CHAPTER 66

EXTRACTIVISM AND AGRICULTURE: THE CHOICE OF ONE COMMUNITY ON THE RIO SOLIMÖES

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INTRODUCTION

The Bareira da Missäo community live on the Rio Solimöes (see Figure 65.1, page 769), slightly downstream from Tefé, in a region actively exploited for its forest products since the end of the 17th century. The population is descended from Cocama Indians, and though they no longer speak the language, they have conserved land management practices from their cultural roots, based on the collective ownership of land. The community discusses and decides on the location of clearings; similarly, any member of the community can collect the Brazil nuts from any tree. The community recently moved from flooded forest *varzea* to unflooded forests *terra firme*. They are not entirely used to managing the cycle of forest clearings, and they are discovering the limits of the slash–and–burn agriculture system on *terra firme* land where there is no periodic alluvial deposition to enrich soil fertility.

Their reserve covers 920 hectares, but it is not ideally placed as it has only limited access to the river, which is the community's water source and the only link with the market at Tefé. The soils, mainly oxisols, have reduced fertility, and are badly drained. The community consists of 33 families, totalling 170 people. They make their money by producing manioc flour and gathering Brazil nuts. Half the manioc flour produced is eaten. Brazil nuts are only eaten as snacks. Fishing is an important food source. The community is tending to increase manioc production at the expense of Brazil nut extraction. A comparison of the energetic costs and benefits of these two activities is presented.

AGRICULTURAL ACTIVITY

Agricultural activity consists mainly in producing manioc flour using the classic Amazonian technique, slash and burn agriculture, which will not be

Table 66.1 Manioc productivity (fresh weight) in relation to various cultivation plots

Vegetation type before cultivation	Forests		Fallows (*capoeiras*)	
Manioc cycle	first	second	first	second
Number of weedings	1	2	2	3
Productivity:				
Manioc tubers (kg ha^{-1})	12 412	7 737	9 236	6 682
Manioc flour (kg ha^{-1})	4 344	2 708	3 232	2 338

discussed further except to note that: cultivated plots are approximately one hectare; swiddens are made either in forest or in fallows (*capoeiras*), which are usually 10 years old, sometimes less: each cultivated plot is put through two manioc cycles; in the cleared forest plot, the first weeding is at eight months with two other weedings three and five months afterwards, whereas in the cleared fallows, two weedings are done three and five months after the first planting and a third after the second planting.

After clearing forest, the productivity of manioc tubers exceeds 12.4 tons ha^{-1} (fresh weight) for the first cycle and 7.7 tons ha^{-1} for the second cycle, whereas in *capoeira*, 9.2 and 6.7 tons ha^{-1} are produced respectively (Table 66.1). The quantity of manioc flour obtained from the different plots is in all cases approximately 35% of the weight of the tubers and this constant ratio shows that the growing conditions are not affecting the quality of the tuber produced.

EXTRACTIVE ACTIVITIES

The region is rich in Brazil nuts which, if not planted, have at least been protected throughout this century. A census of trees, taken along a gradient from the bank inland, shows clearly that the trees are more numerous by the river, in the zone occupied by the new and old clearings, which confirms the role of people in constructing the Brazil nut population. Before plots are burnt, the trees are protected with a series of precautions designed to shelter them from the heat. Neighbouring trees are cut so that their crowns are away from the tree and the shrubby vegetation around it is conserved as a fire barrier.

Access to the resource is not individualized; anyone may collect nuts from any tree at any time. This contrasts with the organization observed in the extensive Brazil nut population in Para or Acre, where each collector works on a clearly defined group of trees. It is clear that this system results in a dispersal of effort, and probably a reduced yield, since the collector may move from tree to tree not knowing whether its crop has already been collected by someone else. Only 19 families collect nuts. They can be divided into two groups: the *castanheiros* who produce between 20 and 30 boxes $year^{-1}$ (500–900 kg) and occasional collectors who produce 1 to 15 boxes $year^{-1}$ (30–400 kg).

COMMERCIALIZATION OF THE PRODUCTS

Manioc flour production enters different exchange systems: half is eaten by the family, and some is reserved for intra-community exchange; the flour produced is of high quality, is lightly roasted, and does not keep long, so sometimes the family runs out of prepared flour and is given some by an allied family, in reciprocal exchange. Excess production is sold directly by the producer, either to a travelling seller (*regatão*) or in the market in the nearby town of Tefé.

The exchange structure for Brazil nuts is more like that which underlies classic extractivist activities. *Aviamento* seems to have disappeared, or at least been monetarized, but the patron, the exclusive buyer, is still present and continues to buy at the price he wants. More surprisingly, and in total contradiction to what one would expect from an Amerindian culture, some members of the community have specialized in centralizing and selling the collected nuts, thus reproducing the classic patron–intermediary–client model of extractivism. However, these intermediaries are vulnerable, unable to buy the minimum technical equipment (sterilizer) which would enable them to stock the product and sell it at the end of the collection season when prices are highest. They sell the nuts from day to day, losing to the patron at Tefé the added value sterilization would provide. Similarly, they do not envisage buying a simple machine to separate nuts and shells, which would enable them to sell a processed product.

ENERGETIC AND ECONOMIC COSTS AND BENEFITS

The length of time taken by different stages of work were measured. The energetic cost of each stage was calculated according to the FAO/WHO/UNU guidelines (1985), multiplying its Metabolic Constant (MC) by the Basal Metabolic Rate (BMR) for each person. The MC of each activity could not be measured directly in the field so we used estimates drawn from the

Table 66.2 Energy and time spent on manioc flour production and Brazil nut gathering

	Agriculture				Extractivism
Initial vegetation	Forests		Fallows (*capoeiras*)		
Manioc cycle	first	second	first	second	
Energy cost (kcal ha^{-1})	403 317	290 455	409 348	298 472	
Energy cost (kcal kg^{-1})	92.8	107.2	127.0	128.0	311
Time spent (h ha^{-1})	1 831	1 276	1 629	1 019	
Time spent (h kg^{-1})	0.42	0.47	0.5	0.45	0.99
Mean return Crz/1000 kcal		202			16

literature (Consolazio, 1964; FAO/WHO/UNU, 1985; Pasquet *et al.*, 1993, this volume; Uhl, 1990). BMR varies according to age, weight and sex. Six classes of producers were selected: children, adolescents and adults of both sexes. For each class, average weight was calculated and an average BMR defined. The data on the energetic costs presented are averages calculated on at least three observations for each activity.

The main estimated or measured values for each activity in terms of time invested and energetic cost are presented in Table 66.2. A comparison of money earned for energy expended shows clearly the advantage of agricultural activity over extractive activity. Between 93 and 128 kcal are required to produce 1 kg manioc flour, depending on the type of clearing, of which half is spent on producing flour from the tubers. Producing 1kg of Brazil nuts requires 311 kcal. In terms of time spent, the difference is less noticeable, taking 1 hour to produce 1 kg of product. In terms of economic return for energy spent, it is clear that with a price of 202 Crz for 1000 kcal spent in producing manioc flour, agriculture is 12 times more profitable than collecting Brazil nuts.

CONCLUSION

The strategy which the producers are clearly taking, that consists of increasing agricultural production at the expense of extractive production, is evidently justified by these data alone. However, increase in the production of manioc flour may well be limited, because of a shortage of available land, the increase of effort required with the increasing remoteness of the cultivated plots and thus the necessary reduction in the time for which clearings are left fallow (presently 10 years, but farmers are already tending to reclear after 5 years) which will cause not only impoverishment of the soil, but also problems of invasion by weeds which will become insurmountable.

An alternative strategy could be sought in the improvement of the extractivist component of the production system, including management of non-collective collecting. Finally, it will require a modification of the present exchange system, which is based on the most classic form of extractivism in Amazonia.

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