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"FOREST EXTRACTIVISM IN THE AMAZON : is it a sustainable and economical viable activity ?"

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Abstract:

'Forest extrativism' (i.e. the gathering of products in the native forest by the rural population) is presented as "..an alternative to contribute to the regional development for the Amazon ,based on a sustained yield output from the forest..". However ,by analyzing the major traded products, their gathering techniques range from harmless to even highly destructive . As long as population densities are very low and demand is modest, a certain equilibrium can be maintained. But when population density or demand for such products increases, exploitation quickly exceeds the natural recovery of the resources.

With the exception of some food items and the potential of phytopharmaceutical plants, most of the actual traded forest outputs are becoming obsolete .Their economic viability is decreasing or artificially maintained through subsidies as is the case for rubber.

For these promising products (like: food, nuts, fragrances, herbs,...) ,more efficient production techniques should be developed through agricultural or agro-forestry methods. In the long run, this would provide a much more "sustainable" alternative, and when fair trade relations would be included, in better living conditions for the rural population.

Introduction

Since a few years the forest "extractivism" activities (i.e. the gathering of products in the native forests by the rural populations) have gained considerable attention from several action groups in and outside Brazil. The land occupation process ongoing in the Amazon, characterized since the last decade by an aggressive deforestation, is under intense questioning (especially the cattle-raising projects). Therefore, alternative ways of regional development, causing less pressure for deforestation are proposed.

Forest extractivism is actually presented as one of these possibilities to "... contribute to the regional development with a sustained output of a variety of products without causing deforestation.." . Indeed, such activities are not eliminating the aspect of the forest cover ,as is the case with pasture or agriculture crops. However,the objective of this paper is to verify if the products actually obtained in this way can really be collected on a " sustained yield basis " and second, if these items are still commercially interesting .

The Amazon forest is a rich supplier of several raw materials like wood, edible nuts, fruits, game, fish, medicinal plants, gums, fibers,dyes, spices and so on. Generally wood is primarily concerned and viewed as the single, most obvious economical output from the native forests. However it is important to note that many "non-wood" products have, or had, a far larger importance in the regional development. The extrativism activities have been at the base of the Amazonian economy till the last two decades.A famous example is the "rubber-boom" , transforming Manaus into one of the richest cities of South-America , at the beginning of this century !

The majority of the rural population of the Brazilian Amazon (some 4 to 5 millions,IBGE 1987) lives from subsistence agriculture. For this people, the "gathering" of all kinds of products in the native forest is essential for their way of living. This assortment of gathered products is able to provide substantially in their immediate needs as well as serving as a source of cash-earning to complement their income. The gathering in the forest done by this people forms the base of the supply structure for the majority of all forest products.

Production figures for the Amazon are rare and often underestimated. For the scope of this work, only data on TRADED products ,obtained from the official IBGE institute (Brazilian Institute for Geography and Statistics) will be discussed.

NON-WOOD PRODUCTS

RUBBERS

The natural rubber is made from the white, creamy sap - or latex- of the "rubber tree". The best quality and highest yield comes from the Hevea brasiliensis (Euphorbiaceae), although some other Hevea species also supply latex (like the H. benthamiana,H.guianensis,...).

Hevea brasiliensis becomes more frequent and productive towards the south western part of the Amazon (Acre and the Beni region of Bolivia).This explains why the rubbertapping activities are more concentrated in these areas.

In the early days, the "seringueiros", or rubbertappers as they are locally called, slashed trees all round the trunk to remove the gum at once. This destructive method was soon abandoned in favor of a "tree- milking" process: an incision is made in the bark of a standing tree and the exuded sap is collected.

The rubbertappers and their families live along the rivers in these areas where rubbertrees occur more frequently in the forest (locally called "seringal"). Principally in Acre, the Beni region in Bolivia, south-west Amazonas, north-west of Rondonia, southern Para and in a much lesser extend in northern Mato Grosso and Amapa. In such a 'seringal ' a rubbertapper may have several paths in the forest going from one rubbertree to an other. Its length depends on the frequency by which rubbertrees are found in his area. It is usually as long that the tapper can complete his round in a single day. He makes an incision in the bark of a rubbertree and the latex exuded is collected in a recipient. The same trail is repeated after a few days , depending of the regeneration and production capacity of the trees . Rubber tapping is slowed down during the rain season , permitting the tapper and his family to spent more time on their crops , timber cutting ,or other activities .

Whenever the incision in the bark is too deep and harming the cambium layer (by an unexperienced or unattentive tapper), a callous wound tissue will grow and form an irregular bark surface , making it improper for further incisions. Due to decades of rubbertapping already, the lower part of the trunk of many older trees became useless so that tappers have to move upwards the stem to reach still smooth bark.

The seringueiro takes the raw latex home for coagulation. After eliminating impurities and the excess of water , he "smokes" it by pouring the latex on a turning stick over a fire till he obtains a large "rubber-ball" of approximately 30 kg. These rubberballs are then sold to intermediate traders and shipped to processing plants in nearby cities like f.i. Rio Branco, and Manaus. Actually the "smoking" process of the raw latex is abandoned, whenever possible in favor of the chemically coagulated rubber, which has a better and more uniform quality.

The rubber commerciatization mechanism, like for the other forest extrativism products as well, is controlled by intermediate traders. They dominate the supplies and transport to and from the riverine people in the region .This system is called locally "aviamento". The trade is on very disadvantageous terms for the tappers. They have to "pay back" their expensive rated supplies or advanced materials with their outputs (rubber and other forest/agricultural items) of which the value is kept unrealistically low by the traders . The construction (and pavement) of new roads (Porto-Velho Rio Branco f.i.) created alternative barter trade possibilities for the seringueiros .

Hevea brasiliensis latex is often mixed, either with latex from other Hevea spp. or from other Euphorbiaceae like the

Sapium and Micranda genera (Lescure et al.,1990) or from Brosimum spp. (Moraceae).

An other rubber source in the Amazon is the "caucho" or Peruvian rubber , as the tree is more frequent there .It is obtained by cutting down the caucho tree (Castilloa ulei - Moraceae), debarking the trunk and rolling up its elastical sap. Exploited in the same way is the "cauchorana" (Micranda spp. - Euphorbiaceae), which supplies a rubber of somewhat inferior quality. Caucho latex is often mixed with hevea and their logs are sold to the local plywood industry.

Due to its destructive and labor intensive extraction method,caucho rubber production is steadily disappearing. The output fell from 706 tons in 1966 ,to 200 tons in 1986 and 92 tons in 1987 . Output is almost exclusively from Rondonia.

Near all latex tapped in the Amazon is from native stands.Several attempts have been made to establish plantations of rubbertrees in the region,but with poor results. Either they got infected by pests or lost their economic viability. Examples include Fordlandia (1940's) , and more recently Hevea plantations set up during the last decade through financial incentives by Suframa or Sudam . Most of these plantations were abandoned as phytosanitary expenditures exceeded the expected production value of the latex.

Outside the Amazon region, new rubber plantations are becoming productive (Bahia, Mato Grosso,São Paulo), which put a serious threat on the economical long-term viability of rubbertapping in native forests (35.692 ha cultivated in 1987 with an output of 26.505 tons,IBGE).

Table nr:1 : Rubber production (tons) for the Amazon and their value (x1000 US$) for 1987.

state	1966	1976	1986	1987	value'87(1000$)US
Acre	9.715	7.823	14.173	14.490	8.187
Rondonia	3.295	1.097	7.890	4.665	4.322
Para	6.160	1.913	3.824	3.519	2.759
Amazonas	7.425	4.484	2.266	3.254	5.284
Amapa	194	-	447	493	162
Mato Grosso	1.548	-	138	20	22
Amazon	30.824	16.036	28.739	26.441	20.736

source: IBGE statistical yearbook 1989,1978,1968
note: value refers to the amount payed to producers
conversion factor: 1 US$= 41.46 Cr$
Banco Central, average for 1987

The latex gathering in native forests is probably one of the most traditional extrativism activities. However latex output is decreasing from 30,824 tons in 1966 to 26,441 tons in 1987 (US$ 21 million). The state of Acre ,despite its small size, is the

largest producer followed by Amazonas , Rondonia and Para. The production increase from Rondonia is partly coming from Acre (including even rubber from nearby Bolivia, whenever price conditions are more profitable). With the opening of the Rio Branco - Porto Velho road, the monopolistic position of the traditional traders weakened so that rubbertappers in these regions could sell their output at better prices along the road .

Productions figures from Para and Amazonas fluctuate. Often rubber from Amazonas is shipped and commercialized in Para at better prices. For the Amazonas State there is a general decline in the registered rubber output, partly because a share of its output is traded in other states (Lescure et al.,1990) ,but also due to a rural exodus in favour of Manaus.

The rubberproduction is recorded since the beginning of the 19th century . Output rose steadily to 42.286 tons at the height of the rubberboom in 1912. With the introduction of cheaper Malayan rubber, the Amazon rubber prices collapsed and output fell gradually from an average of 20.000 tons/year during the twenties, further down to about 12.000 tons/year in the thirties.

During the second World War , when the Asian supply was cut-off, there was a short upheavel. The output reached 21.192 ton at its 1944 peak. Since then natural rubber production oscillates between 15.000 to 30.000 tons/year;(some production figures f.i.:

1952: 30.342
69: 35.485
70: 52.190
74: 20.292
75: 14.291
77: 19.544)

The rubber price in Brazil is artificially kept at higher than world market prices in order to protect local production.In april 1990 the value of 'borracha ' (raw rubber) was : - at producers level: 40-60 Cr$/kg and at a factory in Manaus (including a first processing): 150-180 Cr$. (A Critica, april 1990 ; 1 US$ = 45 Cr$). The Amazonian output is not sufficient to satisfy national needs and Brazil imports natural rubber. For 1987 f.i., 90.383 tons of various kinds of natural rubber were imported from South-East Asia for a total value of FOB US$ 79.150.282 (Cacex,1989). Rubber consumption in Brazil for 1987 was 415.332 tons of which 273.584 synthetic, 10% recycled and the rest natural.

The number of rubbertappers was estimated at 68.000 by the last IBGE population census of 1980 . Violent conflicts between tappers and ranchers exist in these areas with land clearing for agriculture and pasture . The rubber tappers do legally not own the lands they exploit . The clearing of the forest, inclusive the rubbertrees eliminates their principal income source. In this way the concept of 'Forest Extrativism Reserves' was created to protect them. The first two such reserves were decreed in Acre by the governor in February 1988. In march 1990 ,3 more extractive reserves were established (Amapa, Amazonas and Acre) and other additional reserves are currently proposed for Acre, Rondonia, Amazonas and Amapa (Fearnside,1989).

GUMS

Gums are latexes that are not elastic . They can be separated in two groups:

1) "Balatas" : which become hard and are used as a "guta-percha" substitute (isolation for cables)

- "maçaranduba": This is the best balata quality and comes from the sap of the maçaranduba trees: Manilkara amazonica ,M. surinamensis and M . bidentata (Sapotaceae), provide the prime quality, while M. huberii is somewhat inferior.

- "balata (u)cuquirana": Chrysophyllum balata (Sapotaceae) supplies a balata of intermediate quality.

- "balata braba": consist of a mixture of the latex of "rosadinha" (Micropholis spp. - Sapotaceae) with "amapa" (Brosimum parinarioides) and "leiteira" (Brosimum potabile, - Moraceae). The result is a balata of lower quality. (The latex of "leiteira" is commonly used by the local people as a strengthening drink).

2) the "sorva" and "chicle" group : they are soft and used as a chewing-gum component. The most important one is sorva (Couma macrocarpa) and to a lesser extent C. guianensis and C. utilis (Apocynaceae). The first tree gives an abundant, sweet and slightly perfumed white latex. The chicle comes from Micropholis guianensis (Sapotaceae).

Gums are obtained either by tapping the sap of trees (Couma utilis), mostly by debarking parts of the trunk like for maçaranduba (in the Guyanas the balata is obtained by an incision process),or by cutting down the tree completely (sorva).

Blocks of hardened sap of sorva are wrapped-up with leaves and sold by the peasants to intermediates traders. At a processing plant in Manaus, the sap is washed ,cooked and further refined before its export to chewing-gum factories.

The production of non-elastic gums is of a more modest scale and oscillate between 3000 to 7000 ton/year. Sorva is the main output .

Table 2 : production of gums (tons) with their values for 1987.

type of gum	1966	1976	1986	1987	value'87 (1000US$)
balata	621	513	22	19	11
maçaranduba	849	514	376	298	239
sorva	3.130	6.197	3.002	1.524	316
cuquirana	364	73	-	-	
total	4.964	7.297	3.400	1.841	566

source: same as for table 1. (idem for following tables).

The Amazonas state is the principal supplier and almost exclusively of sorva (the remaining sorva is coming from Roraima) . The other gums are mostly from Para but their output is becoming insignificant .

Table 3 : gum production by state (tons).

state	1966	1976	1986	1987
Amazonas	3.438	5.840	2.859	1.439
Para	1.361	1.018	401	317
Roraima	102	388	140	85
Rondonia	55	43	-	-
Amapa	8	8	-	-
Amazon	4.964	7.297	3.400	1.841

FIBERS

Fibers are provided by many plants like vines ,trees (bark), palms, etc. The indigenous peoples from the Amazon master several techniques to obtain these natural fibers and use them for a wide variety of purposes like cords, brooms, hammocks, utensils, clothes, masks, construction materials etc. Many of these fiber uses have been taken over by the rural population living in the area now. These fibers may be very important for their daily-life , but only a few enter in the regional commerce and are traded as a cash-earning, like f.i.:

-"piaçava" : Leopoldinia piassaba (Palmae): its tough fibers serve for brooms .
-"buriti" : Mauritia flexuosa (Palmae) : fibers from its leaves are used for cords.
-"tucum" : Astrocaryum spp. (Palmae) fine fibers used for hammocks, clothes etc.

Of these examples only natural stands are tapped. Regularly the large bottom leaves are cut, without harming the tree. The fibers are extracted from the large petioles.

This process does not cause severe pressure on the natural stands of these palmtrees. On the contrary, the peasants tend even to protect them.

Buriti fibers are principally used in Para and to a lesser extend in Maranhao with a production (1987) of 900 and 236 tons respectively.

Piaçava fibers are coming from the upper Rio Negro (Amazonas state). Piaçava fibers are in fact becoming obsolete due to synthetics. They are still used by the regional broom manufacturing , but their export is decreasing from 203 tons in 1978 to 38 ton in 1988.

A much more important fiber in the regional trade is the malva (Urena lobata - Malvaceae). This riverside annual plant,

resembling closely at juta was formerly obtained by forest gathering but is now an agriculture cash-crop. In 1987 malva fiber production was 46.141 tons with a value of 16,2 million US$, (the jute output of the region for the same year was 19.487 tons, valuated at 5,6 million US$).

Table 4:Fiber production in the Amazon (tons) and values for 1987.

type	1966	1976	1986	1987	value (1000 US$)
buriti	-	865	1.138	1.136	413
piaçava	2.030	1.871	303	562	151
tucum	11	9	-	-	-
					564

OILS

Oils are extracted from many plants, mostly from the seeds, (like Virola, Andiroba) but from other parts as well (wood f.i.). They may be used as a cooking -, aromatic- ,fuel- or medicinal oil and serve as a raw material for the manufacture of other products like soap f.i. . By far the most important one is the babaçu palm.

- "babaçu" : Orbignya speciosa (Palmae). Almost all parts of this palm tree are used in the rural ,poor areas of Maranhão. Here it occurs in large ,almost pure stands, and is often the only "tree" available . These babaçu stands are of andropogenic origin. The original vegetation in this area was a semi-deciduous dry-forest rich in babaçu palms. Through the repeated action of burning the forest ,broad-leaved trees were suppressed, while the more fire resistant babaçu palm survived.

Oil is extracted at many small distilleries from the fruit kernel. The fruit mesocarp provides a manioc-like flour and the shell gives an excellent fuel and charcoal. The babaçu palm is an important element for these rural populations. The leaves are woven into all kinds of utensils, panels and roof cover. The trunk supplies lumber and poles. The babaçu palms are even protected by the rural population and by tradition they may collect fruits or leaves from any tree,even these on privately owned ranching-lands (the babaçu system here is in fact much more an agroforestry - then a forest extrativism activity !).

The production of babaçu oil , although still important ,is decreasing, from 174,000 tons in 1976 to 147,287 in 1987 (US$ 22,6 million). The largest producer is the state of Maranhao: 147.241 tons of oil (1987), followed by Tocantins :35.721 t. and Para with 42 tons. Charcoal from the shell is exported .

-" andiroba" : (Carapa guianensis - Meliaceae) is a large tree , common on riverbanks . It is very well known for its excellent timber . Oil is extracted from its seeds, and used for a wide variaty of applications (medicinal, soap,...). The trade in andiroba oil is rather limited .

- " copaiba" : (Copaifera multijuga, C. spp. - Caesalpiniaceae) The wood of the copaiba tree contains an aromatic oil that may accumulate in internal cracks of the trunk. To release the oil, peasants will drill a hole in the trunk of a standing tree . The tree can be harvested again later, when this hole is shut off with a tap so that the oil won't drop out.Sometimes peasants use an ax, by lack of a drill, to cut a hole in the trunck and release the oil. This practise seriously damages the tree and does not permit an next harvest .

Copaiba oil is used for several applications, ranging from a medicine to a gasoil substitute. The Amazonas state is the largest producer (90 tons in 1987).

Table 5 : production of oils (tons) with their value of 1987.

type	1976	1986	1987	value (US$1000)
babaçu	173.998	142.507	147.287(*)	22.631
copaiba	26	43	108	123
andiroba	302	-	-	
cumaru	15	457	332	224
licuri	-	4.642	3.828	185
				23.162

(*) the Tocantins production of 35.721 ton is not included here

- " cumaru ": Dipteryx odorata + D. spp. - Fabaceae. This large tree is common all over the Amazon. From its seeds, the kernel is collected and exported . The extracted cumarine serves as a fragrance for tobacco flavouring. Output is principally from Para.

-" licuri" : Syagrus coronata, Palmae . This palmtree bears a large fruit with 4 kernels inside, of which oil is extracted. The kernel shell is very hard and used for a variety of fantasy objects. The tree is common in Acre and Bahia.

- " pau rosa" : Aniba duckei + A. rosaeodora- Lauraceae . The wood of these trees has a very strong aromatic scent due to the high linalol content. The exploitation process is very destructive : trees are felled, trunk and branches are cut to pieces and the linalol is extracted by distillation either in a nearby city or in the forest itself in a mobile and primitive extraction plant. The obtained essential oil is collected in barrels and exported.

Already for more than a century, essential oil is extracted ,without any replanting. This process has seriously depleted the stock of pau rosa trees in the accessible forests of the region. Pau rosa extraction is a very labor-intensive work, but the exported fragrance gets a high price. For example in 1978 and 1988 respectively 117 and 40 tons were exported for a total US $ FOB value of 1.262.918 and 928.783. The natural obtained linalol

suffers from severe competition from the synthetic and its output is declining. It is now mostly used by the parfume industry .

FOOD

Food is by far the largest 'non-wood' forest product contributor, either by edible nuts, fruits, palm-hearts, game, fish and so on. Most of it is consumed on the spot or within a very limited radius .Only a few items are widely traded and even exported like : Brazil-nuts, palm-hearts and açai-fruits. Data on fish, game and other forest fruits (pupunha, buriti,...) are not sufficiently known and thus not included here.

- " açai ": Euterpea oleracea - Palmae. Açai is a medium sized palmtree, very common and growing gregarious in large , dense stands along river banks of the Lower Amazon . Dubois (1989) mentioned that a previous exploitation of virola trees in these areas opened up the canopy and caused althus an increase in the açai population. The açai seeds are collected and used to prepare a purple to dark-brown , very popular juice. Açai also supplies an excellent palmito.

Although the consumption of açai juice in the Amazon dates from pre-colonial times, its importance in the regional trade is very recent. In 1966, açai production was not yet even recorded by IBGE .By 1976, production rose to 18,743 tons , 50.071 in 1978 and increased further to 145,881 tons by 1987 . The state of Para is the major producer with 94% of total output, followed by Amapa and Maranhão with 3% and 2% respectively. The gathering of the seeds does not deplete the Açai resources.

- " Palm-hearts" or 'palmito' : Several palm species supply palmito, however Açai is the most preferred one.To harvest the palmito, which is the edible part at the top , the palmtree has to be cut down . The green part of the trunk's top, just under the leaves ,is taken out and sold to palm-hearts canneries. Only natural stands of palm trees are tapped and no plantations exist. The state of Para is the largest producer with 94% of the total output of the region (rest from Amapa). By 1974 palmito output in the Amazon was 24.332 tons. Production reached its highest levels from 1975 to 1979 (average of some 200.000 tons/year) and is decreasing since then ('80: 114.408 tons).

Output in 1987 was 138,824 tons (US$ 12 million). The palmito gathering is depleting palm stands as the tree is cut down (with the exception of Açai since farmers now earn more with its seeds).

- "Brazil-nuts" : (Bertholletia excelsa - Lecythidaceae) . The "castanheira " as this big tree is called , produces every year cannon-ball sized kernels with 10 to 15 large nuts inside. The kernels are collected by the peasants and cut open to free the nuts , which are sold to local traders. In the cities the nuts will be further processed and prepared for local consumption or export.

The range of the castanheira tree covers almost the whole Amazon basin. The brazil-nut production suffers from deforestation in the region . By law it is forbidden to cut castanheira trees but this protection is not effective.

The gathering of nuts of the castanheira tree already existed well before colonial times. Trade of Brazilnuts took off since the beginning of this century and reached its highest levels from 1965 through 1977 (some 50.000 tons/year . Output is gradually decreasing since, to some 36.241 tons in 1987 of which half is from Para, followed by Acre (24%), Amazonas (15%), Amapa (5%) and the states of Roraima, Rondonia and Mato Grosso with approximately 2% each.
A few plantations of grafted or selected castanheira trees exist.

Table 6 : production of Açai, Brazil-nuts and palmito (tons) with their values for 1987 (in US$ 1.000).

	1955	1966	1976	1986	1987	value
acai	-	-	18.743	137.595	145.881	42.023
brazil-nuts	35.593	55.470	61.044	36.136	36.241	9.070
palm-hearts	-	-	197.696	124.314	138.824	11.823

MEDICINAL PLANTS

The use of native plants for therapeutic purposes is of great importance to the local population. Innumerable species are locally known ,used and commercialized in the region through the 'parallel' economy .The IBGE has some limited data on a few traded plants like for instance : jaborandi (Pilocarpus pinnatifolius), ipecacuana (Cephaelis ipecacuanha), the collorant urucu (Bixa orellana),ichthyocides as timbo (Derris spp.) and a tannin plant angico (Piptadenia spp.).

Their combined production (mostly of jaborandi from Maranhão) for 1987 was 1.627 tons with a total estimated value of 905.475 US$. The jaborandi is exported to a pharmaceutical company. The gathering of the jaborandi leaves is done by cutting down branches or even the whole tree .

WOOD - PRODUCTS

Wood (incuding firewood,charcoal and saw /peeler logs) is by far the largest output of the forest. For 1987 the total estimated output from the Amazon region was 204.000 tons of charcoal, 17 million m3 of fuelwood and some 29 million m3 of

Table 8 : Charcoal and fuelwood output for 1987.

state	charcoal (tons)	fuelwood (1000 m3)
Para	33.982	7.341
Maranhão	165.977	7.239
Acre	1.932	1.293
Rondonia	1.473	1.065
Amazonas	-	-
Amapa	622	459
Roraima	36	66
Amazonia	204.022	17.463
value(in 1000 US $)	15.892	48.002

Production of industrial logs for 1986 and 1987.

State	1986 (1000 m3)	1987 (1000 m3)	value for '87 in 1000 US $
Para	18.416	21.000	813.186
Rondonia	2.735	2.552(*1)	137.619
Mato Grosso	1.527	1.399	33.679
Maranhão	1.370	1.092	21.996
Amapa	421	472	2.222
Acre	281	292	4.449
Amazonas	340	241(*2)	3.428
Roraima	44	48(*3)	2.193
Goias(**)	1.555	1.464	30.261
Amazonia	26.691	28.560	1.049.033

source: IBGE yearbook of 1989
exchange rate : 1 us$ = 41.46 Cr$

Remarks: the official data are underestimated. Total output of of industrial logs would be closer to 42 million m3.

(*1) production estimated by author at 15 million m3 as sawnwood output alone (by IBDF data) is 6,359 million m3.

(*2) " " " 1 million m3 sawnwood output (IBDF): 313.000m3 ,rest plywood

(*3) " " " 100.000 m3 sawnwood output (IBDF): 36.000 m3, " "

(**) partly within Amazonia,(Tocantins) sawlogs are of Amazonian species.

industrial logs, with a total combined value at producers level of US$ 1,1 billion (IBGE,1989). It is an important contributor for extra-cash income for the rural population.

Although nearly all of it is coming from native forests, only a small part is really obtained by forest extractivism activities ,i.e., the log production from the varzea forests and some limited manual logging on terra-firme lands. Varzea logging is the main source of saw- and peeler logs for the state of Amazonas and for the Lower Amazon river varzea's in Para.

The majority of the wood production ,given by table 8 ,is coming from deforestations or commercial logging and can thus not be considered as a forest extrativism activity.

As it is practiced today and with the ever increasing demand levels from the wood industry, the forest extractivism methods to gather logs in the varzea and terra-firme forests became in fact a destructive process for the resources (not for the forest aspect !) .Decades of highly selective logging resulted already to a gradual depletion of the major commercial species in large parts of the accessible Amazonian old-growth varzea forests (e.g.: virola, saboarana, macacauba,muiratinga, etc). As soon as the commercial stock of a species approaches its depletion , exploitation pressure swift to (an) other(s).

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Export values for 1988 of the main forest extrativism products(wood not included) was calculated by Benchimol (1989) at approximately 50 million US$ (Table 9).

Table 9: Export value of non-wood forest products for 1988.

product	value (1000 US $)	tons
canned palmito :	25.000	6.400
brazil-nuts :	20.500	14.800
sorva :	2.200	675
'pau rosa'(fragrance):	929	40
ornamental fish :	614	-
copaiba balsam :	244	59
piaçava :	36	38
cumaru (kernels):	24	5

source : elaborated by author based on data from Benchimol (1989)

CONCLUSIONS

The total value of the recorded 'non-wood ' products , obtained by forest gathering and traded in the Brazilian Amazon amounts to US$ 110 million for 1987 (source IBGE). By order of importance are :açai (42 million US$) ,babaçu (22 m.$) , rubber (20.7) , palm-hearts (11,8 m.$) ,brazil-nuts (9 m.$), and sorva (1,2 m.$). They are followed by several other products with values lesser than US$ 1 million each :

- gums and waxes: balata,licuri...
- fibers: buriti,piaçava,tucum...
- oils: andiroba,virola,licuri,...
- medicinal plants:jaborandi,ipecauanha,timbo...

It must be reminded that the IBGE statistics cover only partially the contribution of these products as many are commercialized through the 'parallel' economy.

Trade of 'non-wood' forest products is still important in some subareas like f.i. :the State of Acre and parts of the Amazonas State.

For the Amazon region the extractivism in its actual terms and products is slowly but definitely becoming an obsolete economic activity . With no doubt it is still very important to provide in the domestic needs of the rural population, however, **as a regional element for trade and thus as an extra cash income** , its importance and commercial appeal is declining fast. The reasons are manifold:

- **substitution** by synthetic's, making the product obsolete, f.i. : balata, gums, fibers,

- products are now supplied by **plantation agriculture** on a more efficient way: malva, guarana, fruits, rubber, etc.

- the **destructive gathering methods** decimated the available stock, case of jaborandi, balata, caucho, palmito, pau-rosa, and the industrial commercialized species of the varzea forests like virola, etc.

- **deforestation** in the area reduces the potential supply: brazil-nuts, rubber, andiroba, copaiba,

- **the rural exodus** ,leaving large parts of the Amazon with fewer peolpe to provide the products, specially for the state of Amazonas.

- **unfavourable trade mechanisms** for the rural producers, diminishing the incentive to produce . Value of products accrues to intermediaries.

The artificial maintenance of forest extractivism systems in its actual terms (by e.g.: "extractivism reserves"), would be in fact a guarantee for poverty and hardship for the people who practice it. Even more ,with only a few exceptions (açai,nuts,rubber) the gathering techniques are highly destructive . As long as population densities are very low (about 1 to 2 persons/km2) and demand for these products is modest, a certain equilibrium can be maintained.But when population densities or demand increases , exploitation quickly exceeds natural recovery of the resources.

For these promising products like food,nuts..for instance, more efficient production techniques should be developed through agricultural or agro-forestry methods. This would provide ,in the long run ,in a much more "sustainable" alternative and when fair trade relations would be included ,in better living conditions for its people.

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