DEFORESTATION

CATTLE AND AMAZON DEFORESTATION

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About 35 years ago the Brazilian government began promoting the Amazon as a new agricultural frontier. Few people, other than some perceptive environmentalists, predicted that this would ignite one of the most visible controversies of the last several decades. Brazilian planners hoped to build infrastructure and occupy the Amazon with colonists, creating opportunity for the millions of poor families in the Northeast states and displaced farm labourers in southern Brazil. It was hoped that building access roads, providing cheap land and modernizing agriculture would be sufficient to stimulate rapid development of the region.

Today, roughly 600,000 square kilometres or 15% of the Brazilian Amazon has been deforested, an area about equal to Spain and Portugal together. Much of it is now in pasture to feed one of the fastest growing cattle herds in the world. In the nine Brazilian Amazon states that, in whole or in part, comprise the Legal Amazon there were over 47 million head of cattle in the year 2000, 80% higher than in 1990 and greater than the combined total cattle herds of Canada and Australia.

Fields of Dreams

As the colonization process progressed it quickly became apparent that agricultural expansion in the Amazon would mainly extend, rather than intensify, production. Some researchers thought it might be possible to terminate slash-and-burn with modern high-tech continuous agriculture and adoption of tree-based systems like agroforestry but these hopes were dashed. Instead, most small colonist farmers started with subsistence annual crop agriculture, did adopt some yield-intensifying technologies, but converted many fields into low-yielding pasture for cattle production. Large-scale ranchers often converted 10-15 thousand or more hectares of forests directly into pastures. Timber and mineral extraction grew into important, but exploitive, sectors rarely showing signs of adopting more intensive or sustainable management practices.

Today, the Brazilian Amazon contains a mosaic of land uses but cattle production is the dominant one in most regions. Despite decades of excellent research on agricultural production options the cattle herd relentlessly expands. Alternatives to cattle are routinely adopted on small farms but they usually occupy a small share of farmland. Forces such as labour availability, investment capital and marketing cost often limit them to small plots on farms. Large-scale ranches are likely to remain as ranches, although there is a trend to more intensive cattle production systems.

Economic growth in other sectors has also played an important role. Often roads are constructed and maintained in order to facilitate mining and timber extraction. The timber sector has expanded rapidly and there are now about 2,500 timber mills operating in the Brazilian Amazon. The harvesting of valuable timber is frequently the first step in conversion of forest into agricultural uses and, ultimately, pasture. Economic and population growth cause expanded consumer markets, with meat demand growth in the Amazon now recognized as a fundamental stimulant to cattle production.

The Brazilian government now wants to fast-track dozens of mega-infrastructure projects (paved highways, gas and power lines, hydroelectric projects and river channelling) under the *Avança Brasil* (Advance Brazil) program. The $40 billion of infrastructure investments planned between 2000 and 2007 are sure to have major impacts, both positive and negative, on the Amazon. The government is betting that economic benefits (even if some are transient) can be expected from improved roads, better access to gas and electricity, business development, GNP generation and job creation. Critics point to a suite of environmental and human costs from increased deforestation, over-hunting, illegal logging, wild fires and encroachment on nature reserves as well as territories of indigenous peoples. Often emphasized are the losses of future environmental and possible economic benefits stemming from carbon storage and biodiversity conservation.

Underlying this disquiet is the fear that if you build it they will come. Some critics worry that the infrastructure investments might set off a new wave of migration, swelling the 20 million population of the Brazilian Amazon. These fears could be overstated because Brazil is now highly urbanized and the urban poor are less likely to migrate to the Amazon. However, if they do come, based on past experience new rural colonists will often adopt the same slash-and-burn/pasture technologies found elsewhere in the Amazon and relentlessly extract (hunt, fish, log, and mine to exhaustion) all that is valuable. On the demand side, growing Amazon urban populations and income will stimulate consumption of beef, milk and other foods.

It All Comes Back to Cattle

Thirty-five years of accumulated experience now shows that extensive land uses seem to win out in the Amazon. Is there any evidence of positive changes to more intensive and sustainable production land uses?

Cattle numbers have rapidly and continuously increased despite enormous variations in Brazilian macroeconomic performance, inflation, research priorities, road construction activities, subsidies, development policies of the Brazilian government, human migration flows, funding by the international donor community and the chiding of environmentalists.

However, the cattle sector in the Brazilian Amazon has not operated in a technological vacuum. Adoption of improved pasture grasses has resulted in better production potential and more vigorous pastures. Greater experience with the tropical soils in the region has led to a better understanding and use of management practices. As a result, productivity on many cattle ranches has improved and the relative profitability of cattle production vis-à-vis the other options available to small and large ranchers in no longer in doubt. Along with other livelihood benefits (e.g., storing wealth, hedging inflation, maintaining liquidity), profits from cattle have helped many migrant farm families to move out of poverty, accumulate capital and lead better lives.

Despite a great deal of good work by dedicated researchers, development thinkers, planning agencies, NGOs and civil society groups, limited progress has been made to foster widespread uptake of alternative economic activities. Ecotourism, biotechnology, sustainable forestry and agroforestry all have their place but that place is still very limited compared to cattle production. Could it be that their potential economic and agroecological niches are actually small?

Better Land Uses can Evolve

Is better land use possible in the Brazilian Amazon? The answer could be a very cautious yes for three reasons. First, accumulation of experience and broadening of research agendas have occurred, which will increasingly allow development processes to be knowledge-based, not just technology-based. Second, Brazil is making important progress in establishing and consolidating governance processes that are more inclusive, responsible, and transparent. Third, environmental belief systems are changing in Brazil, with a growing acceptance of the need to adopt sensible, more equitable and environmental-friendly development strategies.

Business as usual will ultimately result in continued and high rates of deforestation and resource degradation. Stopping deforestation and saving the 85% of the forest that has not yet been cleared is unlikely unless agriculture stays on the land already occupied and future uses of the forest are carefully selected and managed. A shift to real and enforceable limits on forest encroachment will require the full application of knowledge systems, effective government policy and deliberate choices in favour of environmental objectives.

Many environmentalists would like to see the Brazilian government back away from planned Amazon infrastructure investments and instead put priority on preserving the remaining forest. In the absence of adequate markets for environmental services such as carbon storage and biodiversity conservation

for a forest the size of the Amazon, the Brazilian government is more likely to continue to pursue balancing economic expansion goals with targeted environmental investments such as parks and protected areas.

Considerable attention is now being directed at finding ways to provide financial incentives for environmental service provision. However, also needed are effective measures to ensure that these incentives would ultimately benefit poor people in the Amazon. But this will not be easy, given the potential financial sweepstakes that could emerge from paying for the carbon storage and biodiversity conservation provided by nearly 3.5 million square kilometres of forest. Effective multi-stakeholder decision processes where all Amazon stakeholders - not just political, economic and environmental elites - have voice and are empowered to fully participate in decisions could help ensure an equitable distribution. Unless financial benefits are targeted to the people who cut the trees to raise cattle for their livelihoods, payment for environmental services of forests is unlikely to be effective.

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