

Part II G4

Case Study: Central Peruvian Amazon a test case for desakota development in the Amazon

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The Amazon region has been affected by many of the same changes seen in other developing country areas of the world. Globalization of the world economy has changed the outlook for resource use. Demand for land has increased in a few areas, particularly the southern Amazon in Brazil and Santa Cruz state in Bolivia. Increasing global demands for soy beans, sugar cane and ethanol, African palm oil, beef, and other high-demand, globally traded commodities have been drivers of land and resources use change. Many areas of the Amazon have been opened up to development, and have been subject to in-migration.

Have these changes led to a new type of rural development, one driven by new forces reaching into previously isolated rural areas? Has the Amazon experienced desakota-style rural development as seen in parts of Asia – that is, blurred distinctions between rural and urban, mixed economies and land use, space-time reduction in interactions with other places? How has recent rural development affected ecosystem services and poverty alleviation?

The central Peruvian Amazon in the area surrounding the city of Pucallpa provides a test case for answering these questions. The region has been a hotspot of land use change and population growth since the middle of the last century. A major road corridor linking the river port city of Pucallpa with the mega-city, Lima, on the Pacific coast is similar to the Brazilian Amazon in which massive road construction linked the region to the populated center-south of Brazil.

Development in the Central Peruvian Amazon

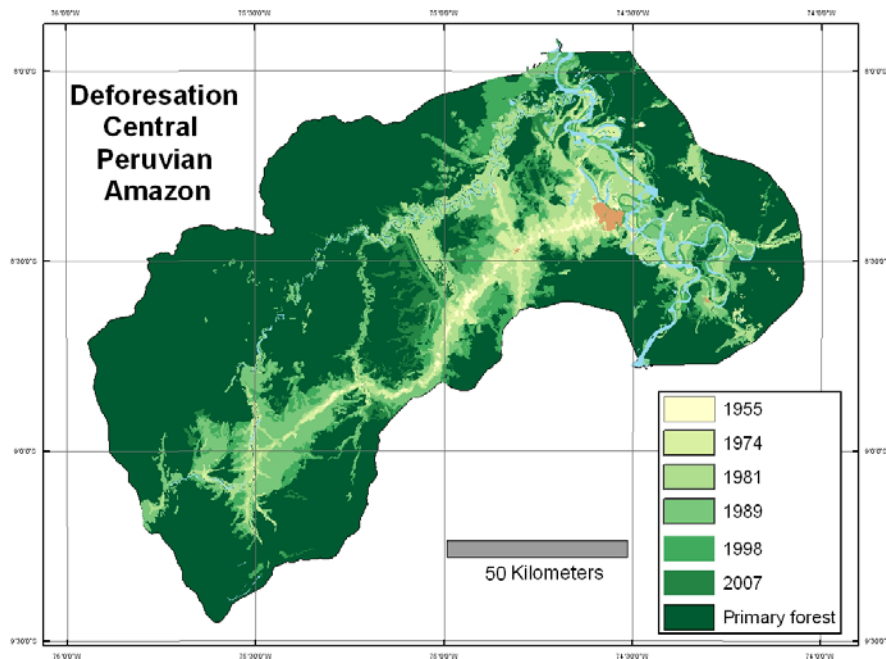
The population of the central Peruvian Amazon has increased from less than 50,000 persons before 1950 to more than 350,000 today. The urban population in the region was near zero in 1940, then with a rural population of 25,000 people. Around 1980 the number of people living in urban areas surpassed the rural population. Today, 72% of the population (274,000 persons) lives in urban areas and 28% live in rural areas (86,000). Most of the urban dwellers live in Pucallpa, the capital of the Department (State) of Ucayali, a transshipment point for goods switching from overland to river travel and vice versa; and a service center for economic activity in the surrounding hinterland.

The construction of the road between Lima and Pucallpa motivated initial development of the region between 1945 and 1970. The decade of the 1970s saw substantial migration and population growth into the area. During the 1980s government policy

sustained this growth. The region was viewed as a potential “breadbasket” for Peruvian development. This decade also saw the rise of coca cultivation in the *selva alta* area bordering the Andes mountains. The 1990s were marked by terrorism (by the leftist guerrilla group, the *Sendero Luminoso*) and continued growth of coca cultivation into the mid-1990s. This decade was also distinguished by the Fujimora administration’s reduction of agricultural support and credit to the region. Over the last several years, growth has continued, mostly without government policy support.

Development of the region spurred massive deforestation and changing land cover/land use (Figure 1). In the period before 1974, about 3,000 ha yr⁻¹ of forest was cleared. Deforestation rates shot up in the between 1974 and 1989, with rates near 20,000 ha yr⁻¹. Rates were reduced by half between in the 1990s, but continue to be substantial over last several years (Hyman et al., 2002; Swallow et al., 2007; Oliveira et al., 2007).

Figure 1. Deforestation in the Central Peruvian Amazon, 1955 to 2007



Development and desakota in the Central Peruvian Amazon

Does development in Central Peruvian Amazon fit the desakota model? If so, increasingly mixed land uses, mixed economic activity, development along inter-urban corridors, increased urban-rural interaction and associated technological impacts would all be expected.

A greater diversity of land covers and land uses has certainly developed over the last several decades. Inevitably, the high rate of deforestation in the region has led to mixed land cover and land use. Closed primary forest was reduced by 10 percent between 1990 and 2007 (Swallow et al., 2007). A mosaic land cover of shifting cultivation took its place. Agricultural lands and pastures have grown over the last decades. However, there is little evidence that non-agricultural land uses have risen substantially.

The structure of economic activity has changed somewhat in the region. Two sectors where we would expect strong growth following a desakota model are manufacturing and services. Table 1 shows the percentage gross domestic product of economic activities between 1979 and 1995 (INEI, 1996). The greatest change in the period has been the relative reduction in mining activity. As a percentage of overall activity, agriculture and services have remained relatively constant. Manufacturing has only a five percent higher share over this period. The share of activity from construction has doubled.

Table 1. Share of economic activity measure as percent of gross domestic product, Ucayali department, 1979 to 1995.

Activity	1979	1995
Services	29	29
Manufacturing	25	31
Agriculture	22	24
Mining	15	0.3
Construction	8	16
Fishing	1	0.3

The increases in manufacturing and construction – mostly likely occurring in the city of Pucallpa – may not be the best indicator of diversification of activities, especially in the rural areas. Table 2 shows participation of households in non-farm economic activity in 1994. Households were located according to the period of initial deforestation. The households found in the area where forest clearing began before 1955 are those in the core areas along the main transportation routes. At the other end of the spectrum are those households in areas more recently deforested, between 1989 and 1995. These areas are on the forest margin.

Table 2. 1994 household participation in non-farm economic activities, by period of initial deforestation.

Deforestation period	Participation in non-farm economic activity (%)		
	Number of households	Yes	No
Before 1955	436	13	87
1955 to 1974	1148	12	88
1974 to 1981	1463	9	91
1981 to 1989	1545	11	89
1989 to 1995	441	12	88

These rates of participation in non-farm activity are much lower than those found for the Amazon countries as a whole. The participation rate across the landscape – from core area to margin – hardly differs. Under a desakota model of development, the core areas would be expected to show more employment diversification. These data suggest a rural landscape with some degree of homogeneity in terms of economic activity.

Desakota development often includes urban to rural migration, or rural to urban and rural to international migration. Urban dwellers migrating to desakota regions are looking for opportunities to draw the rural areas into larger regional, national and international economic activities. Rural people migrating abroad often send remittances back to their families in the rural area they left. However, migration in the Central Peruvian Amazon has a strong rural to rural character (Table 3). The three Peruvian departments that are the source of the greatest number of migrants are largely rural departments straddling the Amazon and the Andes. The fourth largest origin area of migrants is the city of Lima, a city making up one third of the entire country's population. In these cases, migration is mostly into the Central Peruvian Amazon, and does not appear to exhibit the characteristics of migration in other desakota regions, such as the Andes.

Table 3. The origin of immigrants to the Central Peruvian Amazon, by Peruvian department, from 1993 census.

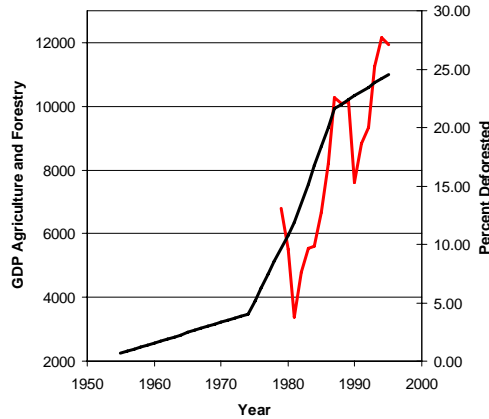
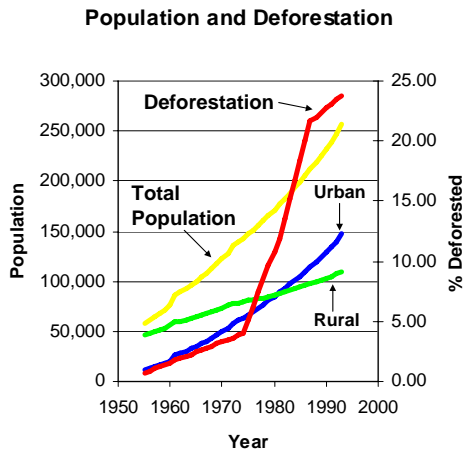
Place of Birth Department	Number of Immigrants Born Outside of Ucayali	Percent	Number of Immigrants Residence in 1988	Percent
OTHER	609	0.20	307	0.10
AMAZONAS	39163	12.80	7312	2.80
ANDRES-A-CACERES	46482	15.20	33979	13.10
AREQUIPA	1202	0.40	632	0.20
CHAVIN	2564	0.80	831	0.30
GRAU	1095	0.40	324	0.10
INCA	3156	1.00	1027	0.40
MARIATEGUI	1084	0.40	435	0.20
LIBERTADOR	5006	1.60	1573	0.60
MARANON	3957	1.30	1223	0.50
LIBERTAD	2502	0.80	1132	0.40
LIMA	10758	3.50	9942	3.80
CALLAO	672	0.20	531	0.20
SAN-MARTIN	14562	4.80	5019	1.90
Total	132812	43.40	64267	24.60
UCAYALI	169864	55.60	188096	72.60

Overall, development and change in the central Peruvian Amazon is similar to patterns found to the state of Acre in Brazil: extensive land and resource use remains the most economically rational strategy where the land frontier is open—*de facto* and perhaps *de jure* (Fujisaka et al 19xx). Development programs that essentially ask land and resource users to intensify their practices (e.g., agroforestry) often fail because the returns to extensive use of “free” environmental services are substantially higher than are returns from intensification. Figure 2 shows that increasing population closely parallels deforestation—an indicator of an open forest frontier. Figure 3 shows that forestry and agricultural gains in GDP have closely paralleled deforestation. Again, implicit is that settlers have come to the central Peruvian Amazon largely to take advantage of the open agricultural frontier rather than of opportunities in a more-desakota environment.

Under this scenario, activities that lead to deforestation have little perceived negative environmental impact at the local scale. But they do contribute to global carbon emissions. Opportunities for avoided deforestation in payment for environmental services schemes have some potential in this Amazon context (Swallow et al, 2007).

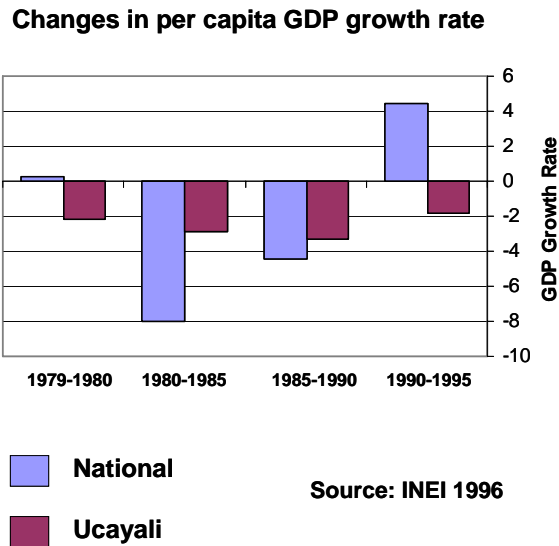
Figure 2. Population and deforestation

Figure 3. Deforestation and Agricultural and Forestry GDP



Extensive exploitation of the open frontier by poor immigrants implies minimal gains in poverty alleviation rather than the taking advantage of new opportunities of the sort afforded by desakota development. While per capita GDP for Peru as whole increased in the 1990s, the decrease in the Central Peruvian Amazon reflects this lack of sustained and desakota-style development on the open frontier (Figure 4).

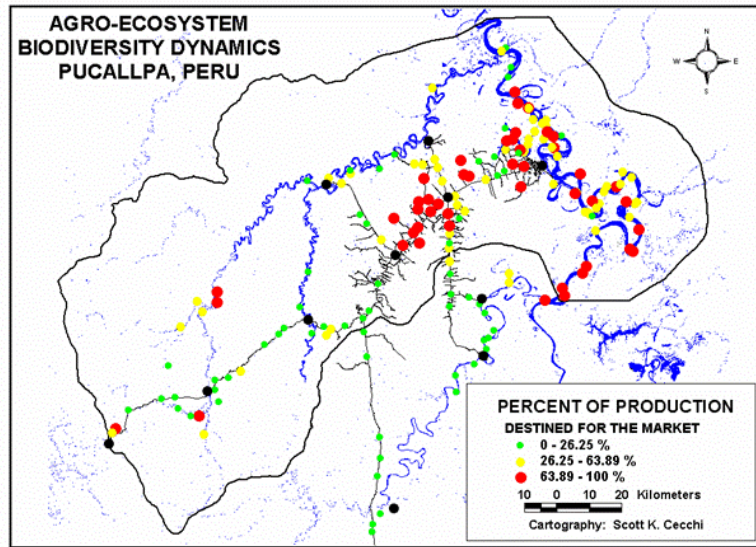
Figure 4. Changes in per capita GDP growth rates in Peru and in Ucayali department, 1979 to 1995.



In contrast to the Central Peruvian Amazon, more of a desakota type of development does occur where land frontiers have closed and where the returns to intensification were then sufficient to drive development of new agro-industries oriented to urban markets. The settlement of Theobroma in Rondonia, Brazil, is situated (intentionally by the Brazilian government in an early attempt to attract settlers to the Amazon in the 1970s) on an island of richer alfisols (compared to surrounding ultisols and oxisols). Initial slash-and-burn agriculture on these lands was not followed by the establishment of pastures and land degradation as is the case for much of the Amazon. Rather, and due to the richer soils and road connections to distant urban areas, the Theobroma settlement area has featured: a) a closing of the land frontier, in this case defined by soil quality, b) decreases in sizes of land holdings, and c) agricultural intensification into dairy and perennial crop production for marketing outside of the area. The needed provision of goods and services ranging from transport to information has spurred desakota type advances in what would otherwise be a distant, dusty and muddy part of the Amazon. Similar development is seen where the resources base is rich enough to permit intensification when the land frontier closes—e.g., in Costa Rica as well as Rondonia (Fujisaka et al 19xx).

Increased urban-rural interaction has been another inevitable result of development in the central Peruvian Amazon. One indicator of this interaction is the degree to which farmers send their produce to market, versus on-farm consumption. Figure 5 shows levels of market integration at the village level from the 1994 agricultural census. The areas furthest out on the forest margin, deforested after 1990, sent on average 40% of their produce to markets. Intermediate areas that were initially deforested between 1975 and 1990 sent about half their produce to market. The core areas nearest to the main transportation corridors of the region and experiencing the first wave of deforestation before 1975 sent 55% of the produce to market. These results suggest that, after initial land clearing and establishment of farming activity, regions develop a greater connection to urban markets. However, the changing share of market integration from the forest margin to the core areas is only 15%. Farms closer to urban areas and along the main transportation corridors still consume nearly half their production on farm.

Figure 5. Market integration as measure by the percentage of farm production destined for markets.



Increased rural-urban interaction may be indicated by the degree to which farmers organize, building social capital to help them succeed in the market. Participation in farmer societies and organizations shows a mixed result in the central Peruvian Amazon. Table 3 shows the percentage of households that are members in these organizations when the census was taken in 1994. The core region, deforested before 1955, has the highest participation rate, with rates decreasing for households where forest clearing began later. However, households in the areas cleared during the period 1981 to 1989 had 20% membership in farmer organizations. These data suggest some tendency towards greater social capital and market orientation in the core areas. This result may simply reflect proximity of areas long ago deforested to urban settlements. Another factor may be the longer time period these zones have had to develop.

Table 4. Percent membership in farmer organizations or cooperatives as a measure of social capital and desakota

Deforestation Period	Number of households	Percent membership	
		Yes	No
Before 1955	436	29	71
1955 to 1974	1448	19	81
1974 to 1981	1463	8	92
1981 to 1989	1545	20	80
1989 to 1995	441	9	91

Implications for policy, environmental services and poverty alleviation

Desakota-style development in the Central Peruvian Amazon has not occurred in the manner described by observers of this phenomenon in Asia. A major difference is the lack of numerous large urban hubs spanning the region. There is only one major road corridor linking the region to large urban areas. Access to international markets is weak. Population density is low compared to rural areas of China or India, or even to the Andes.

Promoting desakota-style development in the Central Peruvian Amazon could be counter-productive given the difficulty of developing non-agricultural and mixed economic activities. The region does not appear to have a critical mass of population, transportation infrastructure and interaction with national and global systems. The region's isolation would seem to preclude this possibility.

The key environmental service in the Amazon is carbon storage for abating greenhouse gas emissions. Water is generally plentiful. Soils can degrade quickly, but their condition does not negatively affect large populations. Given the high deforestation rates, paying farmers to reduce deforestation and its resulting carbon emissions would seem to have the greatest potential in payment for environment services schemes. A recent study showed that the value of forests to small farmers in the Central Peruvian Amazon is well below the level of what European industry is paying to offset their carbon emissions (Swallow et al., 2007). Working out the logistics of carbon trading in this region is far from complete, but the potential exists.

Achieving reductions in poverty will likely remain difficult in the Central Peruvian Amazon in the short term. Biodiversity conservation and protection of natural resources, together with schemes to avoid deforestation have some promise and should be pursued. Where there are opportunities to develop nonfarm income and employment, these should be pursued. Reducing poverty in this region will have to be opportunistic, taking advantage of possibilities in specific sites.

References

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