the development and use of Latin America's tropical forests, however, requires a better understanding of the different as well as similar forces affecting them. Discussion below responds to this need by considering the different patterns of agricultural expansion which have characterised tropical forest regions *within* one country, Ecuador.

Ecuador is often described as an Andean country, but like many other South American nations whose post-colonial history has unfolded primarily in the highlands, it also encompasses significant areas of tropical forest. Ecuador, in fact, contains two tropical forest regions or 'frontiers' which have been subject to agricultural expansion and settlement¹. These regions include (1) coastal tropical forests to the west of the Andes which border on the Pacific Ocean and (2) a much vaster Amazon tropical forest area to the east of the Andes which has recently become a major oil-producing centre in recent decades (see Figure 1). Given these two distinct tropical forest regions, we ask the question, "What are the common as well as differing factors which have shaped agricultural expansion in them?" Discussion below compares and contrasts some of the macro-level structural and policy-related factors which have historically affected agricultural frontier expansion in Ecuador's two tropical forest region. We build upon previous detailed historical reviews (especially Bromley, 1981; Pichón, 1992; Rudel, 1993; Trujillo, 1988; and Uquillas, 1984), but aim to undertake more extensive comparative consideration between coastal and Amazon areas than has previously occurred.

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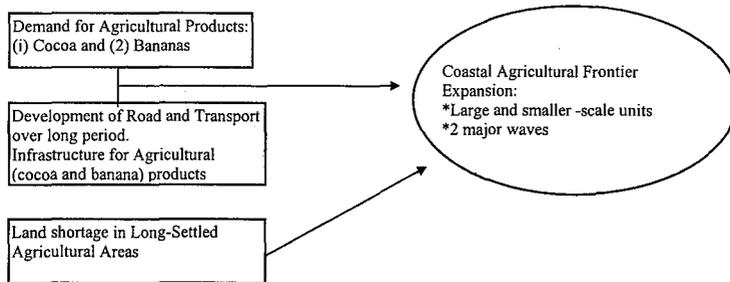
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Figure 1.



The Settlement of Ecuador's coastal lowlands

Figure 2 - MAJOR FACTORS SHAPING FRONTIER EXPANSION IN COASTAL TROPICAL FOREST REGIONS OF ECUADOR



Economic booms based on world demands for tropical agricultural products, namely cocoa and bananas, and the growing road and transport networks developed to meet this demand have historically played the most important role in the settlement of Ecuador's coastal tropical forest areas (Bromley, 1981; Hamerly, 1970 as quoted in Bromley 1981) (Figure 2).

For most of the 19th century, Ecuador was the world's largest exporter of cocoa. From this time until the 1920s, cocoa cultivation spread progressively northward from the area around Guayaquil into tropical forests which lay northward. Following the spread of cocoa production, population also tended to spread north and westward moving out from more long-settled areas in southern coastal areas closer to Guayaquil. The expansion of cocoa cultivation into coastal tropical forests occurred mainly through large-scale plantation agriculture. Cocoa was generally produced in the coastal region on large semi-feudal *haciendas* which often covered hundreds or thousands of hectares and were owned by absentee landlords. Although smaller scale agricultural activity did eventually increase in coastal tropical forest areas (discussed further below), coastal areas have subsequently reflected a greater mixture of both large- and smaller-scale agricultural activity than has the Ecuadorian Amazon frontier.

During the 1920s, a combination of crop disease and changes in world markets led to the 'cocoa bust' or a sharp and lasting decline in cocoa demand and production. Many of the large cocoa-producing *haciendas* in coastal areas were subsequently subdivided into medium and small-size farms which grew new crops other than cocoa. For example, areas around Quevedo were gradually occupied by small-scale farmers involved in the cultivation of sugar cane and the production of cane by-products such as *panela*, an unrefined sugar, or *aguardiente*, an alcoholic

cane spirit, (Bromley, 1981). Former cocoa-producing southern and central coastal areas closest to the Andean outer-slopes converted to smaller-scale orange and coffee growing rather than sugar cane production subsequent to the cocoa bust (Bromley, 1981). These regions remain the main production centres for these products in Ecuador to this day.

The 1930s or the decade following the end of the cocoa boom was a time of reduced frontier settlement activity in the coastal lowlands. After the Second World War, however, there was a marked growth in world demand for tropical forest products such as bananas. This increased demand, coupled with the expansion of the country's road network, triggered Ecuador's banana boom and a new phase of frontier expansion into coastal tropical forests which was driven by banana cultivation. During the 1950s and 1960s, banana production as well as population settlement expanded even further northward than cocoa production had done into coastal tropical forest areas around Quevedo and Santo Domingo as well as southward toward Machala (See Figure 1).

Small banana-exporting zones also opened up in northern coastal forest areas around Esmeraldas and east of Santa Domingo (Bromley, 1981). Although large international companies largely drove this expansion, they frequently used 'out-growing' schemes in which medium- to small-scale farmers grew bananas in exchange for seeds, and assistance (Gondard et al., 1988:76). With the banana boom, smaller-scale production therefore probably continued to increase somewhat in prevalence on the coastal agricultural frontier, especially when compared to the plantation-dominated cocoa boom era.

The banana boom which continued through the 1950s and early 1960s allowed the Ecuadorian government and local authorities to finance construction of paved highways between the major towns of the coastal lowlands, and between the Andean highlands and several coastal ports. The pace and location of road construction had a major influence on the opening of new frontier areas in the coastal lowlands, particularly as road transport replaced river boats and coastal steamers as the principal means of movement in region (Trujillo, 1988; Bromley, 1981). Quevedo, for example, located at the junction of major paved highways running north-south and east-west, became the heart of coastal banana production and settlement in the 1950s and 1960s. At that time, new frontier farming areas continued to be established north and east from Quevedo. By the 1960s, no land within reasonable reach of Quevedo remained for agricultural expansion, and the main effort to open new areas focused even further northward in the area of Santo Domingo de los Colorados (Wood, 1972; Bromley, 1981) (see Figure 1). Construction of a railway link between

Quito and Esmeraldas in the north encouraged this extension of banana cultivation and settlement into these northern most tropical forest regions.

In the late 1960s and early 1970s, a banana 'bust' occurred as Ecuador's share of the world banana trade declined sharply due to both disease problems associated with the Gros Michel variety grown extensively in Ecuador and the emergence of competition from Central American banana-producing countries (Gondard et al., 1988:78ff). As a result, Quevedo's importance declined markedly in the mid-1960s. Santo Domingo, however, remained a rapidly growing settlement area serving Quito's and the northern highland's internal demand for bananas and other tropical products.

Ecuador's land reform program which began in 1964 aimed, among other things, to redistribute *hacienda* lands to smallholders. The impact of the land reform program in coastal regions was limited, however, since medium and smaller-sized farms rather than *haciendas* already predominated in coastal regions by the 1960s (Trujillo 1988). The banana bust in the 1970s, however, triggered major shifts in land use patterns and led to increased diversification in the crops grown in the coast in general. By the 1980s, two thirds of all productive areas in the coast were involved in pasture and cattle raising while approximately only a third was relegated to agricultural production (Gondard et al., 1988:80). Although bananas continue to be grown (especially in the south-west coastal areas), by the 1980s they occupied only a small portion of total cultivated areas (approximately 6 per cent), coffee and cocoa occupied the largest portion (25 per cent each), and maize, rice, plantain, sugar cane, African Palm, and cotton had also become important (Ibid.:80, Cuadro 6). The production of coffee on the coast has continued to involve mainly medium and smaller-scale producers (Ibid.:85).

The main stimulus to continuing, although more geographically limited, human settlement of humid tropical areas in the coastal regions today is mainly the "push" of landlessness and rising unemployment in long-settled areas of the region, rather than the "pull" of any agricultural product boom. Ecuador's national population has increased from 6.5 million people in 1974 to nearly 10 million in 1990 (CEPAR 1993:47, Cuadro D-1A). This growth has steadily contributed to increasing pressure on limited (and unevenly-distributed) agricultural lands in both the highlands and more densely settled southern coastal areas which in turn has pushed some farmers towards remaining tropical coastal forests.

Since the late 1960s, however, rural migrants from densely settled southern coastal areas as well as the Andean highlands of the country have been drawn to an alternative frontier, the Amazon to the East. In contrast

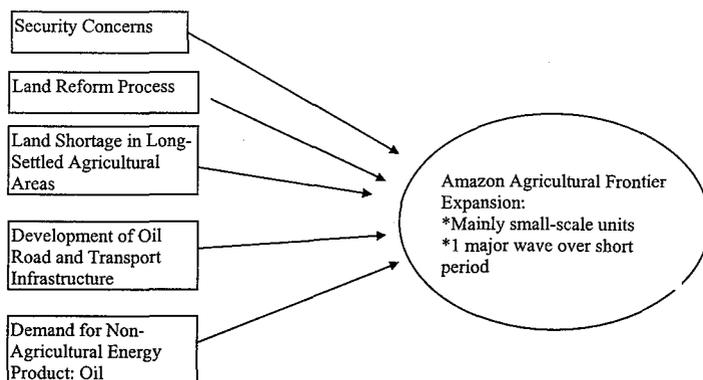
to the longer time frame in which agricultural expansion into coastal tropical forest areas occurred, settlement of the Ecuadorian Amazon has proceeded rapidly over the last three decades and currently continues to occur on a significant scale. We now turn our attention to the trends which have and continue to shape Ecuador's other tropical forest frontier, the Amazon, particularly the north-eastern portion which has become the epicentre of oil development (see Figure 1)².

The Settlement of the Ecuadorian Amazon With Emphasis on the Northeast

A major difference in the dynamics of agricultural expansion in Ecuador's Amazon as compared to coastal tropical forest regions centres on the insignificant role played by agricultural forest products in the latter. Historically, agricultural product booms have not played as great a role in agricultural expansion into the Ecuadorian Amazon as they have in coastal regions of Ecuador. This lack of any major agricultural product boom in the Ecuadorian Amazon, moreover, distinguishes it from the Amazon regions of other Amazon basin countries as well. For example, the economic booms for quinine and rubber which occurred in the Bolivian, Brazilian, and Peruvian Amazon during the 19th and early 20th centuries largely by-passed Ecuador's Amazon since Ecuador's Amazon rainforests did not contain sufficiently dense stands of the quinine-producing cinchona or rubber trees to attract large scale activity (Trujillo, 1987 and 1988, Uquillas, 1984 and 1987, Bromley 1981).

In contrast to coastal tropical forest areas where the external demand for agricultural products was a key force, frontier expansion into Ecuador's Amazon region this century has been driven by a wider array of primarily non-agriculturally-related factors (Figure 3). Armed international conflict, and security rather than direct economic concerns, led to the first wave of settlement in Ecuador's Amazon region. A territorial war between Ecuador and Peru in 1941 and the subsequent Rio de Janeiro Protocol of 1942, led to the *de facto* loss of a large area of the Ecuadorian Amazon to Peru (amounting to about a third of Ecuador's entire territory). After the Protocol, military settlements were subsequently set up by the Ecuadorian government on the remoter eastern forest areas of the remaining Ecuadorian Amazon as a security measure. The population of these remote settlements, however, never exceeded a total of five to ten thousand people (Bromley, 1972 and 1981, Wesche, 1967 as quoted in Bromely 1981).

Figure 3 - MAJOR FACTORS SHAPING FRONTIER EXPANSION IN AMAZON TROPICAL FOREST REGIONS OF ECUADOR



In contrast to coastal areas, Ecuador's agrarian reform program did have significant impacts on settlement and agricultural expansion in the Ecuadorian Amazon. As noted above, Ecuador's land reform process, which began in 1964 and continued through the 1970s, tackled a number of pressing issues, including the potentially serious political problems arising from the agrarian structure based on the old patronised system of *haciendas*. The agrarian reform process split up some of the country's large haciendas which were concentrated in the Andean region, turning this land over to small-scale and indigenous farmers. Like former *haciendas*, Amazon territories were also classified as public or unoccupied public lands (*tierras baldías*) available for redistribution within the land reform process (Trujillo, 1988). Land reform thus marked the start of an official policy of actively encouraging settlement of the Amazon. Additionally land reform measures also reinforced the small-scale farm as a central element of domestic agricultural production in the highlands as well as on the Amazon frontier³. Due to its dual focus on redistributing lands in both the highlands and Amazon frontier, the land reform process was institutionalised in 1964 through the establishment of the Ecuadorian Institute for Agrarian Reform and Colonisation (IERAC, the government land adjudication agency). Working primarily through IERAC as well as several other organisation created for the purpose, the Ecuadorian government supported the idea of planned colonisation schemes in the Amazon.

In general, however, the government's planned settlement schemes in the region never significantly developed.

Meanwhile the spontaneous movement of people from the Andean highlands and coastal regions to the Amazon increasingly began to occur and the government shifted towards passively encouraging this process as opposed to active settlement schemes (Trujillo, 1988). After the process of land reform concluded in 1975, Ecuador's policy for settlement of the Amazon was based essentially upon the 1978 Law of Colonisation of the Amazon Region which still recognised the occupation of the Amazon as an urgent national priority (Hicks et al., 1990; Trujillo, 1988). However, government efforts were directed towards the *post facto* legalisation of land claims made by spontaneous settlers, accompanied, at least on paper, by some planning activity, land-use zoning to protect natural resources, and development of regional infrastructure (Uquillas, 1984). In reality, the latter three activities have not extensively occurred due to insufficient funding. Thus, despite the guiding provisions specified under the 1978 Colonisation Law, small farmers settlement and agricultural frontier expansion in the region has been "indirectly" driven by what has become the region's primary non-agricultural economic activity, oil extraction (Trujillo, 1988). We now turn to consider the impacts which oil development has had on agricultural frontier expansion in the Ecuadorian Amazon, particularly in the north-eastern portion.

Although agricultural product booms historically by-passed the Ecuadorian Amazon, the region has been transformed through an alternative boom for a major energy product, oil. The most rapid and large scale agricultural and demographic expansion into the Ecuadorian Amazon has occurred with the oil boom which began in the region in the 1970s and which continues to this day. Although exploration for oil began as early as the 1930s in the southern Ecuadorian Amazon, significant finds were only made in the north-eastern Ecuadorian Amazon in 1967 by Texaco-Gulf. The massive road-building programs designed to support oil development which followed (and still continue) made the Amazon accessible on a larger scale for the first time. Subsequently, 'spontaneous' settlers from all parts of the country, but particularly Andean and densely settled southern coastal regions, were attracted into the region. Concurrent droughts and floods in the Andean province of Loja and coastal province of Manabí made them particularly important points of out-migration to the Amazon.

Oil activity in the Amazon, and subsequently small-farmer settlement, and agricultural expansion, has mainly centred on two provinces in the Northeast, Napo and Sucumbios (Figure 1). These two north-eastern Amazon provinces make up the largest portion of Ecuador's

entire Amazon area, are the centre of migration flows into the region, and contain the largest part of its total population. Compared to the previous settlement patterns in the Amazon which concentrated along rivers, oil-boom settlement in Napo and Sucumbios has occurred mainly around roads constructed by the oil companies. Settlers not only enter the region on oil roads but also settle as near as possible to these roads accumulating in successive rows or *respaldos*.

As a result of in-migration between the 1960s and 1990s, population in north-eastern Ecuador (Napo and Sucumbios) increased from under 25,000 to over 200,000 people (CEPAR 1993:48-50, Cuadro D-1B). Since most of this population is also located in rural areas, most in-migrants are evidently small farmers. Many settler farming units are in fact comprised of individual families which move to the Amazon together. After migrating to the Amazon, these households subsequently convert forest to establish production systems similar to small-scale holders in coastal tropical forest areas which involve coffee growing and mixed farming of other subsistence crops (yucca, banana, maize) (Pichón 1996a; 1996b; 1996c; 1997a; 1997b). Plantation agriculture is currently limited in the region to some African Palm production around Shushufindi and smaller-scale farms, have become the most prevalent mode of agricultural production in the north-eastern Ecuadorian Amazon. By the 1990s, the North-eastern Ecuadorian Amazon had one of the highest estimated agricultural expansion rates in the Amazon Basin with approximately 2.0 per cent of existing forest converted each year (USAID/Quito, 1989; Southgate, 1992). Since the Northeast currently has no large-scale plantation agriculture activity (or timber extraction activity), forest conversion in the region is most closely linked with the process of oil-road construction, small-farmer in-migration, and their subsequent land-clearing activity

Discussion: Comparing the Past and Considering the Future

This brief review has attempted to provide a general profile of the major forces which have shaped agricultural expansion and settlement in Ecuador's two tropical forest frontiers. The picture presented is inevitably incomplete considering the time frame and range of phenomena involved and the reader is referred to more thorough historical accounts for greater detail (Bromley, 1981; Trujillo, 1987 and 1988; Uquillas, 1984 and 1987). We may, in an case, attempt to formulate some limited insights and conclusions based on the select historical review presented here.

The processes of settlement in Ecuador's coastal and north-eastern Amazon frontiers present several important similarities and differences as

comparison of Figures 2 and 3 suggest. The main common factor which has driven agricultural expansion in both Ecuador's coastal and Amazon tropical forest frontiers is land shortage in long-settled regions, namely the Andean highlands and southern coastal provinces. Also in both areas, direct spatial planning of settlement has been limited and roads built mainly for the exploitation and transport of export commodities (cocoa and bananas in coastal tropical forest areas and oil in the Amazon) have shaped the in-migration of farmers as well as their settlement patterns.

A striking difference is that agricultural product booms centring on exports of cocoa and bananas played an almost singular role in driving agricultural expansion into tropical forests on the coast. Agricultural expansion into Ecuador's Amazon region, in contrast, has been driven by a wider array of mainly non-agricultural factors (oil development, security concerns, land shortages in long-settled areas). The differential roles played by agricultural versus non-agricultural products in coastal and Amazon tropical forest areas has resulted in a distinctly different pace of development in each region. The successive cocoa and banana booms and agricultural expansion into Ecuador's coastal tropical forests spanned a century and a half. Major frontier expansion in the north-east Ecuadorian Amazon as the result of oil development activity has, in contrast, occurred over only three decades. Another difference between agricultural expansion in the two regions is that smaller-scale production has probably been more prevalent in the Amazon while in coastal tropical forests a greater mixture of smaller and larger-scale agricultural units exists.

As noted at the outset, agricultural frontier expansion, particularly into the Amazon, has frequently been treated as a monolithic process. Discussion above, in contrast, illustrates that frontier expansion and settlement processes vary even within individual countries. It also points to some important differences which may exist between countries. For example, the role played by smaller scale (even household) agricultural units in tropical forest frontiers in both coastal and Amazon regions in Ecuador may have been historically more important than in other Amazon basin countries. In Brazil for example, although small-scale farming has also occurred, larger scale agricultural, cattle, and timber activity have played comparatively greater roles than they have in either of Ecuador's tropical forest frontiers. Comparative exploration of differentials in frontier and agricultural expansion patterns within and between countries in Latin America remains an important area to be taken up in future research.

In this context, it is important to point to the limitations of the above discussion and to highlight areas for additional research. We have singled out some major common and distinct factors which have driven frontier

expansion in Ecuador in general terms (e.g. demands for export products, land reform, land shortage). In the future, better classification of the causal factors and characteristics of frontier settlement processes might be developed in considering agricultural expansion into tropical forests either within or between countries. Future analysis may for example, undertake more systematic and comparative classification and consideration of frontier expansion in terms of: the types of organisational forms of settlement which prevail (small or large scale, planned or unplanned), the pace of settlement (slow or rapid), levels of infrastructure and administrative development on the frontier, relative roles played by agricultural versus non-agricultural and extractive activities (e.g. mining, timber, military concerns), role played by export versus domestically aimed agricultural production, types of ecological impacts, and of course, the roles played by direct and in-direct government policies (e.g. settlement policies or land reform) in shaping different frontier settlement patterns.

The characterisation or classification of frontier areas according to such standard criteria might facilitate the development of some kind of 'typology' of tropical forest settlement dynamics in Latin America which was built on solid empirical knowledge of existing differentials rather than assumptions about common dynamics. Previous attempts at developing typologies of "colonisation" of tropical forest areas in Latin America have been infrequent and based on a limited range of criteria — e.g. the degree of development of settler productive regimes or degree of 'planning' and government direction (see Nelson, 1973; Morán, 1989).

A more fully developed typology or generalised understanding of frontier expansion processes in Latin America, based on a richer range of criteria and more extensive empirical comparison across as well as within countries, would offer a useful policy as well as research tool. Such a typology could provide policy-makers and planners with a better understanding of common as well as divergent trends. This may be particularly useful in the formulation of regional policies within the Amazon Basin which encompasses one ecosystem yet several different countries and varying economic, political, and national development dynamics. Such a more detailed understanding, is critical to shaping the future impacts which frontier processes will have on the natural as well as human resources which are found on Latin America's tropical forest frontiers.

Notes:

- 1 Ecuador's tropical forest 'frontiers' have in fact been occupied by numerous indigenous peoples since at least since pre-Colombian times. The Ecuadorian Amazon currently includes several groups of indigenous people with a total population estimated at anywhere from 90,000 to 180,000 (25 per cent to 50 per cent of the region's total population) (Kimmerling, 1991; Trujillo, 1988). The Quichua (mainly in the north-east) and Shuars (in the south) make up two thirds of the Amazon region's indigenous population while the remaining third consists of smaller peoples including the Huaorani, the Secoya and Siona, and the Cofán. The historical effects of frontier expansion on indigenous peoples in the Amazon is treated in detail by Trujillo (1988) and Uquillas (1992) and this important dimension of agricultural frontier expansion and its impacts is thus not specifically addressed here.
- 2 More detailed information on trends shaping the development of the southern Ecuadorian Amazon are reviewed in detail by Rudel (1993).
- 3 While frontier settlement is frequently depicted as an alternative to land reform, in the case of Ecuador frontier settlement was clearly conceived as an integral part, rather than as alternative or substitute for agrarian reform (Trujillo, 1988).

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