



The Role of Certification Programs in the Development of Sustainable Brazil Nut Harvesting in the Madre de Dios region of Peru

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Abstract

Brazil nut harvesting in the Madre de Dios region, Southeastern Peru, is an encouraging prospect not only for local communities, but also for the future of the Amazonian Forest.

In recent years there has been a growing issue around low trade prices for Brazil nuts, which has resulted in increased levels of illegal logging and gold mining, for a more profitable trade. To help combat this, certification programs have been introduced to reduce the exploitation of harvesters by providing them with socioeconomic benefits, which also has a positive impact on the environment by protecting the forests. Here we show, through the combination of socioeconomic analysis combined with a case study company, Candela, that the use of certification programs is advancing the sustainability of Brazil nut harvesting. We use Elinor Ostrom's 'Theory of Collective Action' and her eight design principles to assess the sustainability of the company Candela, and the certification programs it uses. Specifically, we look at the Fairtrade and Organic certification programs. For the company Candela, we show that many of Ostrom's design principles are fulfilled, but in some of the design principles, there is a lack of depth. Our results demonstrate that the certification programs Fairtrade and Organic used by Candela are providing a move towards sustainability in terms of rules and regulations, but the actual monitoring and sanctioning of violations is less well-implemented, providing a definite area for future expansion in order to achieve a fully sustainable model.

Introduction

Brazil nuts (*Bertholletia excelsa*) are native to the Madre de Dios region of Peru. In this region, the 'Brazil Nut Corridor' has over one million hectares of mature rainforest, from which Brazil nuts can be viably extracted for economic profit through global trade (ASA, 2021). Local communities rely on the income generated by the harvesting and sale of Brazil nuts to sustain their livelihoods.

Importantly, Brazil nut harvesting is a model of sustainable management, where not only the local communities benefit financially, but also the surrounding forests, as the

concession system protects the forest from deforestation and enables conservation through the licensed harvesting of the Brazil nuts.

However, due to the relatively complex economic system that operates between the local Brazil nut harvesters, the private companies, and the Peruvian government, the question of sustainability arises. Achieving the economic, social, and environmental balances of harvesting Brazil nuts has been addressed in more recent years by the advent of certification programs. These certification schemes have been developed to address 'degradation, social

injustice, and consumer health' (Duchelle, Kainer & Wadt, 2014). These ethical certifications include Fairtrade and Organic programs, which this paper will focus on.

One company in particular in the Madre de Dios region has made a concerted effort to promote the sustainable development of Brazil nut harvesting, the company Candela. This paper will analyze Candela as a case study and evaluate the efficacy of its use of certification programs to promote sustainable development of Brazil nut harvesting.

Moreover, in order to assess the 'sustainability' of Brazil nut harvesting, the term 'sustainable' must first be addressed, and defined. The concept of 'sustainability' has gained much momentum in recent years, following the advent of the 'Brundtland report', published in 1987 by the UN (Chang, Zuo, Zhao, Zillante, Gan & Soebarto, 2017). However, schools of thought around the idea of 'sustainability' have existed for centuries, often termed 'social responsibility', or more recently 'corporate social responsibility' (Carroll, 1999). The Brundtland report framed 'sustainability' as "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). However, since the report's publication, there have been some three hundred alternative definitions of sustainability which have emerged (Johnston, Everard, Santillo, Karl-Henrik, 2007). Despite this, it has been widely recognized that 'sustainability' requires a balance between the carrying capacity of the ecosystem, and the human economic and social systems (Chang, Zuo, Zhao, Zillante, Gan & Soebarto, 2017). These three dimensions of sustainability have been dubbed the 'Triple

Bottom Line' (Elkington, 1997). In this essay, the definition of sustainability that will be used is the Brundtland report definition, with the 'development that meets the needs of the present without compromising the future needs' addressing the balance of the ecosystem needs, and the economic and social needs.

In order to assess the 'sustainability' of development, there have been numerous theories put forward. Socioecological theorist Elinor Ostrom proposed a particularly persuasive means of assessing the 'sustainability' of harvesting a common resource, such as Brazil nuts. Her eight design principles, laid out in her nominal work 'Governing the Commons' (Ostrom 2015) are crucial in understanding how companies such as Candela can use certification programs to develop as sustainable leaders.

Her theory of 'Collective Action' provides a solution to the 'common resource' problem of sustainability, by which a resource (such as the Brazil nut) is depleted by individual actors for their own self-interests' contrary to the common good of all users (Ostrom, 2015). This 'common resource problem' was popularised by socioeconomic theorist Garrett Hardin, in his work 'Tragedy of the Commons' in 1968 (Hardin, 1968). Ostrom's 'Theory of Collective Action' proposes an eight-step framework which interacts with the idea of a common resource and provides solutions for sustainable development via her design principles. The Brazil nuts, and the forests they grow in, are a common resource, hence why Ostrom's framework for assessing sustainability is applicable and useful. This paper will adapt her eight-step assessment framework for sustainable development in order to assess the

potential sustainability of certification programs, specifically within the company Candela.

Methods

In order to analyze the sustainability of certification programs used by the company Candela in the harvesting of Brazil nuts, the eight design principles of Ostrom's 'Collective Action' framework are useful. They are:

- 1) The common resource must have clearly defined boundaries
- 2) The common resource must have rules which govern its use, and these should fit local needs
- 3) Multiple users of the resource should participate in making decisions about the common resource's usage
- 4) The usage of the common resource must be monitored
- 5) There should be graduated sanctions for violators of the defined rules
- 6) Conflicts should be resolved easily and informally
- 7) Higher-level authorities should recognize the established rules of the resource users
- 8) Common resource management should consider different levels, from local to regional etc.

This research paper used qualitative analysis of the certification programs used by Candela, in line with the framework provided by Ostrom. This required reviewing multiple sources and research papers, as well as gathering data and information from online sources.

Ostrom's Collective Action Principles

1) The common resource must have clearly defined boundaries

The harvesting of Brazil nuts (*Bertholletia excelsa*) in the Madre de Dios region of Peru is part of a relatively complex economic system. In 1975, the Peruvian government introduced the Forestry Law No. 21147, which provided harvesting permits, but without any view to sustainable development (Willem, Ingram, Guariguata, 2019). This granted the government property rights over land and forest areas in Peru, and thus resulting in a requirement that harvesters of Brazil nuts must obtain permission, or a 'concession' in order to harvest them

(Guariguata, Cronkleton, Duchelle et al., 2017). In 2000, the Peruvian government introduced the Forestry Law No. 27308, with a view of sustainable development. The majority of harvesters obtained their concessions to harvest Brazil nuts from pre-existing contracts from 1975.

In the Madre de Dios region, there are over one thousand government-sanctioned harvesters, or *casteñeros* (Collinson, Burnett & Agreda, 2000). In the Madre de Dios region, Brazil nut concessions are granted by the National Natural Protected Areas Service (SERNANP) in protected areas, and by Peru's Regional Directorate of Forestry and Wildlife (DRFFS) everywhere else. In 2017, a study recorded that DRFFS had 1123 Brazil nut concessions, and SERNANP had 85 (Willem, Ingram, Guariguata, 2019).

The majority of harvesters sell their Brazil nuts to companies or to middlemen. This means that the harvesters themselves cannot obtain certification, such as Fairtrade or Organic; instead, they rely on the sale of their

harvested nuts to companies such as Candela, who in turn provide premiums and benefits to their harvesters. The companies, such as Candela, obtain certification by meeting the requirements of the programs.

As Brazil nuts are harvested from native forests without chemical inputs, organic certification requires a clean and dry product, free from ‘carcinogenic aflatoxins’ naturally produced by the fungus *Aspergillus* (Duchelle, Kainer & Wadt, 2014). This impacts on the collection, transport, and processing methods used by the harvesters associated with Candela. The Fairtrade Labelling Organization (FLO) has set Fairtrade standards since 1997, which emphasize price premiums, safe working conditions, strong social organization, and more direct producer–market links (Duchelle, Kainer & Wadt, 2014). Specific to Brazil nuts, they require that producers are organized into cooperatives, such as Candela.

2) Rules governing the use of common resources should fit local needs and conditions

While the concession program provided by the Peruvian government is a nationwide framework, the focus of this paper is on the role of certification programs in promoting sustainable Brazil nut harvesting in companies such as Candela. Therefore, this paper will analyze the rules laid out by certification programs which are used by Candela. However, it must be noted that the Peruvian government banned the ‘felling or burning’ of Brazil nut trees, in 1981 (Guariguata, Cronkleton, Duchelle et al., 2017). This further serves to increase the sustainability of the Brazil nut harvesting.

In the Madre de Dios region, it is estimated that 38% of the population (about

27,000) are dependent on the Brazil nut trade (Collinson, Burnett & Agreda, 2000). However, there is a problem with debt in the region, as well as poverty, as income is reliant on the sale of Brazil nuts. Many harvesters have a long history with debt, as the Brazil nut export system works by companies providing a loan to the harvesters, in exchange for a promise of future supply of Brazil nuts (Collinson, Burnett & Agreda, 2000). Candela is working to reduce this debt cycle, and provide benefits to local communities, through their certification programs and credit terms offered to harvesters.

Candela offers harvesters credit at a much more favorable rate than the alternative credit provider CREDISMAS, or the other export companies in the region. This is evidenced by the lack of interest charged on loans, there is no cumulative increase in debt daily, they don’t require the debt to be repaid in unshelled Brazil nuts, and the price is not fixed, but depends on the market price at the time (Collinson, Burnett & Agreda, 2000). This means that Candela is reducing the levels of debt in the Madre de Dios region, meeting a local need.

The use of Fairtrade and Organic certification of their products means that Candela is providing further benefits to the local communities they work with. Table 1 shows the quantitative benefits of exporting Organic and Fairtrade Brazil nuts. The Fairtrade premium on one pound of processed Brazil nuts is 0.35USD, bringing the minimum price to 3.1-3.2USD; if the product is also organic, this raises the minimum price to 3.3-3.4USD (Fairtrade International, 2016).

Some of the qualitative benefits of certification include the training provided for harvesters on reforestation techniques,

Table 1. Global Trade Prices of certified versus noncertified Brazil nuts (Extracted from fairtrade.net)

Product	Quality	Form	Region	Price Level	Quantity/Unit	Currency	Minimum Price	Fairtrade Premium	Date of Validity
Brazil Nut	Conventional	Processed; outer pod and individual shells removed	Worldwide	EXW	1 pound	USD	3.1	0.35	5/23/16
Brazil Nut	Conventional	Processed; outer pod and individual shells removed	Worldwide	FOB	1 pound	USD	3.2	0.35	5/23/16
Brazil Nut	Conventional	Unprocessed; outer pod removed only	Worldwide	EXW	1 pound	USD	0.57	0.11	12/15/15
Brazil Nut	Organic	Processed; outer pod and individual shells removed	Worldwide	EXW	1 pound	USD	3.3	0.35	5/23/16
Brazil Nut	Organic	Processed; outer pod and individual shells removed	Worldwide	FOB	1 pound	USD	3.4	0.35	5/23/16
Brazil Nut	Organic	Unprocessed; outer pod removed only	Worldwide	EXW	1 pound	USD	0.65	0.11	12/15/15

protection of the Brazil nut tree, and sustainable management of waste which is generated during harvesting (Union for Ethical Bioproducts, 2021). Candela has also restored 284 acres through organic agroforestry (Candela Organic, 2021). The company notes that ‘On top of the fair market price we pay to our small producers for organic products, over the past years we have distributed \$500,000 to support better living conditions for producers and the communities they live in. This money has gone toward efforts like securing land rights, bettering education systems, improving collection infrastructure, and providing access to health care’ (Candela Organic, 2021).

3) As many users of the resource as possible should participate in making decisions regarding usage

The concessionaire management group, Monitoring Agency for Forest Resources and Wildlife (OSINFOR) has reportedly held reunions annually with the harvesters in order to discuss policies and regulations, but DRFFS has not held any meetings (Willem, Ingram,

Guariguata, 2019). SERNANP invites the Brazil nut concessionaires to an annual meeting before harvest season, to inform them of regulations; and every five years they participate in discussions of the overall master plan of the Brazil nut trade. However, this is limited in how much the concessionaires themselves are involved with decisions. Candela is not directly involved in the concessionaire process, but in the future should work towards incorporating more harvesters in the decision-making process of the company.

Due to the certification process requiring harvesters to organize into associations (such as Candela), this created a sense of ‘unionism’, through which arguably the harvesters had a collective voice to share experiences, develop strategies, discuss certification practices, and pool resources to hire experts in certain areas to help with their harvesting methods (Quaedvlieg, Roca & Ros-Tonen, 2014). However, it can also be argued that harvesters are more vulnerable to manipulation by elite groups for financial or

political advantage (Quaedvlieg, Roca & Ros-Tonen, 2014).

4) Usage of common resources must be monitored

The Madre de Dios region can be split into two groups- protected and unprotected forest areas. As previously mentioned, workers in protected areas are granted concessions through SERNANP, and in unprotected areas by DRFFS. In terms of monitoring of the concessionaires, in the Madre de Dios region outside of the protected reserves, this is conducted by the Monitoring Agency for Forest Resources and Wildlife (OSINFOR), (Willem, Ingram, Guariguata, 2019). Inside the protected reservation, this monitoring is conducted by SERNANP. Between 2009 and 2016, OSINFOR carried out 634 inspections of Brazil nut concessions outside of the Reserve, suggesting that about half of the concessionaires had never been inspected (Willem, Ingram, Guariguata, 2019). Despite this, another monitoring technique used is the mandatory check-in of all concessionaires entering and leaving the Reserve, allowing systematic monitoring before, during, and after the Brazil nut harvesting season (Willem, Ingram, Guariguata, 2019). Though there are some forms of monitoring of Brazil nut concessionaires, there is certainly room for improved monitoring to take place.

In terms of Fairtrade and Organic monitoring, a recent study found that these certifications were associated with better postharvest practices and higher prices for Brazil nuts in the Madre de Dios region, and that combined organic and Fairtrade certification was associated with socioeconomic benefits (Duchelle, Kainer & Wadt, 2014). In addition to higher prices for

organic nuts, the Fairtrade price premium had important social benefits because it was received by and invested back into cooperatives. As Candela is the leading company in the region for Fairtrade and Organic certification, the result of this study furthers the company's recognition, as this study was conducted independently of the organisation, with limited biases.

Independent certifiers audit producers, traders and companies to check compliance with our economic, social and environmental standards, including that producers receive the Fairtrade Minimum Price and Premium. The auditors are highly qualified, based in the region they work in, and are familiar with the local culture, language, and legal system. They are annually tested on their skills, and receive annual Fair-Trade training (Fairtrade International, 2021). The process is as follows: they receive an initial on-site audit before they can sell Fairtrade certified products, an audit report is sent to FLOCERT for evaluation, two further confirmation audits take place, and a renewal audit takes place every three years. On top of this, unannounced audits take place (Fairtrade International, 2021). A similar process takes place with Organic certification. In this instant, we are assuming the certifier is based in the US, so the certification comes from USDA. An accredited certifying agent conducts an in-depth inspection of the site, this is presented to another certifying agent, and then a final report and decision is made (McEvoy, 2020).

5) Sanctions for violators of the defined rules should be graduated

The majority of illegal activities in concessions outside of the protected Reserve are related to timber exploitation. The general

enforcement mechanism used by OSINFOR are fines, varying from 40 500 to 20 250 000 PEN. However, no concessionaires within the Reserve were sanctioned for illegal timber exploitation, as it is completely prohibited, and due to the nature of the Reserve, any illegal logging would be relatively apparent (Willem, Ingram, Guariguata, 2019). To prevent forest crimes OSINFOR organizes workshops on forest regulations; thirty-nine have been organized between 2012 and 2016 (Willem, Ingram, Guariguata, 2019). In terms of violation of the Fairtrade or Organic prerogatives, in theory this would result in the company having the Fairtrade or Organic certification removed, and a potential recall of products if they posed a danger to public health. The auditors would report that the company is not meeting the standards they have outlined in the certification, and their license to use the certification would be revoked. Candela has not been sanctioned so far, so the company therefore is meeting all the certification requirements, at least based on assessments by the auditors.

6) Conflicts should be resolved easily and informally

Unfortunately, it seems that conflicts are resolved with relative ease, due to the power dynamics in the region. The debt cycle which the harvesters enter means that they aren't necessarily in a bargaining position during the harvest season. This is furthered by examples of lack of organizational intervention. According to official documents, disputes about overlapping property rights and unclear concession boundaries were to be directly financed by concessionaires themselves rather than the DRFFS, who did not perceive itself to be responsible for such costs

(Willem, Ingram, Guariguata, 2019). This demonstrates that although conflicts are resolved easily and informally, the result is not necessarily beneficial to the harvesters themselves, and a continual lack of intervention by organizations is likely to cause considerable damage in the future relationships between harvesters and companies.

However, the certification process, such as the one used by Candela, has helped the harvesters gain political capital – the capacity to represent themselves, access information, form associations and participate in political and economic life and networks (Quaedvlieg, Roca & Ros-Tonen, 2014). This gives the opportunity for conflict resolution to be clearer and more established in the future. Furthermore, some of the conflicts over debt have been avoided with the advent of the Candela credit program, which is an interest-free loan without daily accumulation, and which is dependent on the market price of Brazil nuts, rather than a fixed (and often exploitative) price (Collinson, Burnett & Agreda, 2000).

7) Higher-level authorities recognize the established rules and self-governance of resource users

On a global scale, the certification Fairtrade and Organic are widely recognized, as are the labels associated with the certification. Candela Peru has been certified by the international Fairtrade governing body FLOCERT and was the first company in the region to get organic certification, which indicates a level of higher-level authority recognition (Candela Organic, 2021). The Peruvian government has continued to increase the number of concessions it has granted to harvesters, again legitimizing the Brazil nut trade.

In terms of meeting benchmarks outlined by government bodies like the UNCTAD in terms of bio trade, Candela was #1 in Peru with 92% compliance in 2009 (Candela Organic, 2021). Furthermore, Candela Peru has been recognized as an UEBT member, a company which works to implement the Ethical Bio Trade Standard (Union for Ethical Bio trade, 2021).

8) Common resource management should consider regional resource management

In recent years, Candela Peru has expanded substantially. They have a partner organization, Candela Organic, launched in September 2020. Candela Organic produces and exports high-quality butters and oils from Brazil nuts, which enables less waste as they can use more parts of the Brazil nut, and aren't reliant on whole, shelled nuts (Candela Organic, 2021). Candela Peru has offices in Peru, the US, and Europe, and has worked with companies such as L'oreal, Lush, and the Body Shop (Candela Organic, 2021). This demonstrates how an initially locally based company has expanded

on a national and international level. Furthermore, the number of local harvesters they have worked with has been increasing exponentially (Candela Organic, 2021).

In order to synthesize my findings into a visual representation, I decided to 'quantify' my research. To do this, I analyzed my findings for each design principle, and for every fact or figure which supported the design principle, I gave it one tally. This gave me a very rough numerical estimate based on the research which

I conducted, of which I acknowledge there will be shortcomings and potential oversights in facts and figures to substantiate my research. However, based on the data I personally retrieved; this tree map provides a visual representation of which design principles have been better fulfilled than others. Design principle 2 (Rules governing the use of common resources should fit local needs and conditions) and design principle 7 (Higher-level authorities recognize the established rules and self-governance of resource users) had the highest amount of data to support their implementation, whereas design principle 3

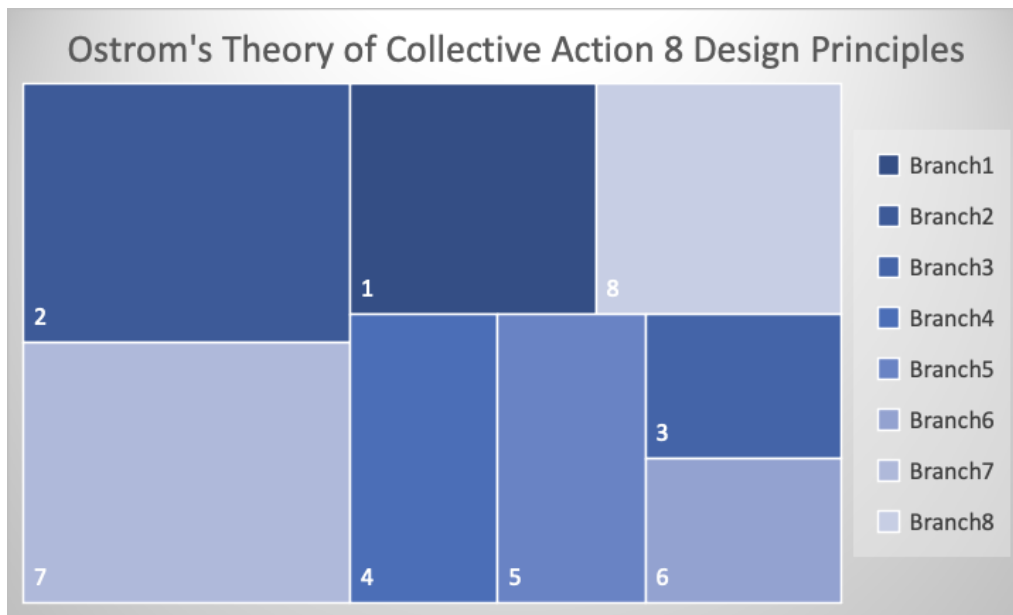


Figure 1. Eight Design Principles tree map.

(As many users of the resource as possible should participate in making decisions regarding usage) and design principle 6 (Conflicts should be resolved easily and informally) had the least. This shows an area that Candela and its certification programs could improve on in order to create a sustainable development of Brazil nut harvesting.

Discussion

In many aspects, the use of ethical certification by Candela to promote sustainable development is in line with the framework that Ostrom proposed. In terms of boundaries and rules which govern its use, the certification programs which are used by Candela fit the Ostrom criteria well. On the other hand, the involvement of harvesters in decision making, the monitoring of the resource, the graduated sanctions, and the conflict resolution are all quite weak, and bring into question the true sustainable nature of the Brazil nut harvesting in the region.

The potential of Brazil nut harvesting to meet the ‘Triple Bottom Line’ needs by providing an income for local harvesters which incentivizes conservation of the forests, thereby providing social, economic, and environmental benefits, is an exciting prospect. However, it is paramount that companies and associations address some of the flaws in the current system. There needs to be a greater effort to foster the voices and beliefs of the harvesters themselves in decision-making processes, and in conflict resolution. The government has given the workers a commendable measure of rights; however, these are useless without proper monitoring and implementation. Companies such as Candela are taking steps in the right direction,

as their use of certification provides an incentive with price premiums, as well as grassroots benefits including a better credit system to reduce the cycle of debt and alter the bargaining power of the workers. Although many studies have noted that the realized impact of certification is small, it still has a positive impact on communities. Finally, Candela’s reforestation approach further adds to the sustainability of their harvest cooperative, as it aims to enhance the abundance of pre-reproductive Brazil nut trees for future generations (Guariguata, Cronkleton, Duchelle et al., 2017).

The results of this study are in line with two other studies conducted in a similar nature, which also used socioeconomic theorems to conduct a holistic assessment of the Brazil nut exploitation in the Amazonian region. The work of Guariguata, Cronkleton, & Duchelle, and the work of Willema, Ingrama & Guariguata explores the Brazil nut industry through a socioeconomic lens, to further assess the viability of sustainable development and trade. Again, the disparities between on-paper rights and regulations, versus the real-life implementation and monitoring are highlighted as the most glaring areas for companies to work on in order to produce a sustainable Brazil nut trade.

It is important I highlight the limitations of this paper. Due to the devastating impact of COVID-19 globally, I was unfortunately unable to attend my internship in person, so could not conduct any of the studies or in-person research which I wanted to. Due to this, I was reliant on online resources. This meant that some of the data which I found is less recent than would be preferred, and my data is reliant on secondary sources. I believe there is scope for quantitative research into the issues I

have raised regarding sustainable Brazil nut harvesting, and I hope I get an opportunity to conduct this at a later stage.

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