AMAZON NUTS, FORESTS AND SUSTAINABILITY IN BOLIVIA AND BRAZIL

Willem Assies[1]
Centro de Estudios Rurales, El Colégio de Michoacán, México[2]

1. INTRODUCTION

When the Rainforest Crunch and similar Amazon nut-based products were launched on the North American market in the late 1980s, the inventors of 'caring capitalism' argued that the market could be used to save the rainforest and that this would be 'a moral reason to munch' (New York Times, April 30, 1990:D12). Cardboard boxes in which the nuts are shipped to consumers in the USA and Europe bear the message 'Buy Brazil Nuts, Help to Save the Rainforest.'

These are crude translations of the idea that the commercial extraction of NTFPs can be an important component in strategies for rainforest conservation. Making the forest economically productive, the argument goes, will discourage deforestation. For northern Bolivia, one of the areas where I carried out my research, it has been argued that 'independent of its organisation and the distribution of benefits, (the Brazil nut economy) will be particularly favourable to conservation of the area' (DHV, 1993:10). In other words, it is contended that, given the profitability of the product and the symbiotic relation of the Brazil or Amazon nut tree (*Bertholletia excelsa*) with its forest environment, this environment will be conserved in order to guarantee a continued supply of Amazon nuts.

Between 1994 and 1996, I carried out research (Assies, 1997a) in northern Bolivia and in the contiguous Brazilian state of Acre, the cradle of the well-known rubber tappers' movement inspired by Chico Mendes. The objective was to research the socio-economic and political aspects of Amazon nut exploitation in order to assess its potential contribution to rainforest conservation and the improvement of the living conditions of the rural population. Research in both Bolivia and Brazil where, in response to the actions of the rubber tappers and their transnational supporters, extractive reserves were being implemented, introduced a comparative component. This is of particular interest, since Amazon nuts are an export product and the two areas compete on the world market. Brazil used to be the main supplier of Amazon nuts and the extractive reserve strategy was premised on the economic viability of Amazon nut production. In recent years, however, Brazil has been superseded by Bolivian producers as part of a strategy of non-traditional export promotion aimed at boosting the Bolivian balance of

[1] When he was attached to the Centre for Latin American Research and Documentation (CEDLA) from 1994 to 1996, the author carried out a post-doctorate project on the social and economic aspects of the Brazil (Amazon) nut economy. The Netherlands Foundation for the Advancement of Tropical Research (WOTRO) and Tropenbos jointly financed this project, which was carried out in co-operation with the Programa Manejo de Bosques de la Amazonía Boliviana (PROMAB) based in Riberalta, Bolivia. The latter is a joint effort of the Instituto para el Hombre, Agricultura y Ecología and the Universidad Técnica del Beni in Bolivia, and the Prince Bernhard Centre for International Nature Conservation of Utrecht University, the Netherlands.

[2] Martínez de Navarrete 505, Las Fuentes, 59690, Zamora, Mich., México. E-mail: assies@colmich.edu.mx

payments.

My research sheds serious doubts on the idea that, under present conditions, commercial extraction of NTFP will contribute to rainforest conservation and sustainable development. Sustainability is held to combine ecological sustainability, economic feasibility, and social and political acceptability (Barbier, 1987; Ros-Tonen, Dijkman and Lammerts van Bueren, 1995). In drawing attention to the economic and social dimensions of sustainability, this approach constitutes an important advance over a narrow focus on the ecological aspect. It fails, however, to appreciate the dynamics of the economic system.

Within the framework of the prevailing economic system, the commercial viability of a product basically translates as profitability, which means that economic feasibility is conditioned by the systemic requirements of competitiveness. The ensuing dynamics, I shall argue, may lead to the marginalisation of forest-dwelling, small producers of NTFPs. In northern Bolivia, this results in agriculture, which implies deforestation, increasing its importance in the livelihood strategies of those who remain in the forest, whereas those who migrate to urban areas come to constitute a labour pool for the exploitation of whatever forest product that can be profitably exploited, without consideration for ecological sustainability.

2. A 'TRADITION' OF EXTRACTIVISM

To begin with, my research led me to examine the reputation of sustainability of Amazon nut production. After all, in the promotion of Amazon nut consumption, the creed that they are produced by small producers who have a long tradition of familiarity with the forest plays a key role. Scrutiny of this tradition of extraction reveals the connections between Amazon nut production, rubber tapping and agriculture and demonstrates that the present-day small producers of Amazon nuts are the product of a crisis of the 'traditional' extractive economy.

The rubber boom of the late 19th century was central to the emergence of the extractive economy in the region. In response to demand from the emerging industrial metropolises rubber tapping spread throughout the Amazon region. Large numbers of people, principally male labourers, were recruited and shipped to the Amazon region[3]. At a local level, production was organised in *barracas*; rubber estates which relied on a system of debt-peonage. As rubber production was highly profitable and in order to reinforce dependence on the local *patron*, agricultural activities by rubber tappers were discouraged, if not simply repressed. Food products, ranging from rice, beans and canned meat to luxuries, such as chocolate and champagne, were imported and distributed by the *patrons* who kept track of the accounts. Since food products came from elsewhere, deforestation was minimal at the local level.

Things changed when the rubber boom collapsed after 1913 due to Asian competition. Although the *barraca* system survived the crisis, it was substantially reorganised. Besides rubber, Amazon nuts emerged as a new product and local agricultural production increased substantially, as the capacity for importing food products declined. Another feature of the new configuration was that *patrons* now allowed the rubber tappers to establish families. Initially, the rubber estate had been an essentially male universe, but now women would be incorporated into a system encompassing rubber tapping, agriculture and Amazon nut gathering. They might actually be imported by the *patron* just like any other

[3] In 1903 the new export economy prompted the conflict between Bolivia and Brazil by which the latter country annexed a substantial part of Bolivian territory, the present state of Acre.

item desired by their dependants, provided they kept paying off their debts in produce (da Costa, 1989: 65; Woortman, 1996: 16). Amazon nut production and food production could be functional alternatives (Woortman, 1996). Thus food production was controlled in some cases by the *patron*, who then exchanged the product for rubber and nuts. Nut gathering would be a family activity. In other cases, food production by the newly constituted rubber tappers' families was allowed, with women being mainly responsible. Whether controlled by the *patron* or in the context of *patron*-supervised household production, agriculture became an important element in the annual production cycle. Although this implied deforestation, such deforestation was dispersed, as it was associated with the geographical distribution of the *barracas*.

After a brief revival during the Second World War (Martinello, 1988) the decline of the rubber economy resumed its course. It was accompanied by a breakdown of the *barraca* system and a further shift in favour of household production. As an increasing number of *patrons* withdrew and switched towards more profitable, often urban-based, activities, rubber tapper households were left behind to fend for themselves. The times of the 'big patrons' were definitely over (Aramburu, 1994).

The 'autonomous rubber tapper' in Brazil and the Bolivian *comunidades libres* were outcomes of this involution process of the traditional extractive economy. They are products of the crisis of the estate system[4]. And it is only in these cases that rubber tapping, Amazon nut gathering and agriculture constitute an agro-extractive cycle (Assies, 1997a: 8) articulated at the household level which might enable people to make a living in the forest throughout the year.

Rubber tapping was the cornerstone of this forest-based household livelihood, but this cornerstone soon fell away. Rubber production in both Brazil and Bolivia was kept from total collapse until the 1980s by a price support scheme implemented by the Brazilian government in the wake of the Second World War. The arrangement was dismantled during the 1980s in the context of a revision of the relations between the Brazilian federal government and local oligarchies, neo-liberal policies, and the emergence of rubber plantations outside the Amazon region in the state of São Paulo. As the price of natural rubber fell from US$ 1.80 per kg in the 1980s to less than US$ 0.80 in the 1990s, production in the Amazon region collapsed (Assies, 1997a: 30-35).

The consequences were significant, both in terms of demographic dynamics and in terms of the impact on the agro-extractive cycle. As the rubber trade dwindled, the trade networks it had supported shrivelled. Travelling the rivers to trade rubber for basic necessities with rubber tappers dispersed in the forest now lost its rationale. This, in turn, prompted people to move to more accessible areas. At the same time, the tendency toward subsistence food production intensified. Population and agriculture, and the attendant deforestation, therefore tend to concentrate in the more accessible areas, mainly around the urban centres and newly established road links.

3. EXPORT-ORIENTED EXTRACTIVISM AND FOREST CONSERVATION

Rubber and Amazon nuts are the products that were to underpin the extractive reserves proposed by the rubber tappers' movement. In the region, both rubber and Amazon nuts depend on a symbiotic relation with the surrounding forest and risks of over-harvesting are low. As such, extraction of these

[4] This point should be underlined, since the representation of the rubber tapper promoted by certain intellectual and ecologist circles is often tainted with idealism and romanticism. A 'mythical rubber tapper' has been constructed. Such imagery may be a source of misinterpretation of social dynamics and the aspirations of 'forest peoples' themselves (Aubertin and Pinton, 1996; Assies, 1996; Geffray, 1995:175; Léna, 1992).

products is ecologically sustainable. Whether commercial extraction contributes to forest conservation, however, is another matter. As we have seen, rubber ceased to be much of an option when price support was withdrawn and plantation production expanded in Brazil. Amazon nuts were the other product expected to underpin the extractive reserves. The problem is that the product met with strong competition from Bolivian producers.

Until the mid 1980s, nearly all the nuts produced in Bolivia had been exported in-shell to Brazil. By the mid 1980s, however, Bolivia was 'discovered' as a source of Amazon nuts by US and British importers who purchased nuts at a price about 30% to 40% below Brazilian export prices. Further expansion was facilitated by the World Bank-funded *Fundación Bolivia Exporta*, which aimed to promote non-traditional agro-industrial exports in order to strengthen the Bolivian balance of payments (DHV, 1993:2). While only one processing plant existed in northern Bolivia in the mid 1980s, ten years later, the number had grown to about 22 and virtually all Bolivian exports now consist of shelled nuts. The total export value rose from around US$ 2.5 million in the early 1980s to US$ 30 million in 1997. Their commercial success was related to a form of organisation of the local extractive economy that raises some serious questions about its final contribution to forest conservation and sustainable development of the region.

The Amazon nut economy of present-day northern Bolivia was built on the ruins of the rubber economy. The collapse of the estate system prompted a process of relocation of the population through rural-rural and rural-urban migration (Assies, 1997a: 45). As rubber estates declined, *comunidades libres* emerged, a development that went hand-in-hand with a migratory process which profoundly modified the geography of rural settlement (Figures 1a and 1b).

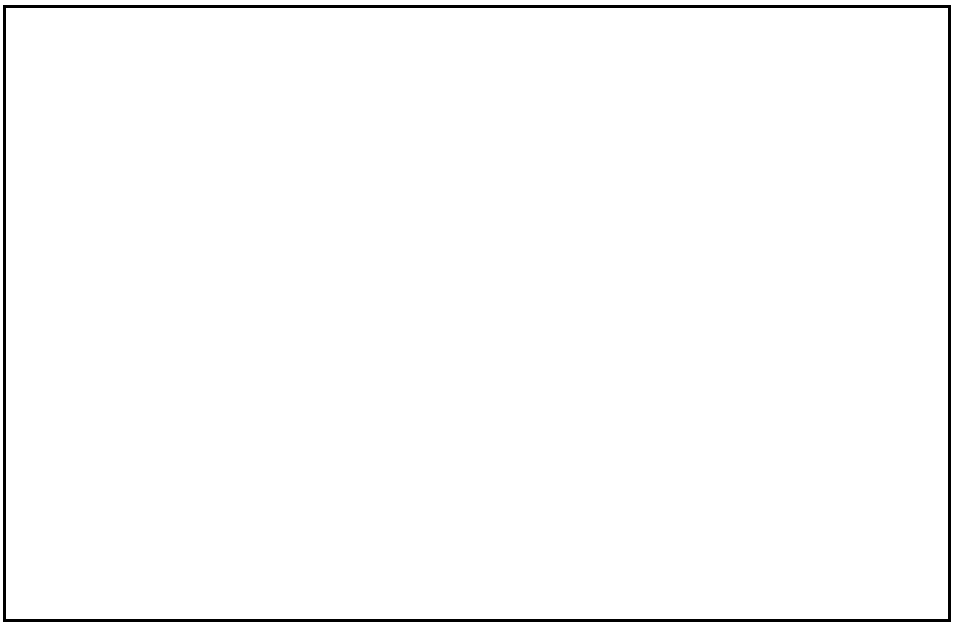

Figure 1a Settlement pattern under *barraca*-system (after Pacheco, 1992)

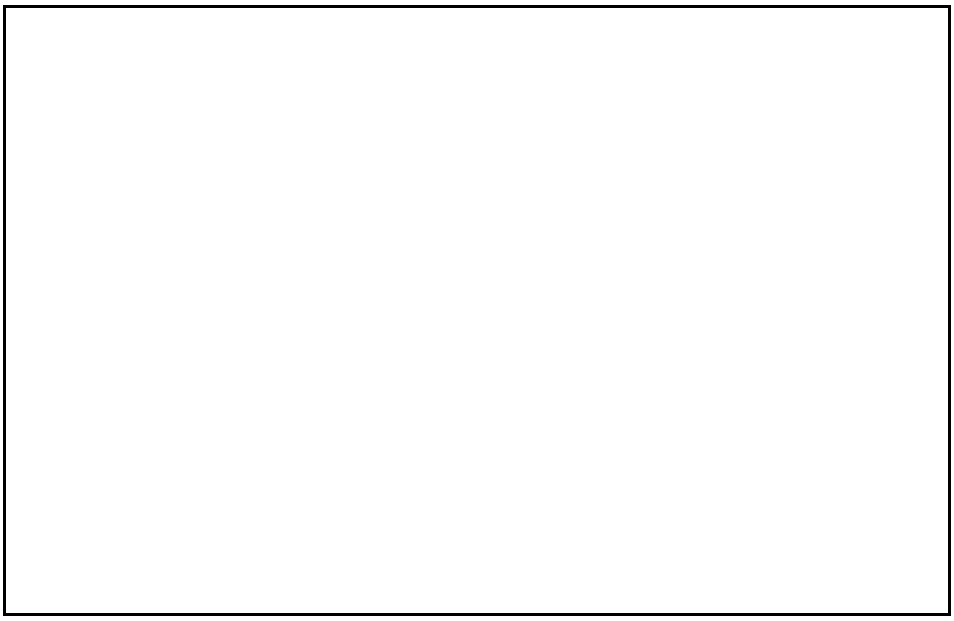

Figure1b Settlement pattern under the *comunidades libres* (after Pacheco, 1992)

At the same time, many people moved to urban areas. The town of Riberalta was the most important pole of attraction with annual population growth rates estimated between 4% and 9% over the past few years (Beijnum, 1996:13; Verheule, 1998). This was the context for the rapid expansion of the Amazon nut industry.

When the promotion of exports from the region was discussed around the early 1990s, it was under the double perspective of strengthening the balance of payments and of forest conservation. Two possible scenarios were foreseen: (i) it was contended that, irrespective of its organisation or the distribution of benefits, the Amazon nut economy could contribute to forest conservation; (ii) it was argued that participation of the peasant sector, that is the *comunidades libres*, in the nut harvest was increasing and might be furthered in order to promote a 'democratisation of the Brazil nut economy' (DHV, 1993)[5].

The latter scenario was recommended, but organisation of the industry took a different course, in which the *beneficiadoras* (processing plants) played a key role. In order to secure the supply of raw material, a process of vertical integration has taken place, with plant owners taking over the often virtually abandoned *barracas* where nut stands are located. Meanwhile a new system of labour relations had emerged. The labour force available in the urban areas has become the basis for a system of contracted labour gangs engaged in the exploitation of forest products. For the Amazon nut harvest, each December, between 5,000 and 8,000 persons, about a third of the working age population, set out from Riberalta for the collection areas, often under the supervision of a labour contractor whose operations are financed by the *beneficiadora* owners. About two-thirds of the total supply of raw nuts is harvested in the *barracas*.

[5] As I have demonstrated (Assies, 1997a:59-64; 1997b) the calculations that informed this proposal strongly overestimated the role of extractivism in household production and income and failed to capture location-specific differentials in rural community dynamics.

The process of vertical integration, in combination with the contract labour system, tends to relegate the small producers of the *comunidades libres* to a residual, complementary role. These small producers of raw nuts may be differentiated according to their distance from the urban centres[6]. Those living close to the urban centres may receive a relatively good price for their produce, but the quantities they can produce are small, since the plots in these areas are small (between 50 and 80 hectares) because of the clustering of the population. Those living farther away may have access to larger forest areas, but the prices they receive tend to be lower. At the same time, the process of vertical integration contributes to the marginalisation of small producers in more distant locations, as unit costs are high in comparison to the more 'efficient' *barraca*/ labour-gang system.

The question whether Amazon nut production contributes to forest conservation cannot be answered as directly as is often done. One usual argument is that, since a NTFP adds value to the forest, it will encourage conservation. Another is that, irrespective of its organisation or the distribution of benefits, the profitability of Amazon nut exploitation contributes to forest conservation, since local capital would otherwise be displaced towards other forest uses, such as indiscriminate logging. A third argument is that NTFPs provide an income for forest-dwelling people who are viewed as a social fence against indiscriminate exploitation.

The first argument - that of added value as a stimulus to conservation - is questionable in the context described. Amazon nuts are a valuable product that cannot easily be over-exploited. This largely accounts for its ecological sustainability. Outside the Amazon nut harvest season, however, the system of urban-based labour gangs also functions in the exploitation of palm hearts (*aÝaí*) which has expanded rapidly in recent years and is expected to deplete the resource within ten years. Equally, the system functions for logging operations which are on the increase. The number of tree species exploited has gone from three to about eighteen over the past years (Beekma, Zonta and Keijzer, 1996). As they do not involve wholesale clearing, these two activities do not immediately menace Amazon nut reproduction. The town of Riberalta, with a rapidly growing population, largely depends on the exploitation of forest resources and pressure will only increase if no alternatives are found.

Also the second argument, which claims that Amazon nut exploitation diverts capital form less sustainable forest uses, is also questionable, since these activities are seasonal and do not coincide. For that reason, I do not think that a direct trade-off exists between them. They are more likely to be articulated into a diversification strategy on the part of local entrepreneurs, as quite clearly is the case for Amazon nut and *palmito* processing.

With respect to the third argument, that local people form a social fence against indiscriminate exploitation, it is important to note that Bolivian competition on the Amazon nut market helped to undermine the viability of the extractive reserves in Brazil, a point to which I shall return. In Bolivia itself, forest-dwelling, small producers tend to be marginalised as a consequence of the organisation of production that underpins commercial success.

[6] The demographic configuration of the region is strongly affected by the improvement of the road system, which tends to substitute the fluvial transportation system. For a recent overview and a somewhat different interpretation see Stoian and Henkemans (1998).

In the livelihood strategies of the rural population agriculture is of central importance in the quest for food security. Its role and the degree of commercialisation are likely to increase in response to expanding market opportunities, particularly in advantageously located areas, which are also the main areas of attraction for rural-rural migrants.

4. AMAZON NUT EXPLOITATION AND PARTICIPATORY RESOURCE MANAGEMENT

Rubber and nuts were expected to be the key supports for the extractive reserve strategy for participatory forest management. While rubber ceased to be an option, Bolivian competition on the Amazon nut market also contributed to the eroded viability of the extractive reserves. As we have noted, the number of processing plants in Bolivia has rapidly increased and virtually all Bolivian exports now consist of shelled nuts. Shelling is done manually with the help of small machines. The *beneficiadoras* in Riberalta provide employment to some 6,000 people, mainly women, during about eight months a year (Coesmans and Medina, 1997; Verheule, 1998). Though working conditions have been improving somewhat in recent years, partly in response to the pressure of product quality requirements of the international market, low wages in processing were, and still are, an important factor in Bolivian competitiveness (de Veld, 1998).

This had direct consequences for Brazilian exporters, including the Xapuri Co-operative and its processing plant, which was created shortly after Chico Mendes' death in 1988 with the help of international donors. The co-operative was meant to provide an alternative to the established Brazilian exporters with their rather unsavoury reputation. By capturing a larger share of value added, it was to contribute to improving local peoples' livelihood and thus to the viability of the reserve strategy. However, as a result of Bolivian competition, aggravated by Brazilian exchange rate policies adopted in 1994, Brazilian exports of shelled nuts, including those from 'correct' sources, have sharply dropped.

Though there were many other reasons for the disappointing performance of the Xapuri Co-operative, Bolivian competition based on about 35% lower wage costs, was among them (LaFleur, 1992). In response to such competitive pressures, the Xapuri plant was virtually deactivated in 1993 and a system of decentralised shelling in rural mini-factories was introduced. The new system relied on piece work and the informalisation of labour relations in order to cut the social security bill. The decision to opt for this system was harshly criticised in an evaluation report by Susanna Hecht, Peter Warner and Willem Groeneveld (IPHAE, 1994) who questioned its efficiency and its effect on quality, as well as its socio-economic impact. To reduce costs, they suggested, the co-operative should reconsider its raw material price policy, that is it should reduce the prices paid to gatherers and control the quality of their product. Whatever the merits of the different options, the crucial point is that Bolivian competition was an important factor in eroding the viability of the extractive reserves. As NTFP production declines in the reserves in Acre, agriculture and small-scale cattle raising expand, while there is increasing pressure to permit selective logging within the reserves (Hall, 1996).

In Bolivia, the system of forest exploitation that arose after the collapse of the rubber trade poses particular problems for forest management schemes. Whereas Amazon nut production is not particularly damaging, logging and palm heart extraction do pose serious threats to the forest. The devastation of the *palmito* stock became a theme for public declarations. The local forestry service repeatedly prohibited further harvesting without much conviction and without much effect, as processors declared that depriving harvesters of this source of income would cause 'a social problem' (*El*

Rumbeador, 5 August 1994). Though the processing industries said they would do something about replacement, this mainly was a public relations gimmick. Plantation-like production of other species with a shorter regeneration cycle, but foreign to the region, is now being proposed. Some processors may thus acquire their own stands or some rural dwellers may have access to a new source of income. Whether urban-based *palmito*-harvesters will benefit and, if they do not, what they will do to make ends meet, remains an open question.

No logging concessions existed in the region until 1992. Logging was done informally. In 1992, despite the Bolivian *Pausa Ecológica* (declared for 1990-95), four concessions were given out in the Pando Department to compensate companies for the loss of their concessions as a consequence of the creation of Chimanes reserve. Though the Forest Law at that time required management plans to be implemented, no such plans were known. The scope for control by the local forestry service was minimal. It is hoped that this situation will change as a result of the new 1996 Forest Law. Enforcement problems are only exacerbated by the current exploitation system which relies on urban-based labour gangs.

As I have argued, this 'urban bias' impinges on the rural smallholder communities and their role in NTFP production and therefore conditions their management practices. It should be clear, in any event, that agriculture is central to smallholders' livelihood strategies. While the diversification of agricultural production or agroforestry was promoted in earlier development projects, this was mostly out of concern for the nutritional conditions of the rural population and as a potential source of income. Only recently has forest management as such come into the picture. The forestry dimension is often emphasised in the advocacy of agroforestry systems, while the agricultural dimension receives less attention. Thus projects often rely strongly on the yields of commercial perennial crops and some tree products[7]. The emphasis on commercial perennials at the expense of food production for subsistence (and for sale) disregards rural dwellers' quest for food security. It would be a delusion to think that income from perennials or from extraction will detract forest dwellers from agriculture. Due attention should therefore be given to this dimension.

5. PROSPECTS FOR DEVELOPMENT?

The foregoing does not provide the most cheerful picture of the potential of Amazon nut exploitation in improving peoples' livelihoods. For one thing, the rise of the Bolivian Amazon nut industry has been a factor contributing to the problems of the extractive reserves across the border.

Co-operative ventures within Bolivia also meet with difficulties. A Riberalta-based peasant co-operative, set up in the 1980s and supported by the Dutch Voluntary Service (SNV), has broadened its activities to include processing in order to capture a larger share of value added. Although the original intention was that the cooperative should process the nuts produced by the *comunidades libres* in order to contribute to the income of the forest dwellers, by 1996, in line with the overall development of the industry, it was considering the purchase of a *barraca* to be operated by urban-based harvesters.

[7] Some ten years ago coffee, black pepper, cocoa and achiote (used as a dye in cosmetics and cheese rind) figured prominently in proposals all over the Amazon region. More recently, achiote, cupuaçu (used for juices and ice cream), and the introduction of new species of *palmito* became fashionable. Quality, however, is a problem, while the markets for such products are limited, quickly saturated (as may happen with cupuaçu), and highly volatile (as in the case of achiote which is suspected of being carcinogenic).

In the initial proposals to promote the Amazon nut trade through interventions by the newly created *Fundación Bolivia Exporta*, the co-operative had been given a central role in democratising the trade, but the emphasis soon shifted to the *beneficiadora* owners. From 1994 they were granted various loans by the *Fundación Bolivia Exporta* to improve processing and the quality of raw material gathered in *barracas* now owned by the *beneficiadoras* (Assies, 1997a:64; 1997b). Export promotion efforts thus linked up with the process of vertical integration of the industry. Attractive profitability and financial self-sustainability are the prime objectives of the *Fundación* and the co-operative was not viewed as fitting such categories.

Bolivia's rise to prominence in the world market for shelled nuts was accompanied by a heavily speculative trade. Moreover, as a bad harvest was expected for 1998, importers filled their warehouses. World market prices rose to about US$ 1.50 per pound of shelled nuts. In order to fulfil their commitments, the Bolivian *beneficiadoras* saw themselves obliged to raise the prices for raw material on the local market, even buying across the border in Brazil. Local prices for a crate of raw nuts (nominally 22 kg, which yields some 7.5 kg of shelled nuts) delivered in Riberalta rose to about Bs 50 in 1997[8].

By 1998, however, world market prices dropped to below US$ 1 per pound of shelled nuts. The relatively good 1998 harvest and the prospect of sharpened quality requirements regarding aflatoxin content by the EU contributed to the plunge. Thus the price for raw nuts delivered in Riberalta dropped to Bs 25 per crate, about the 1994 level. In view of the dynamics of the local trade, purchases from forest-dwelling small producers are likely to be reduced, while labour-gang based production continues to be the main source of raw nuts. Moreover, collectors' income will drop significantly. Although it can always be argued that, in the absence of the Amazon nut industry, things would have been worse, optimistic views about income distribution based on the high prices for raw material in 1996 and 1997, which benefited collectors and *barraqueros*, should therefore be qualified. It should further be noted that the processing industry relies on unskilled labour and that wages show little improvement. On the whole, the prospects for future development of the urban labour market are rather gloomy (Verheule, 1998).

6. CONCLUSIONS

The organisational configuration of the Amazon nut industry in northern Bolivia is an important factor in explaining its competitiveness and its success in marketing a non-traditional export product. However, although the marketing strategy relies strongly on the 'green product' imagery, the dynamics of the industry contribute to the marginalisation of small, forest-dwelling producers. This erodes the social basis for more participatory forms of forest management. Forest-dwellers turn to agriculture, first of all for subsistence and, where possible, on a commercial basis. The dynamics of spatial concentration and competition for land of this type of agriculture in the more accessible areas sets into motion a process whereby 'shifted cultivators' are created. The area under pressure from agricultural ventures thus expands in an ink-spot like fashion. The political ecology model proposed by Durham (1995) provides an adequate framework for analysing such dynamics (cf. Assies, 1997a, 1998).

If the boom period of 1996-97 and high prices for raw material also benefited small forest-dwelling

[8] The price hike that was probably also fuelled by money laundering operations in the region.

producers, owners of small *barracas* and, to a certain point, the urban-based collectors, such circumstances should not give rise to over-optimism (de Veld, 1998). Inequitable income distribution, poverty and the absence of employment alternatives presently underlie economic viability and provide the background for forms of over-exploitation of resources, as illustrated by the ineffectual bans on *palmito* harvesting. In this context, the role of NTFP production, basically Amazon nuts, as an incentive to forest conservation is questionable. After all, they are another exploitable resource, like timber or palm hearts, the difference being mainly that it is so difficult to over-exploit Amazon nuts.

In future investigations of Amazon nut production in northern Bolivia three issues require further exploration:

1. *The dynamics of differentiation among forest-dwellers.* Representing them as basically 'extractors' is misleading. The importance of agriculture as a source of food security and cash income should be acknowledged and, rather than expecting too much from alternatives, possibilities of enhancing its sustainability should be given due attention. Special attention should be directed to the dynamics of social differentiation within peasant communities and to the relations between peasant communities and local 'farmers' (*granjeros*) and the ways in which these affect land-use patterns, access to land, uses of labour and capital, market orientation, the 'shifting' of cultivators, etc.

2. *The impact of the 1996 Forest Law.* Various types of 40-year concessions can be granted under this law. Apart from the 20% of publicly-owned forest areas fit for exploitation that municipalities may grant to local social organisations, concessions are up for bidding. Logging concessions cost a minimum of US$ 1 per hectare; concessions for extractive uses cost a minimum of 30% of this amount. Whereas social organisations pay the minimum fee over the area of potential exploitation under a management plan (logging) or an exploitation plan (extractive activities), for private concession holders the fee is levied on the price paid at auction[9]. Private owners of forest land equally pay the minimum fees and are subject to the other regulations.

A first impact of the law has been that a market for exploitation and management plans has been created. Plans support claims. The process of granting concessions and the actual payment of fees is not very clear, however[10]. Neither are future impacts easy to predict. The law aims at 'integral and efficient exploitation', implying a progressive diversification of activities to be reflected in the implementation of management plans[11]. Another outcome might be some sort of reversal of the present trend towards vertical integration in attempts to shift the burden of fees to local communities. Whether fees can be collected from these communities remains to be seen. The possible consequences for the organisation of the Amazon nut harvest or other forms of forest exploitation are equally uncertain. It also remains to be seen how this legislation will interact with the new land reform legislation in a region where access to land and forest areas hitherto was regulated by 'local law'. In any case, the idea that the new legislation has drastically changed the way forest resources are exploited in Bolivia and has opened the way to sustainability and conservation seems to be premature.

---

9 Indigenous peoples also have to pay the fee, but only for the part of their territory effectively exploited.

10 Even before the forestry service had been restructured under the new law, a series of concessions already seems to have already been granted in the region without any consideration for pending claims by indigenous and peasant communities, who should have received priority under this law.

11 The payment of fees per hectare, rather than per volume of product, is meant to curb corruption and is also expected to promote 'efficiency and competitiveness' in the progressively integral exploitation of the concessions.

3. *Developments in the Amazon nut industry*. The rise of the industry resulted in a proliferation of processing plants. Gradually, new relations were established among processing plants, some of them becoming mere suppliers of processed nuts to larger plants. This process of hierarchisation is paralleled by the upgrading of a number of plants that have broader access to capital resources. These plants are becoming professionalised. They capitalise the production process and have started to introduce mechanised shelling, which may reduce unit costs and increase quality. Industrial concentration is the likely outcome of such processes and, in the longer term, four or five large processors may remain (de Veld, 1998). What consequences this may have for the labour market remains to be seen. For the moment, shelling has provided employment for an unskilled, mainly female, labour force. Whether a reduction of employment opportunities in the industry will be compensated for by other and better labour opportunities in the face of a growing labour supply is a critical issue for the future of the northern Bolivian Amazon.

7. REFERENCES

Aramburu, M. (1994). Aviamento, modernidade e pos-modernidade no interior Amazônico. *Revista Brasileira de Ciências Sociais*, 25: 82-99.

Assies, W. (1996). Local struggles and global problems, the rubber tappers' movement in Acre against the greenhouse effect. Paper presented at the Brazilian Studies Association Third Conference, King's College, Cambridge, 7-10 September 1996. *Third BRASA Conference Proceedings*, Albuquerque, BRASA, New Mexico.

Assies, W. (1997a). *Going nuts for the rainforest.* Thela Publishers, Amsterdam, the Netherlands.

Assies, W. (1997b). Noten, rubber en duurzame ontwikkeling in Amazonia. *Derde Wereld,*15(3/4): 309-327.

Assies, W. (1998). 'Niet-hout bosprodukten en duurzame ontwikkeling in Amazonia', in M. van der Glas (red.), *Duurzame landbouw in ontwikkelingslanden tussen theorie en toepassing.* ICCO/ CERES, Zeist/Utrecht, the Netherlands.

Barbier, E. B. (1987). The concept of sustainable development. *Environmental Conservation*, 14(2): 101-110.

Beekma, J., A. Zonta and Keijzer, B. (1996). *Base ambiental para el desarrollo del departamento de Pando y la provincia Vaca Diez.* Cuadernos de Trabajo no. 3, SNV, La Paz, Bolivia.

Beijnum, P. van (1996). *Problemática urbana, Riberalta.* Cuadernos de Trabajo no. 4, SNV, Riberalta, Bolivia.

Coesmans, K. and Medina I., M. del C. (1997). *Entre contradicciones y suerte; una mirada en la realidad cotidiana de las mujeres campesinas y quebradoras de Riberalta y sus alrededores*. SNV, Radio San Miguel, Riberalta, Bolivia.

Costa, I., B. da (1989). 'Esplendor e decadência dos seringais Acreanos', in O. Valverde (coord.), *A organização do espaço na faixa da Transamazônica, Vol. 2: Acre e Regiões Vizinha.* IBGE. Rio de Janeiro, Brazil.

DHV (1993). *Desarrollo de la Amazonia Boliviana. De la actividad extractiva hacia un desarrollo integral sostenible, resumen ejecutivo.* Proyecto de Desarrollo Agropecuario, Banco Mundial/Gobierno de Holanda, Bolivia.

Durham, W. H. (1995). 'Political Ecology and Environmental Destruction in Latin America', in M. Painter and W.H. Durham (eds.), *The social causes of environmental destruction in Latin America.* University of Michigan Press, Ann Arbor, USA.

Geffray, C. (1995). *Chroniques de la servitude en Amazonie brésilienne.* Karthala, Paris, France.

Hall, A. (1996). 'Did Chico Mendes die in vain? Brazilian rubber tappers in the 1990s', in H. Collinson (ed.), *Green Guerrillas.* LAB, London, United Kingdom.

IPHAE (1994). *Avaliação do Processamento da Castanha-do-Pará na Cooperativa Agroextrativista de Xapuri.* IPHAE, Porto Velho, Brazil.

LaFleur, J. R. (1992). *Marketing of Brazil Nuts.* FAO, Rome, Italy.

Léna, P. (1992). Expansion de la frontière économique, accès au marché et transformation de l'espace rural en Amazonie brésilienne. *Cahiers des Sciences Humaines*, 28(4): 579-601.

Martinello, P. (1988). *A `batalha da borracha' na segunda guerra mundial e suas conseqüências para o vale Amazônico.* Cadernos UFAC 1, UFAC, Rio Branco, Brazil.

Pacheco B. P. (1992). *Integración económica y fragmentación social: el itinerario de las barracas en la Amazonia Boliviana.* CEDLA, La Paz, Bolivia.

Ros-Tonen, M., Dijkman, W. and Lammerts van Bueren, E. (1995). *Commercial and sustainable extraction of non-timber forest products. Towards a policy and management oriented research strategy.* The Tropenbos Foundation, Wageningen, the Netherlands.

Stoian, D. and Henkemans, A.B. (1998). *Between extractivism and peasantry: differentiation of rural settlements in the Bolivian Amazon.* Paper submitted to the International Tree Crop Journal.

Veld, A. de (1998). *Fruits of the Amazon, socio-economic aspects of Brazil nut production and its contribution to sustainable development in North-West Bolivia*. MSc Thesis, Rural Development Studies, Wageningen Agricultural University/Programa Manejo de Bosques de la Amazonia Boliviana (PROMAB), the Netherlands/Bolivia.

Verheule, E. (1998). *Work and housing in the periphery of Riberalta, Bolivia.* MSc thesis, Human Geography of the Developing Countries, Utrecht University, the Netherlands.

Woortmann, E. F. (1996). *Família, mulher e meio ambiente no seringal.* Trabalho apresentado na ANPOCS, GT Família e Sociedade.