

FINAL DRAFT

The Impact of Certification on the Sustainable Use of Brazil Nut (*Bertholletia excelsa*) in Bolivia

PREPARED FOR

**The Food and Agriculture Organisation of the United Nations
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BY

Marcelo Paz Soldán¹

UNDER THE SUPERVISION OF

Sven Walter²

Please send comments on the paper to
Sven Walter at Sven.Walter@fao.org

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¹ NUEVO MILENIO (Cochabamba, Bolivia), Av. Santa Cruz No. 1274. Edificio Commercial Center. Piso 7. Of. 2, Tel : +591 4 4401004 Fax : + 591 4 4401003, E-Mail : mpazsoldan@mpd.ucb.edu.bo

² FAO, Forest Products and Economics Division, Non-Wood Forest Products Programme, Viale delle Terme di Caracalla, 00100 Rome, Italy, www.fao.org.

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LIST OF ABBREVIATIONS

ABAN	Asociación de Beneficiadoras de Almendra del Noroeste (Northwestern Brazil nut <i>Beneficiadoras</i> Association)
AGRECO	Kontrollstelle für ökologische Lebensmittel und Naturwaren
AOPEB	Asociación de Organizaciones de Productores Ecológicos de Bolivia (Association of Organization of Ecological Producers)
Bolicert	Boliviana de Certificación
BOLFOR	Programa de Manejo Forestal Sostenible
CAIC	Cooperativa Agrícola Integral El Campesino
CBI	Centre for the Promotion of Imports from Developing Countries
CEDLA	Centro de Estudios para el Desarrollo laboral y agrario
CFV	Consejo Boliviano para la Certificación Forestal Voluntaria (Bolivian Council for the Voluntary Forestry Certification)
CIFOR	Center for International Forestry Research
CIOEC	Comité Integrador de Organizaciones Económicas Campesinas de Bolivia
CUMAT	Capacidad de Uso Mayor de la Tierra
DIPO	Danish Import Promotion Office
EEC	European Economic Community
EFTA	European Fair Trade Association
ERR	Environmental Rate of Return
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FLO	Fair Trade Labeling Organization
FOB	Free on Board
FOBOMADE	Foro Boliviano sobre Medio Ambiente y Desarrollo
FSC	Forest Stewardship Council
FSUTCP	Federación Sindical Única de Trabajadores Campesinos de Pando
GDP	Gross Domestic Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HACCP	Hazard Analysis Control Point
IBNORCA	Instituto Boliviano de Normalización y Calidad (Bolivian Quality and Normalization Institute)
IMO Control	Institut für Markökologie, Kontroll- und Zertifizierungsstelle im Ökologischen Landbau
IFOAM	International Federation of Organic Agriculture Movements
INE	Instituto Nacional de Estadísticas (National Statistics Institute)
IRR	Internal Revenue Rate
ITC	International Trade Centre
ISO	International Standard Organization
JETRO	Japan External Trade Organization
JNA	Japan Nut Association
NWFP	Non-Wood Forest Products
NOP	National Organic Program
NORAD	Norwegian Agency for Development Cooperation
OSEC	Swiss Office for Trade Promotion
PROMAB	Programa Manejo de Bosques de la Amazonía Boliviana
SENASAG	Servicio Nacional de Seguridad Agrícola y Ganadería (Agriculture and Cattle Raising Security National Service)
SGS	Société Générale de Surveillance
SIDA	Swedish International Development Cooperation Agency

SNV	Stichting Nederlandse Vrijwillige
UNCTAD	United Nations Conference on Trade and Development
USFDA	US Dried Fruti Association
TCO	Territorios Comunitarios de Origen
WTO	World Trade Organization
WHO	World Health Organization

*Picture of a bright blue ball just spinnin', spinnin' free. Dizzy with eternity.
Paint it with a skin of sky brush in some clouds and sea. Call it home for you and me.
A peaceful place or so it looks from space. A closer look reveals the human race.
Full of hope, full of grace is the human race. But afraid we may lay our home to waste.
Grateful Dead*

1. GENERAL OVERVIEW OF THE USE OF BRAZIL NUTS IN BOLIVIA

This section provides an overview of the status of the brazil nut, taking into account its ecological, social, economic, technical (processing) and institutional aspects.

1.1 The Amazon region: its importance to the world ecological system

The Amazon River runs more than 6 400 km across northern South America, from the highland biomes in the foothills of the Andes Mountains to the Atlantic Ocean. It carries twenty percent of all river water discharged into the earth's oceans². From December to May each year, the combination of torrential rains and snow melt increase the main river channel's depth from 9 to 14 meters. The additional water causes back-ups in tributaries and inundates forests several kilometres from the main channel. In the central Amazon Basin alone the floodwaters can cover an area of more than 250 000 square kilometres. The river and the flooded forests then come together as a giant, slow-moving swamp.

Surrounding these waters are over 7 million square kilometres of lush forest teeming with life. In fact, it has been estimated that as many as one half of all life forms on the planet live in the Amazon River Basin³.

In addition to providing a habitat for millions of species, the Amazon is also a climate regulator as it absorbs and stores moisture. The Amazon forest canopy is so dense and so biologically productive that scientists have also recognized the region as a key component of the global carbon cycle.

Since 1987 more than 492 228 square kilometres of forest have been cleared in the Amazon Basin, and 19 948 additional square kilometres are being cleared each year⁴.

1.2 The Bolivian Amazon region

This is a generally humid region with an area of 280 000 square kilometres, 79 percent of which (221 000 km²) is covered by forest. The forests in the region have a potential average timber production of 11 to 14 m³/ha/year. Within the Bolivian Amazon Basin two different kinds of formations can be distinguished: i) the Amazonian, with an almost flat, undulating topography, covered by dense, evergreen forests, displaying a great diversity of species; and ii) the plains of Beni, constituted by grassy savannas occasionally interrupted by a series of gallery forests and forest islands. The plains are gently undulating fields characterized by poor drainage, temporary flooding and a minimal presence of commercial species. In spite of the acidity of its soil, the plains are greatly valued as a foraging area because of their vast natural pasture prairies which are well-suited to cattle raising.

² Lindsey (2002)

³ Lindsey (2002)

⁴ Lindsey (2002)

1.3 Area of production

The brazil nut is the fruit of the *Bertholletia excelsa* tree, found in its natural and wild form in the Amazon forests of Bolivia, Brazil and Peru. While also found in Guyana and Colombia, it constitutes a commercial product only in the former three countries. The growing regions are characterized mainly by their humid conditions. Even though the *Bertholletia excelsa* tree may grow in other tropical regions, it will not produce fruit because fruiting is dependent on the presence of other vegetal and animal species that contribute to its pollination.

In Bolivia, suitable tropical regions cover an area of approximately 100 000 square kilometres, or about 10 percent of the Bolivian territory, and are found to the north of the country. They include the Department of Pando (63 827 km²), a section of the Department of Beni in the Province of Vaca Diez (22 424 km²), and a section of the Department of La Paz in the Province of Iturrealde (13 749 km²).

Map 1. Map of the Bolivian Amazon Region.



Brazil nut exploitation and processing represents more than 75 percent of the gross domestic product (GDP) of the production area of the northern region of Bolivia. The small city of Riberalta, located along the Madre de Dios River, is the most important processing centre.

1.4 Main stakeholders involved in the production, processing and trade of brazil nuts

The sector associated with the production and exploitation of brazil nuts is very important, especially in northern Bolivia, where more than 50 percent of the population derive their livelihood from this crop. In 2001, the sector generated US\$27 million in exports. The extraction and processing of brazil nuts is an important source of work for 8 to 9 months of the year when approximately 15 000 people in Bolivia participate in harvesting.

There are four important elements related to the brazil nut market:

- The processors (*beneficiadoras*)
- The concession holders (*barracas*)
- The intermediaries (*contratistas*)
- The harvesters (*zafreiros*)

The processing plants are industrial plants where brazil nuts are processed for export. There are 24 processing plants in Bolivia, 20 of which are located in Riberalta. These 20 plants provide employment for 2 500 nut crackers (*quebradoras*), 4 000 helpers in the breaking process, 650 permanent manufacturing workers and 1 300 temporary workers (*eventuales*). The remaining four processing plants are located in Cobija, La Paz and Cochabamba, thus creating an important market for temporary workers of the migrant population of the tropical forest.

The concessions are administrative units for the exploitation of brazil nuts which vary in size between 5 000 and 500 000 ha. There are currently between 180 to 240 *barraca* owners in the region. In the last ten years, a process of vertical integration has been observed in which ownership of *barracas* has been transferred to the processing plants. Some peasant producers own small parcels of land between 30 to 100 hectares, which they harvest at a family level. Because there is no legal ownership security, land tenancy becomes a problem and the government has started a process to clearly define land tenancy (*saneamiento*).

It is estimated that the processing plants and the *barraca* owners annually hire approximately 15 000 brazil nut harvesters during the harvesting season. The hiring process (*habilito*) is carried out with the participation of an intermediary and is an informal contract system in which a *beneficiadora*, *barraquero* or contractor advances a brazil nut collector a sum of money based on future production.

The harvesters are peasants and indians from Pando who live in the Amazon forest and for whom the harvest of nuts constitutes their main income source. In the past, during the peak of rubber collection, these populations were forced to extract latex, a form of work that cost many of them their lives. With the shift away from rubber extraction, the peasants turned to brazil nut collection and processing and thus the system was built upon the ancient one.

Chart 1. Support services for brazil nut processing plants



Support services for the brazil nut processing plants (beneficiadoras)

Source: www.infoagro.gov.bo

Made by: Marcelo Paz Soldán

Support services for brazil nut processing include raw material input (e.g. corrugated carton boxes, bags of 25 kg), research into reducing aflatoxins levels and local and international transport (see Chart 1 for complete schematic). All of these services revolve around the processing plants, which are the driving force in the Bolivian brazil nut industry.

1.5 Ecological aspects

As the brazil nut tree is part of a very complex and inter-connected eco-system, all efforts to plant the tree outside the Amazon basin (e.g. Malaysia, Sri Lanka, Indonesia, the West Indies) have failed. The main reason for this failure is the specific fruiting requirements of the brazil nut tree; only one bee species can fertilize the tree's flowers. The male of this bee species depends on the Amazon forest to provide the chemical substances that allow its wings to glitter under the sun. These chemicals are produced by five different plants that grow only in this region. When a group of males gather, female queens are attracted to the glitter of their wings and are fertilized. In an artificial plantation, not enough bees are available and therefore the crop is reduced. Brazil nut trees flower at the beginning of the rainy season; each flower lasts just one day.

Hiber, a botanist, discovered the way the seeds are scattered in 1909. Only one rodent, the agouti (*Dasyprocta sp*), is capable of opening the cap of the very hard outer shell. When the mature pods fall in the rainy season⁵, the rodent eats some of the nuts and the rest are buried in the forest and forgotten. The uneaten, buried seeds become the next generation of brazil nut trees. Hence, it may be said that the brazil nut tree is completely dependent on one animal, the agouti, for the disbursement of its seeds (Levy. March 1990)⁶.

As the species *Bertholletia excelsa* requires a lot of light, it grows up to 20 meters over the forest canopy and can reach heights of up to 40 to 50 meters. Some brazil nut trees may

⁵ Enrique Ortiz. Brazil nut history revealed. http://inc.treenuts.org/amazonia_history.html

⁶ The agouti turns out to be a major player in the history of brazil nut. By burying the brazil nuts, agoutis hold the key to the tree's survival in remote areas. The agouti is virtually the only animal that has the teeth strong enough to open the thick husk and liberate the seeds so they can sprout.

reach an age of between 100 and 150 years and a diameter of 2 to 3 meters at their base. They tend to grow in forest clearings with a density of one tree per hectare. In some places, it is possible to find up to 13 trees per hectare. It has been observed that reduced yield of fruit occurs when surrounding forests are cut down⁷.

Another factor that makes the brazil nut tree unsuitable for plantations is the fact that it takes an average of 45 years for the trees to mature to the fruit-producing stage. As previously mentioned, the brazil nut tree cannot be developed in plantations because it depends on other forest species for its pollination and fruit production. When forest conditions are altered, the production of fruit quickly declines due to the tree's dependence on the associated biota.

1.6 Forestry aspects

Recently, Bolivian basin forests have experienced an accelerated degradation consisting of the impoverishment of existing forest areas or the altering of original forest conditions. This is a direct consequence of the commercial exploitation of wood which has typically been done in a manner that is incompatible with the preservation of biodiversity and natural ecosystems and has resulted in the progressive reduction of genetic diversity and biomass.

Historically, the decrease of forest areas in the Bolivian lowlands was found to be lower than the deforestation levels of other countries with tropical forests. A study carried out by the CUMAT (Capacidad de Uso Mayor de la Tierra) in 1998 presents the most reliable estimate for the Bolivian lowlands. According to the study, until 1990 only 5.9 percent of the total amount of primary forest (2.4 million ha) had been destroyed for agricultural and other purposes. However, in recent years, deforestation rates have experienced an exponential growth, almost doubling the rates reached in the 1990s with respect to the preceding decade⁸.

The brazil nut production area's ecosystem is suffering a drastic change and is losing the base of its resources due to the fact that peasants are following a process of land occupation which results in the destruction of large forest areas and the introduction of livestock⁹.

Despite the fact that brazil nut collection requires the collectors to remain in one area for periods of 3 to 5 months a year, it does not greatly alter the forest ecosystem. In fact, because of its reliance on the forest ecosystem's survival and prosperity, the harvest depends upon the conservation of the tropical forest. On the other hand, however, there are families who hunt indiscriminately in order to survive, thus altering the forest ecosystem.

1.7 Social aspects

In addition to its ecological importance, the brazil nut has great social importance as many people in Bolivia, Peru and Brazil depend on its collection for their livelihoods. In Peru alone there are approximately 1 000 brazil nut concessions in the Tambopata National Reserve. When offshoot activities such as transportation and processing are considered, the brazil nut industry generates employment for some 20 000 people, which corresponds to 20 percent of the Amazonian state of Madre de Dios in Peru¹⁰.

7 Levy M. America "Brazil nuts" Save the Amazon Forest. March 1990.

8 Pacheco B., P. 1998. Estilos de Desarrollo, Deforestación y Degradación de los Bosques en las Tierras Bajas de Bolivia. Serie Bosques y Sociedad No 2. La Paz. CIFOR, CEDLA and TIERRA.
<http://www.students.clarku.edu/~ppacheco/page4.html>

9 Pacheco B., P. 1998. Estilos de Desarrollo, Deforestación y Degradación de los Bosques en las Tierras Bajas de Bolivia. Serie Bosques y Sociedad No 2. La Paz. CIFOR, CEDLA and TIERRA.
<http://www.students.clarku.edu/~ppacheco/page4.html>

10 Boyd S., The nut that could help save the Amazon. www.panda.org

As the harvest period coincides with the rainy season, collection is remarkably difficult and collectors and their families face a great number of dangers and obstacles. In spite of the adverse conditions, in Bolivia more than 15 000 people every year go deep into the forest and do not come out until February or March. From March to December a part of the same labour force that participated in the collection moves to the processing plants as more than 5 000 workers are needed for the processing stage.

The disperse collector communities of the Amazon are mainly concentrated in areas of higher road density, generally in the vicinity of the principal urban centres of Riberalta and Cobija. These are mainly subsistence-economy units that clear between 1 and 2 hectares of forest per year for crop production (i.e. rice, followed by corn and finally fallow).

According to Stoian (2000), "employment in the Riberalta-based processing plants (*beneficiadoras*) stands out among the economic activities of females in the peri-urban households: 27 percent of the female household heads and spouses secure regular employment in one of the plants. If only accounting for the economically active among the spouses, as much as 48 percent are employed in a *beneficiadora*. The most important occupation in the *beneficiadoras* is that of the *quebradoras*". Unlike the graders, the *quebradoras* do not receive a monthly wage¹¹ but are paid on a piecework basis. This payment system explains why they involve other household members, in particular children above the age of eight or ten who assist their mothers upon their return from school. The working day is monotonous and strenuous: average *quebradoras* work 12.9 hours a day. In contrast, the women in charge of grading typically work between eight and ten hours a day¹².

1.8 Economic aspects

The mean annual production of brazil nuts is estimated by FAOSTAT (2003) at 62 000 tonnes (1997-2002). The main producing countries are Bolivia (48% of world production) and Brazil (43%) and the main consumer countries are the United States (36% of world imports in 1997-2001) and the United Kingdom (18%). The mean annual export value is estimated at US\$66 million (1997-2001).

Table 1. Production of and trade in brazil nuts (1997 – 2002)

		1997	1998	1999	2000	2001	2002
Production (t)	World	51 506	44 142	62 556	75 156	68 750	67 750
	Bolivia	23 000	15 400	30 000	36 000	36 000	36 000
	Brazil	22 786	23 111	26 856	33 431	27 000	26 000
Export (t)	World	28 550	30 724	28 301	44 341	35 577	
	Bolivia	9 834	9 950	11 406	13 805	13 334	
	Brazil	14 661	15 128	6 106	18 928	10 552	
Export (US\$1 000)	World	67 649	65 279	66 410	80 301	51 584	
	Bolivia	30 711	28 257	30 889	33 803	26 561	
	Brazil	26 075	21 181	11 095	27 686	11 149	
Import (t)	World	31 036	29 412	24 546	35 911	30 763	
	USA	11 251	9 595	8 643	13 833	11 792	
	UK	5 695	4 860	5 130	6 017	5 374	
Import (US\$1 000)	World	82 702	70 485	66 267	77 526	58 567	
	USA	28 179	21 883	22 061	29 159	20 595	
	UK	16 531	12 540	14 229	14 113	11 143	

Source: FAOSTAT (2003)

11 Clasificadoras receive a monthly wage but have to grade a minimum of 10 boxes (20 kg each) a day. This amount can rather easily be accomplished, and those who wish to earn "extra" are paid per piece for each additional box (Coesmans and Medina 1997:163)

12 Stoian D., Variations and dynamics of extractive economies: the rural-urban nexus of non-timber forest use in the Bolivian Amazon. Albert-Ludwigs-Universitat Freiburg. 2000.
<http://www.gis.net/~ppacheco/Stoian%202001%20Extractive%20Economies%20-%20Bolivian%20Amazon.pdf>

Although the majority of Bolivian brazil nuts are exported, the brazil nut does not constitute a very large trade as it represents only one percent of the international nut market and commercialization which totals US\$4 000 million annually. As 99 percent of the production is exported, the Bolivian market is very reduced: under one percent of total production is consumed locally.

The economic problems faced by brazil nut producers are related to the continuous reduction of its price together with the restrictions by international (mainly European) importers imposed on exporting countries.

Although there are no official international or national standards for edible nuts, importers and food processors in Europe have their own strict standards and specifications, which are set against the background of stringent health and safety regulations. Compliance with these quality standards is essential, as failure to do so results in goods being refused, or accepted, but only at considerably lower prices, for further processing.

For EFTA¹³ producers the quality standards for edible nuts issued by the United States Dried Fruit Association (USFDA) provide good background information. However, producers should be aware of the fact that EU food and drug legislation is stricter than that of the United States in some respects, and that the actual specification of European importers will vary considerably according to the quality of product required¹⁴.

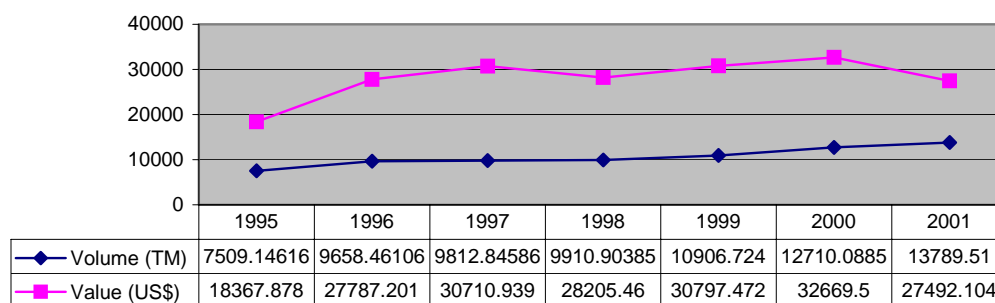
Table 2. Volume (t), Value (in US\$1 000) and average price of the beneficiada brazil nut

	1995	1996	1997	1998	1999	2000	2001
Export Volume (t)	7 509.15	9 658.46	9 812.85	9 910.90	10 906.72	12 710.09	13 789.51
Export Value	18 367.88	27 787.20	30 710.94	28 205.46	30 797.47	32 669.5	27 492.10
Price US\$/kg (US\$/lb)	0.50 (1.11)	0.59 (1.30)	0.64 (1.42)	0.59 (1.29)	0.58 (1.28)	0.53 (1.17)	0.41 (0.90)

Source: Northwestern Brazil Nut *Beneficiadores* Association (ABAN), 2003

As can be seen in Table 2, increasing volumes of exports have typically been accompanied by a reduction in the international market price. This has in turn affected the revenues of the sector, making it necessary to increase export volumes. In addition, access to international markets is becoming more and more difficult because of the increasing number of regulations that have to be honored by the exporter.

Graph 1. Volume (t) and values (in US\$1 000) for Bolivian brazil nut



Source: Northwestern Brazil Nut *Beneficiadores* Association (ABAN)

13 European Fair Trade Association (EFTA) is an association of 12 fair trade organizations in 9 European countries. It seeks to stimulate practical cooperation between its members and to develop common policies and join support to producers.

14 Edible nuts. A manual on European quality standards. Centre for the Promotion of Imports from Developing Countries (CBI) and European Fair Trade Association (EFTA).

1.9 Main applications of the brazil nut (consumption and commercialization)

For centuries brazil nut trees have been used by local people who found the nuts and pods useful. Many tribes, such as the Yanomani, eat the raw nuts, graded and mixed into manioc porridge.

Brazil nuts contain about 14 percent protein, 11 percent carbohydrates, and 67 percent fat or oil, as well as potassium, phosphorus, calcium and Vitamin B. The nuts also contain varying levels of selenium – 250 times more than most foods – depending on the soil where they have grown. Although selenium may deter ovarian cancer by helping activate a powerful antioxidant, high levels can be toxic and cause balding.¹⁵

Brazil nuts are not only consumed as a protein-rich food, but also in a special tea for stomach aches, and as an ingredient for such products as “Ben & Jerry’s Wavy Gravy” ice cream. Its oil is used for cooking, in lamps and soaps and, more recently, as an ingredient in hair conditioners. The husk can be burned for fuel, set smoking to repel mosquitoes and flies, or be carved into ashtrays and trinket cases.

1.10 National institutions and projects involved in the use of brazil nut products

There are a number of institutions involved in the production of brazil nuts in the northern region of Bolivia. These are many non-governmental and environmental institutions interested in the preservation of the Amazon tropical forest.

Some are national initiatives devoted to the preservation of the natural resources of the Bolivian Amazon region. One example is the Bolivian Council for Voluntary Forestry Certification (CFV), which outlines the “Bolivian Standards for the Forest Certification of the Brazil Nut”.

¹⁵ Enrique Ortiz. Brazil nut history revealed.

*Thus, one day it gave birth to the jungle's work, strange,
 stately, variegated, with its indecipherable symbol,
 labor of ants, shining dreams of glowworms,
 large and brutal persistence of muscles and wings.
 This monument has the proportions of a mountain.
 Its heights are rounded off by arrow-pointed cusps.
 Among them, chiselled cornices form
 symmetrical slopes.
 Bizarre figures, inconceivable faces,
 keep harmony moved solely by the air.
 Raúl Otero Reiche
 (Translator Nicomedes Suárez Araújo)*

2. CERTIFICATION OF BRAZIL NUTS

This section provides up-to-date information on existing initiatives related to brazil nut certification in the Bolivian market. All relevant certification schemes, including organic, forest management, social and product quality are taken into account. If available, comparative information on other countries is added.

Since the mid-1990s, Bolivia has developed its own processes of certification based on international (mainly European) norms. These include organic (1995, with the creation of Bolicert), product quality (2000, with the setting of Bolivian quality norms for brazil nut) and forest management (2003, if the norms are approved by FSC).

As 99 percent of Bolivian's brazil nut production is exported, Bolivia has to follow norms, regulations and certifications requested by consumer countries. The norms and regulations determined by the Asian (mainly Japanese¹⁶) market have not historically been considered as no exports to that market were identified¹⁷.

Bolivia, as a small country with very low consumption levels, depends greatly on its success in the international market for its commercial stability. If the brazil nut industry does not succeed in the international market, the industry itself as well as the families that live on the collection and processing of this crop could be threatened. It is always possible as well that these families could leave this activity and move on to forestry or the cattle industry, with devastating consequences for the tropical forest.

2.1 Organic Certification in Bolivia

Certification is a procedure for verifying that a product conforms to certain standards. In the case of organic products, certification is primarily an acknowledgement that these products have been produced according to organic production standards that may be issued by private associations, companies, certification bodies or governmental institutions.¹⁸

In 1987, the Central de Cooperativas Agrarias (El Ceibo) carried out the first biological cacao exportation, followed one year later by other products like quinoa, coffee and brazil nuts. In

16 JETRO. Marketing Guidebook for Major Imported Products. 15. Nuts and dried Fruits. Related organizations: Japan Nut Association. <http://www.jna-nut.com>

17 According to Gróver Bustillos, Bolicert General Manager, Brazil nuts enters the Japanese market through either European or American importers but never --or almost never--directly.

18 International Trade Centre (ITC). Organic food and beverages: World supply and major European Markets. 1999. www.intracen.org

1991, the Bolivian Association of Organization of Ecological Producers (AOPEB)¹⁹ was established; its goal being to guarantee the quality of ecological products through a national inspection and certification system. In addition, it also sets the standards for Bolivian organic products according to IFOAM norms. In 1995, AOPEB founded Bolicert, a company specializing in the inspection and certification of biological production that certifies according to the AOPEB norms. IFOAM acts at the international level, and AOPEB and Bolicert at the national level.

Organic certification follows the general wild collection standards and is based on the European regulation 2092/91 and the National Organic Program's (NOP) new specifications from the Department of Agriculture of the United States (USDA) that have been in force since 2002²⁰. One of the articles of the NOP regulation regarding wild collection is equivalent to the European standards and similar to the AOPEB Bolivian norm.

Although brazil nuts, both conventional and organic, were already being exported to the United States before the NOP regulations came into effect, starting in 2003, exporters must acknowledge the new standard. However, according to IMO Control Latino America and Bolicert, organic brazil nut exports to the United States should continue without problem.

According to available information, there are two processing plants that export organic brazil nuts: *El Campesino* (with 60 percent of its production certified as organic and headed to the fair-trade market) and *Tahuamanu*. According to Bolicert, in the past, the *Claure*, *Becerra* and *Bolital* processing plants produced organically certified brazil nuts, but due to a shortage in the market have discontinued their certification. Thus, from the 24 existing processing plants in Bolivia, only two certify their nuts as an organic product.

IMO Control Latino America and Bolicert certify the *El Campesino* and *Tahuamanu* organic brazil nut collection. They both interpret the 2092/91 and NOP regulations and apply them, incorporating some aspects from guides for the organic collection of *Naturland* brazil nuts and the Forest Stewardship Council (FSC) certification standards.

The authorized area for the wild collection of brazil nut includes 350 000 ha and consists of discontinuous Amazon forests separated by pastures, roads, urban centers and small agricultural areas. It is located in the Department of Pando, in the northwest region of the country²¹. As it is common in agriculture and forest management, this is an authorized area for the collection of the organic nut. The certified company is authorized to collect the crop only in this area. This does not mean, however, that the area is designated for the exclusive use of one specific *beneficiadora*. Other plants, which have not been certified as organic producers, collect the nut here in order to trade it as a conventional product.

The processing plant informs the certifying companies about the collection areas. IMO Control and Bolicert carry out the inspection and verify that the collection areas correspond to the organic standards (e.g. no contamination risks, garbage containers).

19 AOPEB is a standard setting association, integrated mainly by peasant organizations. It has been created to promote ecological farming, defend its interests, and to make sure that there are systems and organism that guarantee, in an integral form, the ecological-products quality for the international demand. www.aopeb.org

20 More detailed information on the NOP, as well as the full regulations and an application form for accreditation, are available at the USDA NOP Web site: www.ams.usda.gov/nop Further information may also be obtained from the Independent Organic Inspectors' Association. See www.ioia.net.

21 Moyano R., IMO Control Latino America.

2.2 Certification processes

The certification processes are carried out as follows²²:

- a) Certification by local bodies.
- b) Certification under partnership between local and international bodies.
- c) Certification by a local branch on an international certification body.
- d) Certification by international bodies.

2.2.1 Certification by local bodies

Two Bolivian companies carry out organic inspections and certifications: Bolicert and Bio Latina²³. Bolicert inspects and certifies organic brazil nuts.

Both companies' certification processes are based on the European Union's regulation EEC 2092/91 and NOP's regulation on ecological agriculture. These norms respond to the quality production standards that make them different from traditional and conventional agriculture in order to confirm that the Bolivian organic collector follows the referential frame from the International Federation of Organic Agriculture Movements (IFOAM)²⁴.

It is fundamental for Bolivian producers to acknowledge international standards in order to enter the European market; otherwise the importers would not accept these certificates. It is important to note that the inspected and certified brazil nut may be sold with a Bolicert seal. The use of a seal in the international market becomes highly important for the consumer, as it proves that the product has not been treated with pesticides or synthesized fertilizers.

The seal becomes thus a fundamental instrument for the international trade of ecological products. The national seals, however, are not as powerful as their international counterparts. Even if it is based upon international standards, a Bolivian seal will not have the same impact as the seal of an international agency (this shows a natural advantage for the international certifiers with respect to the national ones).

2.2.2 Certification under partnership between local and international bodies

Certification may be carried out under a partnership between local and international certification bodies. The certification can take various forms, but often the local bodies carry out the bulk of the work leading to certification while the international certification body periodically evaluates the implementation of certification procedures and issues the certificates. This can potentially reduce certification costs for the operators while providing access to an international certification mark, as well as strengthen local inspection and certification capacity.²⁵

According to new regulations, although this kind of partnership was common in the past, it is no longer possible. Now the body that carries out the inspection must extend the certificate,

22 This classification is according to the International Trade Centre. Organic Food and Beverages: World supply and major European Markets. Geneva 1999.

23 National organizations that work in the field of organic certification did associate to conform Bio Latina. Its founding members are: Biopacha (Bolivia), Bio Muisca (Columbia), Cenipae (Nicaragua) and Inka Cert (Peru). Regarding the production, processing and exportation standards of organic products, these organizations work according the Basic Rules of IFOAM for Organic Agriculture, the EEC Regulation 2092/91 "Organic Agriculture" and the US Regulation "Organic Foods Production Act".

24 The International Federation of Organic Agriculture Movements (IFOAM) was established in 1972 as an umbrella organization for national organic agriculture associations. Members also include certification bodies, traders and processors. IFOAM has established international Basic Standards of Organic Agriculture and Food Processing, which provide a framework for various certification programs.

25 International Trade Centre (ITC). Organic Food and Beverages: World supply and Major European Markets. Geneva 1999.

as in the case of the organic brazil nut that goes into the market with both IMO Control and Bolicert labels.

2.2.3 Certification by a local branch of an international certification body

IMO Control, an international certification body, has established a branch office in Bolivia and certifies the organic brazil nut collection of *Tahuamanu*, located at Cobija.

IMO Control follows the inspection and certification procedures of the mother company (located in Switzerland), which are fully integrated into its international certification system. Also Agreco, a German company, has a branch in Santa Cruz de la Sierra, Bolivia.

2.2.4 Certification by international bodies

Although highly uncommon, there have been some instances of companies that had no representation in Bolivia and only came to the country to certify a product. An example is the North American Organic Crop Improvement Association (OCIA) that came to Bolivia exclusively to certify the organic quinoa production of Anapqui. This kind of operation is possible but often too expensive for producers.

2.3 Relevance of certified compared to conventionally traded organic brazil nuts

Precise data do not exist regarding the export volume of organic versus conventional product, because the National Statistics Institute (INE) only reports the total exports without specifying whether the product is organic or conventional.

According to Ecotop, the value of certified organic brazil nut exports corresponded to 3.6 percent of total exports in 1994²⁶.

According to information provided by *Tahuamanu*, in 2001 their volume of organic brazil nuts exported had reached a maximum of 93.2 tonnes (exports initiated in 1997). It is interesting to note that brazil nut export volumes have been growing each year.

On the other hand, the data provided by the Northwestern Brazil nut *beneficiadores* Association (ABAN) states that the exports of *El Campesino* during 1999 reached 198.9 tonnes. According to Gróver Bustillos, Bolicert General Manager, approximately 60 percent (about 120 tonnes) of that amount is destined to the fair-trade market as organic nuts.

Even though the brazil nut is a product that can be collected in the wild, it cannot be used as a natural ingredient without proper certification. According to the European Norm 2092/91 only some products, such as Kola nut (*Cola acuminata*), can be used as an organic product that has not been certified²⁷. For the processing of ecological products, it only allows five percent of non-ecological products (conventional). The remaining 95 percent of the ingredients should be certified as ecological.²⁸

We can thus conclude that organic brazil nut export volumes are still very low with respect to non-certified volumes; however, there is a tendency of growing organic export volumes throughout the years.

26 Augsburg, F. 1996. Agricultura ecológica en Bolivia: ¿Una opción para la economía campesina?. Ruralter No. 15. (p. 265-279)

27 Regulation EEC No. 2092/91 of the council of June 24, 1991. Annex VI. 2.16 (regulation (EEC) No. 207/93 of the council of January 29, 1993).

28 Information provided by Ramos Santalla. N. Responsible for AOPEB's Technical Department.

2.4 Forest (products) certification

2.4.1 Forest Stewardship Council (FSC)

The principles of the Forest Stewardship Council (FSC) are among the most important international guidelines in the field of forest certification. FSC works in a similar way as IFOAM. This means that the FSC has developed a number of principles and criteria valid for forestry management. However, the FSC does not certify sustainable forestry itself.²⁹

2.4.2 The Bolivian Council for Voluntary Forestry Certification (CFV)

Following a consultation process that started at the beginning of 1998, CFV³⁰ has developed the Bolivian Standards for Brazil Nut Forestry Management Certification. The promotion of this certification is based on the principles and procedures for the development of forestry certification standards from the Forest Stewardship Council (FSC)³¹.

The certification process relies on the strategic conservation of the forests where brazil nut trees are found, because they are subject to a constant and always growing threat from deforestation, migrant agriculture and cattle raising. The development of standards constitutes a participatory process which looks forward to the compatibility between the international principles and criteria related to forestry management, and the proper conditions of the local actors involved in nut activity³².

During the process, eight drafts were written and the final version was presented to FSC for its revision and approval in August 2001. The answer was received in February 2002 specifying four conditions that were to be acknowledged within 6 to 12 months. A meeting was carried out in December 2002 and the answers to the observations, the conditions and the modifications proposed by FSC were presented for their revision and approval.

The procedures stated by FSC for the development of national standards for forestry certification demand that these standards be harmonized with those of other FSC groups working in neighbouring countries with similar ecosystems. This harmonization is done in order to identify the differences among them and gradually eliminate those divergences which are not justified by environmental and socioeconomic conditions specific to each country³³.

Currently, there are no processing plants or collection areas in Bolivia that are certified according to the FSC principles and criteria. As a result, their impact cannot yet be measured in economic terms. According to the information provided by BOLFOR, the problems are connected mainly with legal issues related to the land³⁴.

29 Eco Trade Manual. Environmental challenges for exporting to the European Union. August 1998. CBI. DIPO. NORAD. OSEC. PROTRADE. SIDA.

30 CFV is a Bolivian non-profit civil association, founded in 1995, with the mission to promote sustainable forestry management through the Voluntary Forestry Certification. CFV is associated to FSC as the Bolivian working group.

31 Established in 1993, the FSC is the international benchmark for forest certification and labeling of forest products. Forest certification is a system of forest inspection plus a means of tracking forest products through a "chain of custody", following the raw material through to the finished product. This is done in order to ensure that the products have come from forests, and that they are well managed – meaning they take into account environmental, social and economic principles and criteria.

32 Consejo Boliviano para la Certificación Forestal Voluntaria (CFV). Estándares bolivianos para la certificación forestal de la castaña (*Bertholletia excelsa*). Final Draft. Riberalta – Beni. August 2001.

33 In March 2001, the FSC recognized Peru's standard for Brazil nut harvesting as the first FSC standards for a non-wood forest product (NWFP).

34 Information provided by Melgarejo. O. Research assistant at BOLFOR during a personal communication.

2.5 Fair Trade Labels

Fair trade labels mainly focus on the labour and living conditions of the worker in developing countries. Environmental issues play a (minor) role within the scope of these labels. The idea behind fair trade is to offer products made by small producers in developing countries to consumers in developed countries. Fair trade organizations have been founded to protect small farmers from being forced to accept low prices, ensure minimum prices and create a market for their products. The most relevant fair trade labels in the context of brazil nut exportation from Bolivia are Max Havelaar and Trans Fair International.³⁵

With regard to social aspects, the only one organization that operates in Bolivia with brazil nuts is Trans Fair International. The price paid by Trans Fair International is usually higher than the world market price in order to enable farmers to attain a favourable trading position.

Despite the fact that the fair trade market may become an important instrument for Bolivian brazil nut producers, this market is still very difficult to enter as products have to be purchased directly from small-scale organizations. This means that at the moment only *El Campesino* can export through this market. The producers must be registered in the Register of Producers of fair trade organizations such as Max Havelaar and Trans Fair International.

Fair trade buyers monitor, through national (as IMO Control or individual) or international inspectors, if *El Campesino* uses the premium received from its brazil nut exports in the manner agreed upon. Criteria for the investment of the premium received include: a) economic development for the whole co-operation; b) organizational development; c) improvement of the living standard of members and their families; d) respect for nature and stimulation of environmentally sound production techniques; e) stimulation of active roles for women in the organization and; f) improvement of product quality to be used as a strategic instrument for small producers (Eco Trade Manual, 1998).

According to information provided by AOPEB, the FOB price in Arica (Chile) for organic brazil nuts is currently US\$1.3 to 1.4 per pound (US\$0.59 to 0.64 per kg) compared to US\$0.6 to 0.8 (US\$0.27 to 0.36) for conventional brazil nuts. The fair trade market is currently paying US\$1.35 per pound (US\$0.61 per kg). The final destination of these exports is the European and North American markets.

El Campesino produces both organic and fair trade certified nuts, as organic certification is sometimes also requested from fair trade buyers. Another example of multiple certification is *Tahuamanu*, which is producing brazil nuts according to fair trade and product quality (HACCP, see below) standards. The main markets for the fair trade/organic brazil nuts produced by *El Campesino* are Rapunzel³⁶ (Germany), Fair Trade (The Netherlands), CTM (Italy), Global Organics³⁷ (USA), El Puente (Germany) and Ferrara (Italy).

2.6 Quality standards for food processing

2.6.1 Codex Alimentarius (FAO)

In 1962, the joint FAO/WHO Food Standards Program was created in order to protect consumers from health hazards and deception while at the same time facilitating

35 Eco Trade Manual. Environmental challenges for exporting to the European Union. August 1998. CBI. DIPO. NORAD. OSEC. PROTRADE. SIDA.

36 Rapunzel Pure Organics, Inc. Valatie, NY. It is a subsidiary of Rapunzel in Germany and markets a broad range of retail-packed food products, imported mainly from Germany and Switzerland. However, the European HQs import raw material/ingredients from developing countries. www.rapunzel.com

37 Global Organics, Ltd., Arlington, MA. Is an importer and exporter of organic and natural ingredients (cocoa products, dried fruits and nuts, coconut oil and palm oil, spices, sugar and cane products, etc.). www.globalorganicsltd.com

international trade in food products. The programme operates through an intergovernmental body referred to as the Codex Alimentarius Commission. The work of the commission aims primarily at the prevention of the use of international standards as technical barriers to the trade in food products.

According to FAO, certification is the procedure by which official certification bodies or officially recognized certification bodies provide written or equivalent assurance that foods or food control systems conform with requirements. Certification of food can be, as appropriate, based on a range of inspection activities that may include continuous on-line inspection, auditing by qualified insurance systems and examination of finished products.³⁸ Certificates are issued by an official certification body of an exporting country, in accordance with the requirements of an importing or exporting country.³⁹

The Codex Alimentarius Commission has elaborated international codes for nut tree (including the brazil nut) sanitation that provide the basic requirements for orchards, farm processing (selling and hulling) and/or commercial shelling or in-shell operations. The regulations determined by the FAO's Codex Alimentarius have been adopted by the Bolivian Quality and Normalization Institute (IBNORCA), which acts as the official representative from Codex Alimentarius in Bolivia.

2.6.2 Bolivian quality norms (IBNORCA)

The Bolivian Quality and Normalization Institute (IBNORCA) has elaborated some norms for the different classification stages, good sanitation practices, aflatoxins sampling of brazil nut (one of them is identical to the FAO's Codex Alimentarius).

The norms are:

- **Bolivian Norm NB 1015 (May 2000):** Dehydrated fruits – Brazil nuts – Classification and requisites;
- **Bolivian Norm NB 1016 (May 2000):** Dehydrated fruits – Good Brazil nut Hygiene Practices Code;
- **Bolivian Norm NB 1017 (May 2000):** Dehydrated fruits – Brazil nuts – Sampling for the aflatoxins contains;
- **Bolivian Norm NB 1018 (May 2000):** Dehydrated fruits – Brazil nuts – Sampling preparation and general requirements that should accomplish the analysis methods for the aflatoxins control;
- **Bolivian Norm NB 1067 (November 2000):** Code for Sanitation practices for the nuts produced by trees (this norm is identical to the CODEX CAC/RCP 06-1972 Code).

Today, in Bolivia, even though it is IBNORCA's responsibility, brazil nut control is carried out by a state organization, the Agriculture and Cattle Raising Security National Service (SENASAG). In addition, laboratories are hired to undertake the required analyses (microbiologic and toxicological).

The control laboratory belongs to the Société Générale de Surveillance – SGS (verification, testing and certification company) and issues a report with the label "certificate". The buyer then assumes it is a quality label, ignoring that it is in fact only a lab report. This document also states some specifications such as large, tiny, chipped (brazil nut size classification), but they provide no analysis of this information; they simply trust the producer declaration⁴⁰.

38 Codex alimentarius. Principles for food Import and export Inspection and Certification (CAC/GL 20-1995) http://www.codexalimentarius.net/standard_list.asp

39 Codex alimentarius. Guidelines for generic official certificates formats and the production and issuance of certificates (CAC/GL 38-2001). http://www.codexalimentarius.net/standard_list.asp.

40 Villavicencio R., Ibnorca's inspector. Personal communication (2003)

IBNORCA does not have a system of certification for the brazil nut to provide the *beneficiador* with a Quality Certificate according to the norms described⁴¹.

2.6.3 ISO 9002

The ISO 9000 series are the best-known standards for quality assurance worldwide. In particular, ISO 9002 provides guidelines for the establishment of a quality system, and is recognized in more than 60 countries. The certificate of approval assigned to companies that meet the standards of ISO 9002 is an internationally recognized symbol of their high quality assurance systems.⁴²

2.6.4 Food production – HACCP

The Hazard Analysis Control Point (HACCP) system, adopted by the 20th Session of the Joint FAO/WHO Codex Alimentarius Commission in 1993, identifies specific hazards and preventive measures for their control to ensure food safety. It is a tool, fully compatible with quality assurance systems like the ISO 9000 series, to assess hazards and establish control systems that focus on preventive measurements rather than relying mainly on end product testing. The European Union adopted the system in Directive 93/43/EC on the Hygiene for Foodstuffs, which is now a statutory requirement in all member countries, and stipulates “foodstuff companies shall identify each aspect of their activities which has a bearing on the safety procedures that are established, applied, maintained and revised on the basis of the HACCP System”.

The HACCP system is applicable to all companies in the food chain, from the primary producer to the final consumer, that process, treat, pack, transport, distribute or trade foodstuffs. All EU companies are now legally bound to have a HACCP plan or system. There must be an understanding of the possible hazards associated with food production at all stages, from growth, processing, manufacturing and distribution, through the point of consumption.

Because of their role as suppliers to importers in the European food chain, it is essential that producers linked to the European Fair Trade Association (EFTA) critically examine their production processes in the same thorough way, by making an HACCP plan and/or system of operation.

Tahuamanu is now following a process of accreditation consistent with HACCP. The whole system, including documentation and quality controls, has been adapted to the requirements of this system. Even the staff is engaged in permanent training.

EUROPEAN PRODUCT SPECIFICATION FOR BRAZIL NUTS

Forms traded

Brazil nuts are traded mainly in kernel form. Good-shelled nuts are large, smooth and uniform in size with a creamy brown skin and a white inner heart.

Grading

The grading of brazil nut is based on the number of nuts per pound weight. One pound (lb) = 454 grams. The accepted range of counts for in-shell brazil nuts per pound is 35/40 (extra large), 40/45 (large), 50/55 (extra medium), 57/62 (medium) and over 70 (small). For brazil nut kernels the counts are 90/110 (large), 110/130 (medium), 140/160 (small), 160/180 (midget) 180/220 (tiny). Chipped and broken kernels are also sold.

Packaging

In-shell nuts are packed in bags of 50 lbs or 25 kgs. Shelled nuts are frequently packed in the same way as cashew nuts, in tins of 10 or 15 kg which are nitrogen-flushed before sealing. Airtight packaging is essential. Tin foil bags of 10 or 20 kg are also sometimes used.

41 http://www.ibnorca.org/certif_sello.htm and <http://www.ibnorca.org/documentos.htm>

42 CBI and EFTA. Edible Nuts. A manual on European quality standards. 1996.

Specimen product specification

Brazil nut: shelled midget

Count / sizes

160 – 180n pieces per pound (454 grams)

Quality specification

Broken nuts (<7/8 nuts) max. 4.0 percent

- inclusive of nut parts (<1/4 nut) max. 1.5 percent

Damaged nuts max. 3.0 percent

Total defects may not exceed 5.0 percent

Chemical specification

Free Fatty Acid (FFA) max. 0.5 percent

Aflatoxin⁴³ B1 max. 4.0 ppb

Aflatoxin B1, B2, G1 and G2 max. 10.0 ppb

Moisture 1.5 – 3.0 percent

Peroxide value (PO) max. 1.0 meq 0.2 kg/fat

Microbiological specification

Standard plate count max. 10 000 / g

Mold and yeasts max. 500 / g

Enterobacteriaceae max. 10 / g

E coli negative

Salmonella negative

Sensoric specification

Appearance: smooth and fresh looking shelled brazil nut

Color: cream/brown; the heart is white

Taste: characteristic fresh taste of brazil nut, not rancid or old

Texture: strong, fresh, crispy

Odor: typical

Source: CBI / EFTA (1996)

2.7 Standards and certification related to national and international laws and regulations

Most national certification norms existing in Bolivia - organic, forestry, fair-trade or quality - are based on international regulations (in some cases they are the same). This follows a logical principle, as Bolivian brazil nut exports go to international, mainly European and North American, markets. Bolivian regulations are mainly based on European norms because as they are considered stricter than the North American, the fulfilment of those norms qualifies the product for both markets.

Even though a great amount of Bolivian brazil nut exports leave the country as conventional products, they have still to acknowledge a series of specifications required by the importers, some of which will be described next. These exportations are certified by the Agriculture and Cattle Raising Security National Service (SENASAG), but those are not quality certificates. What they do in fact is a series of laboratory tests in order to particularly measure the aflatoxins level.

43 Aflatoxins are part of the mycotoxin group of chemicals and are produced by a species of the fungus *Aspergillus*. They can be present even when visible moldings are not seen and contamination occurs.

*I saw the poem in the tropic's diaphanous night.
 By starlight I read my sentiments.
 You filled my mind, dream tree,
 my machete,
 my serpent,
 my ardor,
 my young tiger heart.
 Pedro Shimose
 (Translator: Cola Franzen)*

3. COMPARATIVE ANALYSIS OF ORGANIC CERTIFIED AND NON-CERTIFIED (CONVENTIONAL) PRODUCTION AND INTERNATIONAL TRADE OF BRAZIL NUT

This section analyzes in detail the impact of certification on the sustainable use of the wild gathered brazil nut, compared to the non-certified product.

3.1 Characteristics of the organic market

The International Trade Centre (ITC)⁴⁴ estimates that organic products valued close to US\$22 billion in the three main markets of Europe, the United States, and Japan. This is still a market niche if compared with the conventional food products sector, since it represents only three percent of the retail sales. However, the World Trade Organization (WTO)⁴⁵ estimates that this percentage will represent between five and ten percent of the developed markets by 2005.

The value of organic sales in most European Union countries is growing rapidly. Germany is the largest market with estimated retail sales of more than US\$2 billion in 2000. In the same year in the United Kingdom and Italy sales were over US\$1 billion. Growth rates are high in most European Union countries, particularly in the United Kingdom (second importer of brazil nuts).⁴⁶

The retail market for organic food and beverages in United States can be estimated at about US\$8 billion in 2000, according to various industry sources. According to *The U.S. Organic Food Market* (November 2000), prepared by *Packaged Facts Report*⁴⁷, the organic market increased from US\$6.5 billion in 1999 to US\$7.8 billion in 2000 (a 20% increase), and is expected to reach US\$20 billion by 2005. According to another survey, *Organic Consumer Trends 2001* (published jointly by *The Natural Marketing Institute* and the *Organic Trade Association* in May 2000), retail sales of organic products have grown at a compounded annual growth of 22.74 percent over the past ten years and by 24.72 percent over the last three years. They projected retail sales of US\$9.3 billion in 2001 and also expect sales to reach about US\$20 billion by 2005⁴⁸.

The increased consumption of organic products by European and American consumers can be attributed to many factors. A recent survey in the United Kingdom revealed the following consumer attitudes toward organic foods: they taste better (43%); they are healthy/better for

⁴⁴ www.intracen.org

⁴⁵ www.wto.org

⁴⁶ EU Market Survey 2002. Organic Food Products. ProFound in collaboration with J. Pierrot September 2002

⁴⁷ www.marketresearch.com

⁴⁸ See table of contents and executive summary at www.nmisolutions.com

you (42%); they are free of genetic modifications (27%); they are environment/animal welfare friendly (27%)⁴⁹.

Consumers in Europe and the United States are concerned with the quality of their food. A good example is the fact that they choose organic dairy products for their babies, because the products are good for their babies' health and parents are willing to pay higher prices for better foods. This is why it is possible to foresee a continuing change in the eating habits of the European consumers towards organic, healthier products.

Even though organic products have higher prices than conventional products, there is a tendency to shorten the difference by five to ten percent in the long term. This is due to growing supply, better production and logistics, and growing market competition. Another important factor is the increasingly aggressive and targeted marketing and promotion by the retail sector, which is likely to intensify, as mainstream retailers are moving into the organic trade. A similar effect is likely to result from the fact that the major food manufacturers are also taking an increasing interest in developing organic product lines⁵⁰.

Another aspect, which is worth considering, is that every country is regulating and promoting laws that protect environment and biodiversity. The observation of those laws is imperative, mainly for products coming from forests and protected areas. FSC norms, ecological tourism, origin and other norms are an example of what is known as biotrade and supported by the "Bolivia Biotrade Country Programme Phase I" project of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), United Nations Conference on Trade and Development (UNCTAD) and State Secretariat for Economic affairs (SECO)⁵¹.

3.2 Organic versus conventional brazil nuts

Both, organic and conventional brazil nuts are collected in the same area. Among the one million hectares that are authorized for nut collection, 350 000 ha are designated for gathering organic nuts. This smaller area is also authorized, however, for the collection of conventional nut. That means that some 35 percent of the total collection area can be used for the collection of organic nuts, but this area contributes to only 2.2 percent of the total value and 1.5 percent of the total volume of brazil nuts exported from Bolivia. A large area has been authorized, but only small quantities are exported because of lack of demand in certified products (in recent years, three companies have stopped exporting organics).

Tahuamanu and *El Campesino* are the only Bolivian companies that have certified organic brazil nuts. They share the same harvesters, warehouses, contractors, and processing plants in order to carry out the process of exporting both conventional and organic brazil nuts. They do not share, however, the same certifying companies, prices, markets, or importing companies.

The organic brazil nut has had a positive impact on the economy of local harvesters and processing plants in the northern region of Bolivia. The export rate has reached a maximum of 213 MT throughout 2001⁵² (*Tahuamanu* started its organic nut exports in 1997).

49 Source: MORI, 2001

50 Kortbech-Olesen, Rudy. March 2002. The United States market for organic food and beverages. www.intracen.org/mds/sectors/organic/

51 Ministerio de Desarrollo Sostenible y Planificación, Viceministerio de Medio Ambiente Recursos Naturales y Desarrollo Forestal, Dirección General de Biodiversidad 2002. Diagnóstico sobre el Biocomercio en Bolivia y Recomendaciones para la puesta en marcha del Programa Nacional de Biocomercio Sostenible. La Paz, Bolivia.

52 Not all the Brazil nut certified as organic gets exported. Actually, in some occasions, organic nuts are exported as conventional.

In 2001, *Tahuamanu* was responsible for the 93.2 tonnes and 120 tonnes that were exported by *El Campesino* Cooperative. The latter directed most of its exports to the fair trade through the Trade Fair Cooperative Ferrara in Italy.

Using 2001 as an example, when a total of 13 334 tonnes were exported, the organic brazil nut exports represent the 1.6 percent from the total of exported product, having the organic certification the greater impact on the economy of the region.

Thus the comparative analysis focuses on measuring the economic effects of the process of organic certification, taking into account the volumes of exportation, values and prices obtained. This is why a special emphasis is given to the experience of IMO Control Latino America and Bolicert, as they certify both brazil nut processing plants and the total exports of organic brazil nuts.

On the other hand, the other certificates will play a fundamental role in the economy of the brazil nut, especially forest management certification. However, this one has not still been granted to any company, so it is impossible at the moment to talk about the brazil nut which has been certified according to forest management standards. This is mainly due to problems with land tenure.

Land tenure is a complex problem mainly in the areas where brazil nuts are collected because the government aims, through the Supreme Decree No. 25532 (called *barraquero decree*), to consolidate 3.5 million hectares in favour of 240 *barraqueros*. Inside that area, however, were 500 farmer communities, including some territories that belong to the indigenous territories (TCO's).

The Supreme Decree had its own legal problems as, according to the Forestry Law, a process of public auction should be opened in order to deliver forestry concessions. This did not happen. As a consequence, the Decree was abrogated in July 2002, leaving the solution of the problem of the land tenure unresolved.

The SENASAG/IBNORCA issues a certificate for exported brazil nuts. These norms are also applied to all Bolivian exports, including the organic brazil nut; yet, under no circumstance is this certification to be considered as a quality seal. It is only a certificate for all the brazil nuts that leave Bolivia, whether organic or conventional.

3.3 Prices

Tahuamanu and El Campesino export organic brazil nuts with a premium in the price with respect to the non-certified (the organic importer may accept price premiums of a maximum of up to 15-35 percent; if higher he/she is usually more reluctant to buy⁵³). The brazil nut exporters may also typically expect a premium of 15-35 percent, though in some cases the premium may be higher (or lower).

As prices for most organic products tend to fluctuate over time and market requirements change frequently, suppliers need to monitor the market and price movements closely to arrive at a realistic pricing policy. However, the usual demand/supply mechanism will tend to force prices down over time. It is important that brazil nut exporters do not overestimate the price premiums that may be obtained, and that they base their export prices on realistic production costs and price expectations.

53 Kortbech-Olesen, Rudy. March 2002. The United States market for organic food and beverages. www.intracen.org/mds/sectors/organic/

According to information provided by ABAN and AOPEB, between 1995 and 2001, the average price for conventional and organic brazil nut experienced a downward trend starting in 1997. This can be seen in the following chart; the premium or price differential among the organic and conventional nuts fluctuates around US\$0.16 per kilogram.⁵⁴

Table 3. FOB price for brazil nuts (US\$/kg) 1995 - 2001

Price	1995	1996	1997	1998	1999	2000	2001
Organic							
- US\$/kg	0.66	0.74	0.80	0.70	0.70	0.68	0.52
- (US\$/lb)	(1.45)	(1.64)	(1.76)	(1.55)	(1.55)	(1.50)	(1.15)
Conventional							
- US\$/kg	0.50	0.59	0.64	0.54	0.54	0.52	0.38
- (US\$/lb)	(1.10)	(1.29)	(1.41)	(1.20)	(1.20)	(1.15)	(0.84)
Differential (premium)							
- US\$/kg	0.16	0.15	0.16	0.16	0.16	0.16	0.14
- (US\$/lb)	(0.35)	(0.35)	(0.35)	(0.35)	(0.35)	(0.35)	(0.31)
Fair Trade							
- US\$/kg	N/A	N/A	N/A	N/A	N/A	N/A	0.58
- (US\$/lb)							(1.27)

Source: N.R. Santalla, Bolivian Association of Organization of Ecological Producers (AOPEB), pers. comm., 2003; O. Chevez, Northwestern Brazil Nuts Beneficiadores Association (ABAN), pers. comm., 2003)

Because there is limited information available about organic brazil nuts, the information gathered is mainly based on primary sources. This has entailed talking directly to brazil nut exporters, companies in charge of the certification process (IOM Control and Bolicert) as well as representatives of AOPEB and ABAN. A good amount of information was gathered through this process, but in the cases with no access to precise facts, some figures are considered as estimates.

In the case of Tahuamanu, which represents a part of the commercialized volume of organic brazil nut, the "price differential corresponds to US\$0.15 per pound (US\$0.07 per kg), over the international price", according to the information provided by its Executive President, Mr Enrique Nelkenbaum, which corresponds to 43 percent of the premium presented in Table 3.

3.4 Monetary and non-monetary benefits provided by the organic certification process

We will consider the brazil nut sustainability from two perspectives: the economic incomes generated by the organic and conventional nut exports (monetary benefits), and the ecological, understood as the preservation of forests, rivers, ecosystems, and biodiversity (non-monetary benefits).

3.5 Monetary benefits

Using available information⁵⁵, the approximate value of both conventional and organic brazil nut exportations has been estimated. For that purpose, average prices, according to the

⁵⁴ This price differential changes every year, between Tahuamanu and El Campesino, from market to market, from buyer to buyer; so the prices are averages.

⁵⁵ In Bolivia, although there was support of some companies and organizations for the writing of this report, it is very hard to find information. Some of the certifying companies state that the information related to the Brazil nut is confidential, according to the ISO 65 norm.

information provided by FAOSTAT, ABAN (conventional), AOPEB (organic), IMO Control and Tahuamanu, have been used

The income generated by organic brazil nut exports show a positive trend: starting at US\$383 600 in 1995, they reached US\$540 520 by 2001. Likewise, the exported volumes have been increasing continuously, while the prices have been lowering, diminishing the values.

During the last few years, the total brazil nut export volume has been increasing together with the volume of organic exports. The correlation between the total and the organic exports is 0.55, using the correlation coefficient (which determines the relation among both properties). The results show a high correlation.

Table 4. Volume (t), value (in US\$ 1 000) and average price for the processed brazil nut

	1995	1996	1997	1998	1999	2000	2001
Conventional volume (t)	7 389.00	9 539.00	9 698.00	9 783.00	11 221.00	13 603.50	13 120.80
Organic volume (t)	120.00	120.00	136.00	167.00	185.00	201.50	213.20
Total Volume (t)	7 509.00	9 659.00	9 834.00	9 950.00	11 406.00	13 805.00	13 334.00
% of organic volume of total volume	1.6	1.2	1.4	1.7	1.6	1.5	1.6
Conventional value (US\$1 000)	17 918.77	27 128.29	30 146.10	25 881.12	29 685.38	34 488.82	24 297.94
Organic value (US\$1 000)	383.60	433.87	527.69	570.66	632.17	666.34	540.52
Total Value (US\$)	18 368.00	27 787.00	30 711.00	28 257.00	30 889.00	33 803.00	26 561.00
% of organic value of total value	2.1	1.6	1.7	2	2	2	2

Source: Based on FAOSTAT (2003) and interviews with representatives of ABAN, AOPEB, IMO Control Latino America, Tahuamanu and ECOTOP (2003)

The drop of the brazil nut's prices (conventional and organic) and the increase of exported volumes shows an elastic price-demand for brazil nut: the lower the nut's prices, the bigger the commercialized volumes both for the organic and the conventional products.

It is certain that the organic sector is very important; however, the conventional brazil nut market still plays a fundamental role, with its own norms and regulations like the aflatoxins level, rancidity and size; all related with prices, volumes, harvest year, delivery time, payment conditions, etc.

As long as the processing plants fulfil the importers' requirements, it will be possible to increase the exported volumes. Nevertheless, due to the agricultural products' natural tendency to lower their prices, the processing plants will be forced to be more efficient in brazil nut collection and processing stages. In the years to come, this will provoke a drop of the conventional brazil nut's prices, which will drag down the prices of the organic products. In the near future the importers will pay the same price for an organic brazil nut that today they pay for a conventional one (more conditions, more regulations, lower price).

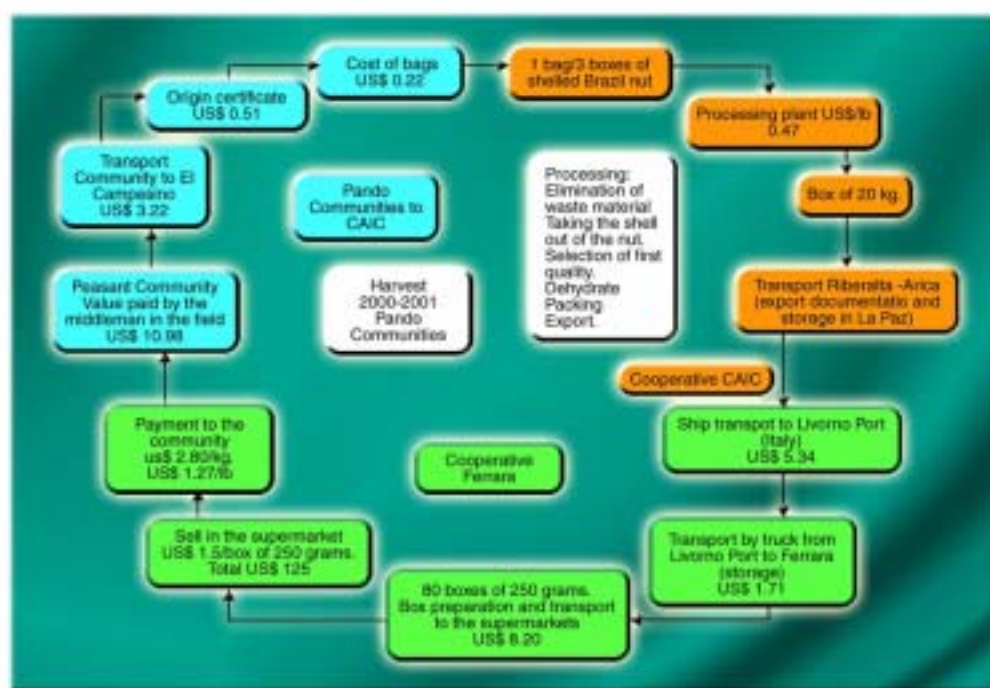
It is possible to see that, starting in 1998, the organic brazil nut's exported values, with respect to the conventional one, have maintained their relative participation at one to four percent of the generated values.

The drop in brazil nut exporting prices has affected the farmers who collect the product and who have received lower prices; as a result, they have looked for commercial alternatives like the Italian fair trade market.

According to the General Secretary for the Federación Sindical Única de Trabajadores Campesino de Pando (FSUTCP), Rolando Quispe, farmers who export their products through the fair trade market have been able to extend their profits up to 2.5 times, in 2001, and 4.4 in 2002. The experience took place in five rural communities during 2001 and ten communities throughout 2002. Farmers sent their collected nuts to the Alternative Trade Cooperative Ferrara, in Italy, where the product was divided into 250-gram boxes for sale in supermarkets⁵⁶.

Ten months after the exportation, they were able to generate more net profit: US\$29.86 per 69-kilogram bags or *barrica* (which results in approximately one first-quality 20 kilogram brazil nut box for export), in comparison to the US\$10.98 that they used to get for the same amount⁵⁷.

Chart 2. Example of brazil nut export chain from El Campesino (Bolivia) to Ferrara (Italy)



Example of brazil nut export chain from El Campesino (Bolivia) to Ferrara (Italy)

Source: FSUTCP - CEJIS - FOBOMADE - CIOEC. La economía de la castaña. Desde las barracas hasta el comercio mundial. November 2002

Made by: Marcelo Paz Soldán

56 FSUTCP – CEJIS – FOBOMADE – CIOEC. La economía de la castaña. Desde las barracas hasta el mercado mundial. November 2002.

57 The average exchange rate during 2001 was 1 US\$ = 6.83 Bolivians.

3.6 Non-monetary benefits

The main non-monetary benefit obtained through organic brazil nut exportation is its contribution to the ecological preservation of the tropical forest of the Amazon region of Bolivia. While brazil nuts are a wild gathered product, its certification as an organic product is justified, as it implies that to obtain the certification, the processing plants are required to fulfil a series of norms and regulations in order to guarantee a good use of the environment: good residue management, surrounding rivers and wild vegetation.

In Brazil, pasture grounds are burnt surrounding the brazil nut tree in order to clearly see where nuts fall during the harvest period. This is not allowed in ecological agriculture. Nelkenbaum affirms that he “desire[s] everybody to understand that the brazil nut is the only fruit which allows sustainability and prevents the evident deforestation happening in Brazil. Besides, it is worth clarifying that wherever the land has been transformed in cattle ground, the brazil nut trees stop producing their fruit.”⁵⁸

Products certified as ecological increase in value due to their contribution to the care of the environment; this is a premium paid by consumers for healthy and environmental friendly products. On the other hand, this production system contributes to the prevention of the costs generated as a result of pollution and the loss of biodiversity. Some economists have even proposed to use indicators such as Environmental Rate of Return (ERR)⁵⁹, as a component of impact assessments in order to know the monetary environmental costs or benefits.

Inside this ecological production system, the stakeholders, processors and certification holders are, in economic terms, the direct beneficiaries while consumers, the environment and biodiversity constitute the indirect beneficiaries. This is due to the fact that the whole production system contributes and constitutes the fundamental base for the implementation of sustainable development and why all countries are intending to promote more sustainable production systems.

According to Walter et al. (2003), many other non-monetary benefits exist, and can be found in the Bolivian brazil nut industry, such as:

- Contribution to the local economy, e.g. livelihood improvement such as infrastructure and food security;
- Community empowerment⁶⁰ through improvement of negotiation capacity;
- Increased capacity of local populations in the sustainable use of natural/genetic resources;
- Exchange of staff and training;
- Capacity building and transfer of technology;
- Sharing of research results.

3.7 The necessary funds to cover the costs for certification

While Tahuamanu pays for their own certification processes, the El Campesino Cooperative collaborates with Dutch cooperation services, SNV, for support. Currently, the El Campesino

58 Personal communication. March 27. 2003.

59 The Environmental Rate of Return (ERR) is a concept similar to the Internal Revenue Rate (IRR) that some economists propose for evaluating the environmental feasibility of the projects in order to quantify them monetary, the positive or negative impact of the projects over the environment.

60 As general definition, empowerment is a multidimensional social process that helps people gain control over their own lives. It is a process that fosters power (that is, the capacity to implement) in people, for use in their own lives, their communities, and in their society, but acting on issues that they define as important (Page & Czuba, 1999).

Cooperative funds come from the brazil nut trade and sometimes from a percentage provided by the cooperation⁶¹.

3.8 Similarities and differences related to brazil nuts

The main difference between conventional and ecological processes is that the organic brazil nut exporters must elaborate a *Collection and Processing Plan* that guarantees, at any time, the ecological quality of the product – especially in regard to the environment and biodiversity protection in the influence area⁶².

3.9 Resource management and collection

A *Collection and Processing Plan* is developed for the brazil nut and needs to be approved by the certifying agencies. It is improved every year in order to convert the whole production unit as integrally ecological, taking into account all the surroundings.

In the organic certification of the brazil nut a flow control should be established which starts at the origin of the product, goes through the collector, the collection area and volumes. This is what the certification agencies call 'traceability' (certification provides opportunities to trace products from the source to the consumer by a functioning monitoring system). Organic certification secures that the brazil nut that is being sold is, in effect, organic, and the buyer can verify this fact. This means that if the organic brazil nut consumer, in Europe, wants to know who has produced the organic product which is being consumed, he/she should be able to identify the producer in the country of origin. Although production can be traced by importers, it has not occurred in the field of organic brazil nut that an importer has asked the certifying company to provide for the name of collectors. This has occurred once with regard to organic Bolivian coffee. Thus traceability and monitoring of sourcing and trade are indeed among the crucial prerequisites for certification.

With regard to the certification of organic brazil nuts, it is the producers themselves, together with the certifying agency, who elaborate the specific organic collection and processing norms and regulations. This process consists of the following steps:

- 1) The processing plants (*beneficiadora*) ask for a certification from the certifying agency (normally the certifying agencies has the specific norm for the product);
- 2) The certifying agency certifies according to IFOAM norms which are typically general and sometimes specific to the product to be certified;
- 3) As there is no norm for brazil nuts the certifying company and the processing plant write a norm accordingly to the area of production and to the IFOAM norms;
- 4) Once the specific norm is written for brazil nuts, it is accepted by IFOAM.

3.10 Processing

A quality processing plan should be established so that it can be proven, physically and through documentation, that the organic products and raw materials are not mixed with non-ecological ones. There should also be a documented traceability control on the processing lots, in order to guarantee ecological quality as organic and conventional brazil nuts are processed in the same plants.

61 Ramos S., N. AOPEB's Technical Department Manager.

62 Ramos S., N. AOPEB's Technical Department Manager.

3.11 The institutional organization of the stakeholders involved

Ecological production is characterized by the fact that all stakeholders must possess solid structures by means of an internal control system which indorses the fulfilment of the organic production regulations, through physical and documentary inspections which allow for the organic certification, issued by a certifying agency (IMO Control or Bolicert).

The work of the certifying agencies is constantly evaluated by the accreditation bodies representing each market (European Union and the United States). Without this accreditation, certification is not valid for the ecological products to enter the markets as such. It is controlled and evaluated for each exportation lot by each country's government authorities who finally authorize, or not, their commercialization as ecological products.

This whole regulation and control system is determined by specific by-laws that include restraining measures for fraud or non fulfilment-of-the-rules cases.

*Come, see with me the river and its laws.
Come, learn the arts of swirling froth,
come, listen to the nighttime hymns
in the magic silence of the floodplains,
all shrouded overhead in emerald stars.
Thiago de Mello*

4. CONCLUSIONS

This section analyses the overall impact of organic certification on the sustainable use of the brazil nut as well as its relevance and applicability.

Values and volumes of organically certified and exported brazil nuts are still low. Export values reached on average 2.2 percent of total exports between 1993 and 2001, and volumes reached on average 1.5 percent destined to the fair trade market of the total between 1995 and 2001.

The price paid for organic brazil nuts is usually higher than world market prices for non-organic nuts. The free on board (FOB) prices for certified brazil nuts are 15-35 percent higher than those paid for non-certified products. In the case of one Bolivian exporter, a farmers' cooperative, the extra money received is shared among all members.

The income generated by organic brazil nut exports have shown a positive trend: starting at approximately US\$383 600 in 1995, they reached US\$540 520 by 2001. Likewise, exported volumes have been increasing continuously, while the prices have been decreasing, diminishing the values.

The conditions to access international markets are becoming more and more difficult because of the growing amount of mandatory and voluntary regulations that have to be followed by Bolivian brazil nut exporters. Bolivian regulations are based mainly on European standards, which are considered stricter than their North American counterparts. Even though a large amount of Bolivian brazil nuts leave the country as conventional (uncertified), they still have to meet a series of specifications required by importers.

The certified brazil nut trade is still marginal compared to non-certified products. The major challenges of organic certification include i) lack of market demand; ii) decrease of export prices, iii) increased numbers of regulations and conditions of international importers.

During the last few years, total brazil nut export volumes have been increasing together with the volumes of organic exports. The correlation between the non-certified and certified is high, showing that they are highly integrated.

The success of the *Bolivian Standards for Brazil Nut Forest Management Certification* by CFV will depend on clarifying the legal issues related to land tenure. The fair trade market will continue growing with El Campesino as the main supplier of brazil nuts produced according to fair trade standards.

4.1 Future trends in brazil nut certification

Since 1980, a general trend of increasing brazil nut exports has been observed. This increase was accompanied by a reduction of international market prices, which has affected

the revenues of the sector, making it necessary to increase export volumes. Nevertheless, due to the natural tendency of agricultural products' to lower their prices, the *zafreiros* and *beneficiadoras* will be forced to be more efficient in the brazil nut collection and processing stages. In the years to come, this will bring about a drop of the conventional brazil nut's prices, which will drag down the prices of the organic products. In the near future, importers will pay the same price for an organic brazil nut that today they pay for a conventional one (more conditions, more regulations, lower price).

Brazil nuts are already derived from an environmentally friendly production system without any inorganic inputs but certification allows for the preservation of the environment because processing plants that are certified according to an organic norm have to follow a managerial plan for the environment. The main obstacles for brazil nut certification in Bolivia are the limited international demand for certified products and the country's unclear land tenure situation.

The organic certification of the brazil nut signifies to the consumers that neither chemicals nor fertilizers have been used for its production; it also shows that the producers are collecting the brazil nut in authorized areas, thus contributing to the ecological preservation of the tropical forest of the Amazon region of Bolivia. While the brazil nut is a wild gathered product, its certification as an organic product is justified, since it implies that to obtain the certification, the processing plants are required to fulfil a series of norms and regulations in order to guarantee a good use of the environment: good residue management, surrounding rivers and wild vegetation.

Organic certification is also a marketing tool that promotes the increase of brazil nut exports. The seal becomes thus a fundamental instrument for the international trade of ecological products. The national seals, however, are not as powerful as the international ones. Even if it is based upon international standards, a Bolivian seal will not have the same impact as the seal of an international agency (this shows a natural advantage for the international certifiers with respect to the national ones).

The certified brazil nut which then is sold by local producers, without middlemen, may grant more financial benefits to local producers, which in turn explains the trend towards more sales of organic products through cooperative producers such as El Campesino.

Organic brazil nuts reach consumers with an interest in the environment, so it is very important to research how these consumers learned about the organic brazil nut; the information obtained may help to better market the product. Regarding consumers' interest in fair trade products, it should be noted that in this case consumers are more interested in small producers' improving their living conditions than in the environment itself.

Some critical factors that need to be solved are: the land tenure problem; better working conditions; better stakeholders participation; improvement in the technological capacity of the *beneficiadoras* while at the same time protecting the environment; improvement in the management practices of the organizations involved; better productivity and a more equitable distribution of the revenues generated by the brazil nut exporters.

Table 5. Summary of key issues related to the organic certification of brazil's nut

SELECTED KEY ISSUES AND QUESTIONS	LESSONS LEARNED FROM THE BRAZIL NUT CASE STUDIES
	BOLIVIA ORGANIC CERTIFICATION OF BRAZIL NUTS
Traceability: Does certification provide opportunities to trace products from the source to the consumer by a functioning monitoring system?	YES In the organic certification of the brazil nut a flow control should be established which starts at the origin of the product, goes through the collector, the collection area and volumes. The organic certification secures the fact that the brazil nut that is being sold is, in effect, organic, and the buyer can verify this. Thus traceability and monitoring of sourcing and trade are indeed among the crucial prerequisites for certification.
Tenure rights: Does certification contribute to the clarification of tenure rights?	NO Forestry certification according to FSC standards is still not working in Bolivia because of land tenure problems. If the land tenure problem is solved, forest certification can become an excellent tool for promoting brazil nut markets. Organic, social and quality certificates do not demand a land tenure solution before they certify. It is not a requisite.
Empowerment: Does the certification process empower normally disadvantaged stakeholders?	YES Community empowerment is strengthened through improvement of the capacity for negotiation.
Rural Livelihood: Does the certification process improve livelihoods and / or reduce poverty?	YES An example is one of the Bolivian organic exporters, a farmer's cooperative. All the extra money received for the organic brazil nuts exported is shared among all members in equal parts.
Market potential: Do markets exist for organic brazil nut with a higher premium price?	YES Tahuamanu and El Campesino export with a higher premium price, and there is a market for that. There could be a market for other producers, but right now lack of demand makes it very complicated for them to enter into the market.
Costs: Are high costs related to the certification process the main reason for the reluctance of stakeholders concerned?	NO Costs do not constitute a major issue for producers/exporters. The problem is, in fact, the low demand for certified products, which favours the importer's interest in non-certified conventional products. The costs for organic certification in Bolivia are not very high.
Harvesting: Does certification promote sound exploitation and harvesting techniques?	YES The main non-monetary benefit obtained through the organic brazil nut exportation is its contribution to the ecological preservation of the tropical forest of the Amazon region of Bolivia. While the brazil nut is a wild gathering product, its certification as an organic product is justified, since it implies that to obtain the certification, the processing plants are required to fulfill a series of norms and regulations in order to guarantee a good use of the environment: good residue management, surrounding rivers and wild vegetation.
Mainstreaming: Does certification have a positive impact on the production and trade in non-certified products?	YES The volumes of exportation of organic products will directly affect the trade of the non-certified ones through i) increased market access; ii) higher prices and iii) empowerment of normally disadvantaged stakeholders.

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