



BIO TRADE IN PERU, SUSTAINABLE DEVELOPMENT OF EXPORTABLE NATIVE FRUIT

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Preface and acknowledgement

The thesis research has been presented as the final product that marks the end of study of the Supply Chain Program at Aeres University Applied Science.

Taking advantage of the opportunity, I would like to express my gratitude to the Aéres University, which has given me the opportunity to have such a beautiful experience, and to my colleagues and professors, who have offered me patient aids, as well as to my family and friends that in spite of the distance they have accompanied me and supported me with love.

"Jóvenes peruanos, dad tregua a la política y dedicaos a conocer vuestro país y los inmensos recursos que contiene".

Antonio Raimondi

Table of contents

Preface and acknowledgement.....	2
Table of contents.....	3
Table of figures	5
Table of table	6
Summary.....	7
Chapter 1 – Introduction.....	8
1. Broad framework.....	8
1.1. Topic.....	8
1.2. Developments	8
1.3. Relevance	9
2. Theoretical framework.....	9
2.1. What is known.....	9
2.2. Knowledge Gap.....	13
2.3. Main Question and Sub-Questions	14
2.4. Objective	14
Chapter 2 – Methodology (material and method)	15
1. Type of Investigation	15
2. Universe and Research Sample	16
3. Research Method.....	16
4. Data Collection	17
Qualitative	18
Quantity	18
Topic (WHY).....	19
Indicators (WHAT).....	19
Tool (HOW)	19
5. Processing and Data Analysis	20
Chapter 3 – Results	21
1. Sub question one: Is there a growing demand for Peruvian native fruit that belong to bio trade? 21	
1.1. Growth of the demand in bio trade.....	21
1.1.1. Global Bio Trade Opportuny	21
1.1.2. Buyer trends that affect demand	23

1.2. Increase in Peruvian export belong to Bio Trade	25
1.3. Consume per-capita	29
2. Sub question two: Is there availability of resources for the production of native food of sustainable extraction?	29
2.1. Biodiversity Peruvian- Natural Capital of Peru	29
2.1.1. The Fruits of Peru.....	31
2.2. Threats to the conservation of diversity	34
3. Sub question three: Does the offer of native fruit comply with the three pillars of bio trade? ...	37
3.1. Economic Development of Bio Trade Companies	37
3.2. Enviromental and Social Development of Bio Trade Companies	41
3.2.1. Reference of the profile of companies that have participated in Bio trade projects.....	42
3.2.2. Certification and labelling	44
3.2.3. Governance and environment favorable to Biocommerce.....	45
Chapter 4 – Discussion of results	47
Chapter 5 –Conclusions and recommendations	50
1. Conclusions.....	50
2. Recommendations	52
List of references.....	53
Appendices	56
1. Results of survey.....	56
2. List of Native Peruvian Fruits and Plants	59
3. List of Companies Certificated by Bio Trade Peru	61
4. Record of interviews.....	62
4.1. Interview 01	62
4.2. Interview 02	64
4.3. Interview 03	66
5. Export of Bio Trade Peru.....	69
6. Table Of Acronyms, Acronyms and Abbreviations	73

Table of figures

Figure 1. Product group diagram, Reprinted from UNCTAD, 2007	10
Figure 2. Bio Trade Framework. Reprinted from UNCTAD, 2007	10
Figure 3. Mixed method research design approach. Adopted from Creswell (2012)	15
Figure 4. Reprinted from “ArticleTitle”, by CAF, 2015, Articulación, desafíos y oportunidades de los bionegocios en la adaptación al cambio climático, Volume 1, p. 6.....	21
Figure 5. Q4. Are you aware of the concept belongs to BioTrade? , Survey by own source, 2019	22
Figure 6.Q5.Have you tried it? Or would you try it if it was more targeted towards consumers?, Survey by own source, 2019	22
Figure 7. Q7.The proportion of your spending on agroproduct of this category has increased? Q8. Approximately, how much is the percentage of growth? Survey by own source, 2019	23
Figure 8. Exports of native products of bio trade in Peru value FOB US\$: 2014-2018, own source 2019	25
Figure 9. Exports of native products of bio trade in Peru volume tons: 2014-2018, own source 2019	26
Figure 10. Main Destination of Peruvian Bio Trade, own source 2019	26
Figure 11. Native Biodiversity Exports 2014-2018 FOB millions USD per Countries, Adapted from SIICEX 2018 and PROM PERU 2019	27
Figure 12. Evolution of Main Products of Native Biodiversity Export 2014 - 2018 US \$million FOB, Adapted from PROM PERU 2019.....	28
Figure 13. Evolution of Main Products of Native Biodiversity Export 2014 - 2018 volume tons, Adapted from PROM PERU 2019	28
Figure 14.Graph of Income per-capita of the main international markets of the agricultural sector Bio trade 2009-2018. Own elaboration based on World Bank Statistics 2019	29
Figure 15. Fruit Native Species By Antonio Brack, Adapted from Diccionario de Frutas y Frutos del Perú, 2012.....	31
Figure 16. Regions of Fruit Native Species By Antonio Brack, Adapted from Diccionario de Frutas y Frutos del Perú, 2012.....	32
Figure 17. Current distribution of BioTrade products, Reprinted from Biocomercio Peru by PROM PERU	34
Figure 18. Global Cosmetic Products Market – Analysis of Growth, Trends and Forecast 2018-2023, Adapted from Trade and Biodiversity Conservation by UNCTAD	38
Figure 19. Use of Add Value of Bio product in Peru	38
Figure 20.Main products worked by bio trade companies, Based on MINAM 2015.....	39
Figure 21. Type of initiatives	42
Figure 22. Percentage of participating companies	42
Figure 23. Economic sectors bio trade companies.....	42
Figure 24. Companies by market segment.....	42
Figure 25. Satisfactory compliance of Conservation of Biodiversity, based on MINAM, 2015.....	43
Figure 26. Satisfactory compliance of Sustainable Use of Biodiversity, based on MINAM, 2015	43
Figure 27. The National Program of Promotion of BioTrade (CNPB)	45
Figure 28. Bio Trade as a tool to mainstream biodiversity into the economic sectorsd. Reprinted from Trade and Biodiversity Conservation, Report of the IV BioTrade Congress.by UNCTAD,217	46

Table of table

Table 1. Collection tool by type of research method.....	18
Table 2. Selection of data collection techniques	19
Table 3. Exportable Offer of Bio Trade Products in Peru. Experiencia del Biocomercio en el Perú: Estrategia Nacional de Biocomercio y su Plan de Acción al 2025. Reprinted from UNCTAD 2016 ..	32
Table 4. SWOT analysis of the agro-export sector in Peru, 2015 Reprinted from El sistema de agronegocios en el Perú: De la agricultura familiar al negocio agroalimentario source MINAGRI y MINCETUR, by Castro, H 2016	35
Table 5. Source: UNCTAD, 20 years of BioTrade Magazine, Trade and Biodiversity Conservation – 2016	37
Table 6. Peruvian Biotrade Products with added value	40

Summary

BioTrade is a business model that promotes protection, conservation and use of native biodiverse resources, implemented through the fundamental pillars of sustainability. Within that context, the purpose of the present thesis is to account for the sustainable viability of the exportable, native products that belong to Peruvian biodiversity.

The investigation regards the fact that BioTrade demand is growing, that resources or raw material are available in Peru and the three pillars of BioTrade in exporting companies are fulfilled.

Within the subject in question, the global trend of the BioTrade market is analysed and explained, together with the behaviour of Peruvian exports belonging to BioTrade in the last five years. Also, the availability of native resources and threats to the conservation of diversity are identified. Finally, economic profitability, biodiversity conservation and considerations of social aspects are reviewed.

The research is based on evaluations of exporting companies in BioTrade programs and projects, qualitative interviews with Peruvian BioTrade specialists, consumer surveys and bibliographical research.

The results determine the sustainability of exports of native fruits derived from BioTrade. The main conclusion of the research is that commercial development of BioTrade companies and contribution to biodiversity conservation is due to the adoption of sustainable business practices. However, even more must be done to guarantee the product quality through certifications as a strategy to incorporate an extra value.

Finally, it is concluded that BioTrade in Peru is able to consolidate itself by a sustainable development strategy, despite the difficulties that exporters face due to new trade rules and limitations in research on the subject.

Chapter 1 – Introduction

1. Broad framework

1.1. Topic

The present research entitled "Biotrade in Peru, Sustainable Development of Exportable Native Fruits", aims to show the sustainable export of native fruits from Peruvian biodiversity. The research is descriptive and analytical: it is intended to present the current situation of BioTrade and Sustainable Development in Peru.

Biodiverse resources are found in very poor areas, although they possess great added value. These resources open up a range of opportunities for the high Andean and jungle areas of Peru to improve their quality of life. Therefore, promoting and implementing bio-business should fulfill three fundamental objectives: conserve the environment, reduce poverty and generate economic value to the actors involved (Fairlie, A, 2013).

1.2. Developments

In the Convention on Biological Diversity (CBD) in 1992, the importance of biodiversity is expressed in its objective itself: "The conservation of biological diversity, the sustainable use of its components and the fair and equitable distribution of the benefits derived from the use of genetic resources" was universally recognized (United Nations, 1992). In consequence, the United Nations Conference on Trade and Development (UNCTAD) created the BioTrade initiative with the objective of stimulating trade and investments in biological resources with a focus on sustainability. Since then, policies are being made to promote the development of BioTrade, mainly in Latin American countries, considering that they are a source of great wealth and biodiversity (UNCTAD, 2016).

12000 companies in more than 70 countries have signed up to the United Nations Global Compact, committing to greater environmental (and biodiversity) responsibility. The number of companies that report on biodiversity in their annual reporting is growing. 36 of the top 100 cosmetic companies and 60 of the top 100 food companies now mention biodiversity. (UNCTAD, 2017). Although biotrade in Peru is still recent, it has managed to position many biodiverse products (aguaje, native cocoa, camu camu, chestnut, andean grains, sachá inchi, maca, etc.) in the local and especially international markets (MINCETUR, 2018).

According to the Peruvian Commission for the Promotion of Exports and Tourism (PROMPERÚ), BioTrade could allow the world to know the great potential and revaluation of Peruvian native resources (Andina Agencia Peruana de Noticias, 2016). As one of the twelve megadiverse countries in the world, Peru has great potential to develop activities based on natural products and ingredients which can attract investors (Mittermeier et al., 2005). Peru concentrates in its territory a great natural heritage and a recognized biological wealth, but their real dimensions have not yet been determined so far. It is the fifth country in the world in number of total species; first country in number of plant species with known

and used properties by the population (4,400 species) and first country in domesticated native species (128 species) (Acero Villanes, 2009).

It is crucial to know the benefits of bio-commerce both in the economic aspect, as in the social and environmental aspects. Regarding the economic issue, good results can be seen: according to United Nations Environment Programme (UNEP), it is "predicted that exports will grow 40% by 2020 and that international sales would increase by about 110 million in 2009 to about 2.7 billion dollars in 2020". In the social aspect, there is an increase of new jobs that is around 250 thousand in the poorest areas of the country. In addition, there is a greater assessment of farmers' work by regional, central authorities and consumers themselves (Fairlie, A, 2013). In the environmental aspect, native species are being valued with innovation techniques that improve their production and are friendly to the environment. Likewise, good agricultural practices and the conservation of species and ecosystems have been promoted.

Being the native food export one of the contributions of the economic growth in a country, and bio trade one of the world-wide tendencies, the study attempts to know if there is a relation of both to sustainable development. For this purpose, research tools such as in-depth interviews, data collection and bibliographic research were used. In addition, the results obtained from the demand in the global market, the evolution of bio trade, the behavior of exports, the availability of native resources, as well as seeking solutions for sustainable development are reviewed in Peru.

1.3. Relevance

The main reason that gave rise to the thesis arises from the education received at Aeres University, because it is recognized that foreign trade in food is one of the ways of generating profits and development to a country. Likewise, social and environmental participation in the BioTrade business model as a fundamental concern for consumers. As a result, an interrogation arises. How important is the export of bio trade native fruit for sustainable development? In addition, this research could help encourage exporters to diversify the "export of native products" and develop a business model such as BioTrade that contributes to the conservation and care of natural resources. Finally, it is crucial to understand that there are native Peruvian natural resources with high value in food and industry.

2. Theoretical framework

2.1. What is known

First of all, it is necessary to have defined the following concepts:

- **BioTrade** refers to those activities of collection, production, transformation, and commercialization of goods and services derived from native biodiversity under the three fundamental pillars of sustainability: environmental, social and economic (United Nations, 2007) Also, biotrade or sustainable trade in biodiversity is a business model that takes into

account the three fundamental pillars of sustainability: economic profitability, biodiversity conservation and the consideration of social aspects. (Comisión de Promoción del Perú, 2014)

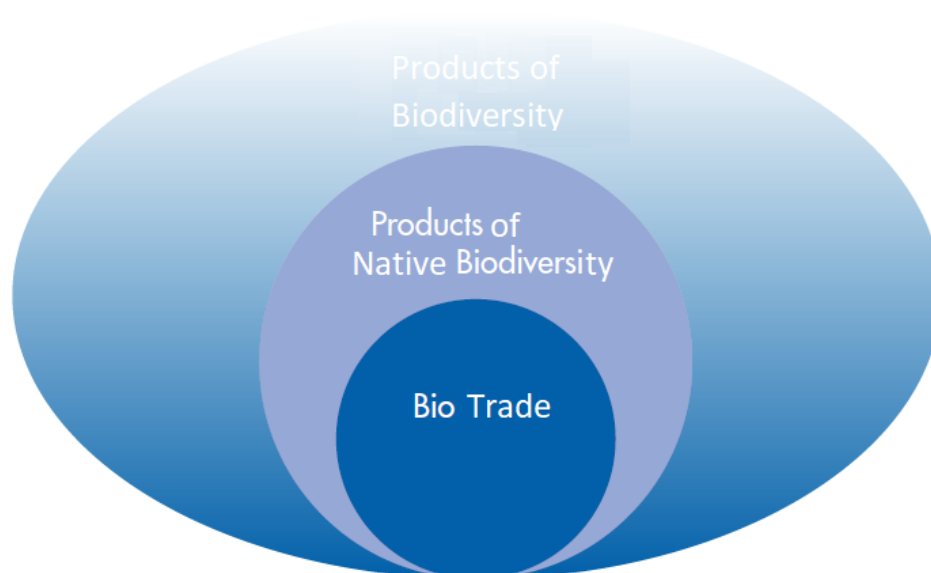
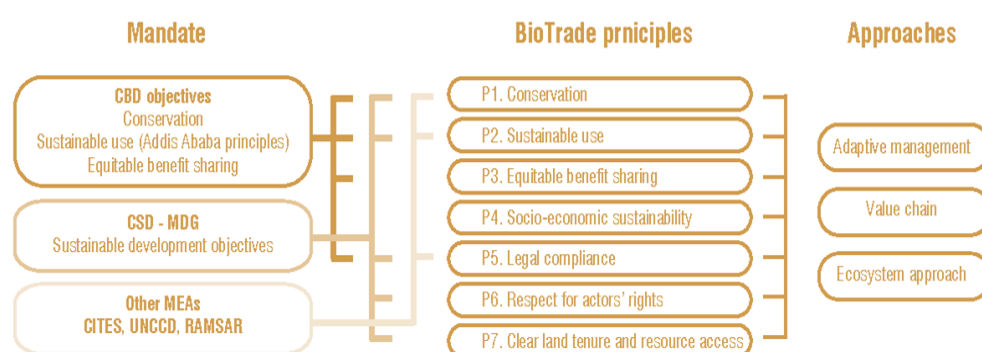


Figure 1. Product group diagram, Reprinted from UNCTAD, 2007



Source: UNCTAD, 2007.

Figure 2. Bio Trade Framework. Reprinted from UNCTAD, 2007

- **International Trade**, also called foreign trade or world trade, refers to the movement of goods and services between different countries and their markets. In recent decades, with the flourishing of financial science, international trade also includes the movement of capital on some occasions. However, the present work focuses more on movements (imports and exports) of goods, the field where bio trade is located (Samuelson & Nordhaus, 2010)
- **Native Biodiversity** the native diversity is defined as the genetic resources, species of flora and fauna, and ecosystems that are native to a territory or that are in a country, and that have developed particular conditions in their process of adaptation to the local ecosystem

(United Nations, 1992). The native biodiversity of flora and fauna can be subdivided into wild and domesticated species.

- **Nagoya Protocol** on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is a supplementary agreement to the Convention on Biological Diversity. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. (UNCTAD, 2016).

- **Sustainable Development**

There are several definitions of sustainable development), however, the most accepted is the one proposed by the World Commission for Environment and Development, and published in the Brundtland Report (Brundtland, G. H., 1987): "Sustainable development is one that satisfies development the needs of the present, without compromising the ability of future generations to meet their own, and implies two fundamental concepts:

- 1) The concept of needs, especially the needs of the world's poor ...; and
- 2) The idea of restrictions imposed by the current state of technology, social organization and the capacity of the environment to meet present and future needs. "

This concept raises the following equity problems:

- Equity between human well-being and ecological balance.
- Equity in income distribution; seeks to eliminate the problem of poverty.
- Equity in the rights of present and future generations.
- Equity between human settlements for quality housing and sustainable development of human resources.
- Equity in the use of natural resources renewable and non-renewable.
- Equity to avoid causing an environmental crisis that irreversibly affects the ecology.

In this way, the concept of development sustainable assumes that the economic, social and environmental objectives of development must be defined in terms of sustainability and three basic dimensions can be identified and interrelated development, which constitute complementary aspects of the same agenda (Pichs, R., 2000)

- Economic sustainability.
- Social sustainability.
- Environmental sustainability.

The three areas fundamental implicit in such a concept is embodied in the Brundtland Report, in a synoptic chart where human well-being is related, the ecological well-being and interactions. It is about of an integrated approach to economic and environmental performance, where economic growth should be enough to solve the problem of poverty and. In parallel, sustainable should be enough for avoid an environmental crisis. Also, it

considers both equity between present generations as intergenerational equity that involves the rights of future generations. (Salcedo Guzmán, M. P., San Martín Reboloso, F., & Barber Kuri, C. M., 2010)

In the 80's the industry claimed that the development of an economy negatively affected the environment, however, the UN and the World Bank proposed the concept where "the environment and development are concepts that are not looked at separately within the current context of the economy, and that this supports in a positive way for the sustainable economic development of a nation." (Andean Community, 2010). Given the above, the preservation and non-contamination of the environment is a restlessness that encompasses all economies. In Peru, measures imposed have a long-term projection with results that are progressing slowly.

▪ **Biological diversity in Peru**

Biological diversity is concentrated in certain regions of the world called megadiverse. Due to geographical, ecological and climatic issues, countries such as India, China, Brazil, Mexico, Peru, Indonesia, Australia, Colombia, Ecuador, Venezuela, Madagascar, USA, among others, harbor in their territories the highest concentrations of ecosystems, species and diversity at the gene level (Llorente-Bousquets y Ocegueda , 2009).

Peru concentrates in its territory a great natural heritage and a recognized biological wealth but whose actual dimensions have not yet been determined so far. According to information provided by the National Biodiversity Strategy of Peru, our country concentrates 84 Natural Life Zones and 11 natural ecoregions, also registering a great biodiversity of flora with approximately 25,000 species (10% of the world total) of which 30% are endemic. (Acero Villanes, 2009).

▪ **Biotrade in Peru**

Meanwhile, citizens, through the consumption of organic products, which contribute socially, encourage the generation of supply that meets these requirements, having a faster and more sustainable effect.

How has Peru responded? Peru is a participant in the biotrade products supply, for the 2010 already had more than 50 export products from the three natural regions of the country (Comisión de Promoción del Perú, 2014). COP 20 highlighted biotrade as a tool for the development of Peru, since Peruvian biological diversity facilitates the growth of biotrade. (FAO, 2016). Peruvian export in biotrade has increased and has since diversified; "The growth of this market closed 2018 in the United States alone \$ 460 million with sales of natural foods and medicinal and aromatic plants" (MINCETUR, 2018). The growing demand for organic products among global consumers helped boost biotrade sales from just \$ 40 million in 2003 to more than \$ 5 billion in 2016. Such growth offers huge opportunities for Peru.

Biotrade links to sustainable development, poverty, nutrition and environmental impacts keeps the agro sector at the center of numerous national and global policies. In this context, Latin

America managed to export US \$ 1.08 billion and registered a growth of 9.9% last year. However, the increase was lower than in 2017 with 12.2%. Also, it was lower than the growth of world trade with 11.6% in the same period of the previous year. (Banco Interamericano de Desarrollo & Sector de Integración y Comercio, 2019). However, the inclusion of non-traditional food grows every year. In Peru, non-traditional agricultural exports reached 5,909 million dollars in 2018, an amount higher by 15.2% than in 2017 (Banco Central de Reserva del Peru, 2019)

In other hand, Peru has a National BioTrade Strategy and an Action Plan by 2025 elaborated by The Ministry of the Environment (MINAM) which includes policies and rules for the promotion and implementation of these activities, considering the powerful development of the offer and the markets, among other axes thematic issues related to this matter. (MINAM, 2014).

2.2. Knowledge Gap

Peru faces great paradigms associated with agricultural development: on the one hand, reducing poverty in rural areas and on the other hand, to value the natural capital of the country with the greatest biodiversity on the planet. The areas with the greatest biotrade native products are found in the Amazon, factors that affect agricultural productivity and pose new adaptation challenges and mitigation responsibilities.

Given this, the question for this research is: *How would sustainable develop export Peruvian fruit derive from the native biodiversity that belongs to the biotrade?*

In order to obtain a more solid view of the subject presented, it will be necessary the knowledge if sustainable development in Peru is possible from the demand for native food. It is known that traditional food has a growth in the foreign market but not the contrast to the local market and its diversification.

If the growth trend of native foods in the following years is positive, it will be necessary to evaluate if there are resources for the supply of native products with sustainable extraction that ensures availability or critical risk factors for producers.

It is known that the government has been working on protocols and programs to ensure sustainability in the country, it is not known how many, when and in what proportion producers have received this benefit.

Finally, native foods that maintain the biotrade seal comply with the three pillars of organic trade and to what extent.

2.3. Main Question and Sub-Questions

To know if there is the possibility of sustainable viability of exportable offer of Peruvian food native biodiversity, belonging to model of business bio trend; the questions that will allow us to obtain a more unfathomable vision of the subject are presented:

- a. Is there a growing demand for Peruvian native food that belongs to bio trade?
- b. Is there availability of resources for the production of native food of sustainable extraction?
- c. Does the offer of native food comply with the three pillars of bio trade?

There is environmental concern which has given rise to demand for products and services that contribute to their care; thus products belonging to bio trade have gained importance and popularity among consumers. It is reflected in the increase in demand worldwide, which is covered by the supply offered by various nations. Faced with this, the question for this research is:

How would exportable Peruvian product derived from the native biodiversity that belongs to the bio trade develop sustainably?

2.4. Objective

A. General Objective

Demonstrate if possible, the development sustainable bio trade from exportable offer Peruvian food derived from the native biodiversity

B. Specific Objectives

- Demonstrate the existence of growing demand for food, derived from the native biodiversity that belong to the bio trade.
- Demonstrate the existence of availability of resources for the technical elaboration of the food derived from the Peruvian native biodiversity, of sustainable extraction.
- Demonstrate that the offer of food, derived from Peruvian native biodiversity complies with the three pillars of bio trade.

Chapter 2 – Methodology (material and method)

Taking into consideration that the research objective is to demonstrate that it is possible to develop an exportable fruit supply derived from the native biodiversity that belongs to bio trade; it was determined that the research is non-experimental transversal in the descriptive category.

1. Type of Investigation

- **Quantitative:** Because it is intended to perform the collection of quantitative data for the demonstration of the first specific question, in the analysis of historical data of the evolution of Peruvian exports in food that belongs to bio trade; the interpretation of results on the variation in per capita expenditure allocated to these products.
- **Qualitative:** Because information was incorporated depending on the dependent variables, using the technique of description, analysis and discourses (interviews), about the characteristics of the target market, style of consumption and preferences of this; in addition, of the potential alternatives of potential native inputs derived from Peruvian biodiversity.

For the present study, **technique** was used:

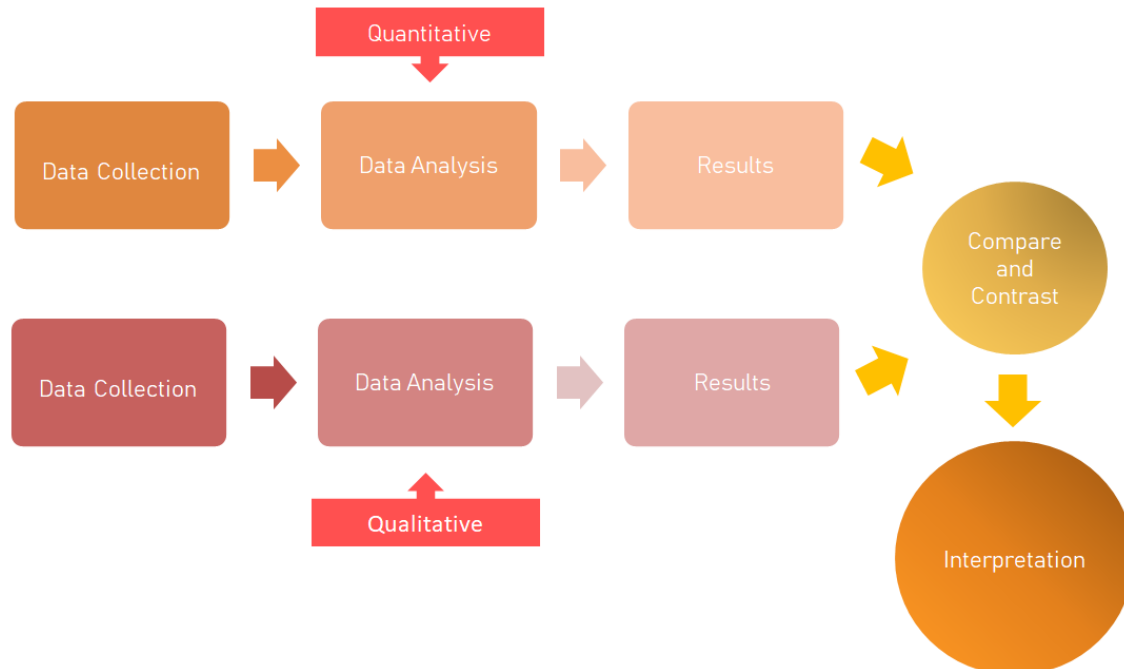


Figure 3. Mixed method research design approach. Adopted from Creswell (2012)

2. Universe and Research Sample

Study population as the universe of the population is aimed at consumers residing outside of Peru, their lifestyle enters the eco-trend and purchase products from biotrade, it is detailed that the population is unknown. Likewise, it is complemented with the opinions of authorities that know the characteristics of the target market, as well as the opinion of professionals in Peruvian biodiversity for the indication of input alternatives for the ultimate goal.

The sample was determined statistically. Where the population is unknown, the sample size can be derived by computing the minimum sample size required for accuracy in estimating proportions by considering the standard normal deviation. It works with a 95% Confidence Level, a Sample Error of +/- 4.5% and a Sample Proportion of 50%. The sample size for the present study would be 144 units, which is equal to 144 consumers between 20-35 years old, residing outside Peru, who purchases bio trade products.

$$n = \frac{Z_{1-\alpha/2}^2 * p (1 - p)}{E^2}$$

Where:

- $Z_{\alpha}^2 = 1.959964^2$ (When the level of trust is of 95%)
- p = Probability of success (50% = 0.5 recommended)
- E = Estimation error
- n = Sample size or number of surveys to be conducted
- N = Total Population

Replacing the data, we then have:

$$n = \frac{1.959964^2 * 0.5 (1 - 0.5)}{0.045^2}$$

$$n = = 143.34 <> 144 \text{ (Round for excess)}$$

3. Research Method

- **Analytical Method.** The evolution of the GDP of Peru as well as native food exports to FOB value was analyzed based on the description and explanation of both variables. The analysis of Peru's consumer price index, the price index of the most representative sustainable market country and the binational real exchange rate index also was considered.
- **Historical Method.** The analysis was based on an annual study period of the last five years. However, it is necessary to analyze the same period for the econometric analysis, but on a monthly, trimester or annual basis.

It is specified that, given that it cannot be specified the future years and since the data could not be found with a reliable statistical base, it was projected taking as reference the last three previous years, in order to consolidate a homogeneous data for its respective analysis.

4. Data Collection

The research was elaborated using strategies based on the previous theoretical propositions mentioned, data and content analysis, the description of the case and the use of qualitative and quantitative information, mainly from sources of secondary information.

However, also **primary sources of** information were used, through semi-structured interviews with some of the most representative actors of the fruit production chain in Peru.

Interviews were conducted with 144 people (based on sample size of unknown population) of different nationalities according to the sample. This was carried out the 4th week of June and 1st of July and I will make use of a questionnaire for fill answers of survey (Table 2)

The procedure to apply data collection according to the type of sampling would be as follows: Application of a questionnaire that groups together questions aimed at the purchasing factors handled by the unit of analysis; per capita consumption and the level of perception with respect to the greater expenditure on native food coming from bio trade. (Appendix 1) This questionnaire will focus on the market study of the native food export sector related to the pillars of bio trade.

Special care will be taken to ensure that the respondent answers freely and voluntarily, ensuring that the answers are accurately recorded.

The **primary information** will be obtained through semi-structured *interviews* (Appendix 5) with the main actors of the fruit sector innovation system in Peru:

- AGROIDEAS (belongs to the The Ministry of Agriculture and Irrigation of Peru (MINAGRI)
- INNOVATEPERU (belongs to PRODUCE),
- Development in Exportation-Mincetur, The Ministry of Foreign Trade and Tourism of Peru (MINCETUR)
- General Directorate of Biological Diversity | Bio Trade Specialist - Ministry of the Environment.
- The Consortium of Producers of Fruits S.A. (CPF),

And due to the scale of the non-traditional sector innovation system in Peru, in terms of the distribution of its actors, since they are distributed at the national, regional and local levels, a selection of the most representative main actors of the system has been made. These actors were previously identified and selected through the mapping of actors in the supply chain in Peru.

The *questionnaire* will be applied to the chosen sample. (Appendix 1)

The **secondary information** used in this research is mainly general literature on innovation systems; specialized publications related to fruit; database of national funds for competitiveness: Compensation Program for Competitiveness (AGROIDEAS) and the National Innovation Program for Competitiveness and Productivity (INNOVATE-PERU), on the non-traditional fruit projects that have been implemented in Peru between the periods of the last five years. Also, use of market research conducted by government and private companies. The **main sources of secondary information** used come from:

- National Institute of Statistics and Informatics (INEI),
- National Superintendence of Customs and Tax Administration (SUNAT),
- Ministry of Agriculture and Irrigation (MINAGRI),
- Ministry of Production (PRODUCE),
- Compensation Program for Competitiveness (AGROIDEAS),
- National Innovation Program for Competitiveness and Productivity (INNOVATE-PERU),
- German Agency for Technical Cooperation (GIZ),
- National Council for Science, Technology and Technological Innovation (CONCYTEC),
- United Nations Organization for Agriculture and Food (FAO)
- World Bank, RaboBank, , Inter-American Development Bank (IADB),
- Technological Innovation Center for Tropical Fruits and Medicinal Plants (CITE Tropical Fruit).

Table 1. Collection tool by type of research method

Qualitative	Quantity
Science research, reports, book referring to Latin American trade, agro industrial fruit and its contribution to the population by the scientific base	The statistical reports of exports in the world of the different international institutions in the world,
Specialized magazines of economy, banking entities and agroindustry that represent or focus on the Latin region by scientific base	Rating scale or closed question on a interview as numerical data or data in categories
Open-ended questionnaires on in programmed interviews using e-mails, chat, video calling, etc.	Histograms, tables y pictures or graphics contracted from a raw data o statistics , adapted or modified

Table 2. Selection of data collection techniques

Topic (WHY)	Indicators (WHAT)	Tool (HOW)
Demand international growing of food bio trade	<ul style="list-style-type: none"> ▪ Increase in per capita consumption ▪ Increase in exports ▪ Growth of the demand in bio trade 	<ul style="list-style-type: none"> ▪ Survey (Appendix 1) 4ht week of June and 1st week of July, digital and papers ▪ Secondary Sources ▪ Database of Trade Map ▪ Interviews (Appendix 5) 1st week of July
Sustainable extraction of the native resource of Peruvian biodiversity	<ul style="list-style-type: none"> ▪ Input is of Biodiversity Peruvian ▪ Exist scalability for export ▪ Withdrawal no entails destruction in the environment. 	<ul style="list-style-type: none"> ▪ Interviews (Appendix 5) 1st week of July ▪ Secondary Sources ▪ Research Results
Pillars of bio trade	<ul style="list-style-type: none"> ▪ Economic Benefit ▪ Environmental Benefit ▪ Social Benefit 	<ul style="list-style-type: none"> ▪ Interview (Appendix 5) 1st week of July ▪ Secondary Sources ▪ Survey (Appendix 1) 4ht week of June and 1st week of July, digital and papers

5. Processing and Data Analysis

For the processing of data and the presentation of tables and final graphics, they were exported indiscriminately to Microsoft Office applications (Excel, Word and Power Point), given the flexibility and the best finishes in the presentation of the final report. The interesting thing about this phase is the ability and the researcher's ability to select those relevant data, inputs that later served to interpret the results. To do this, the data processed from the different governmental, international or private institutions are collected. The SPSS software was used for the statistics.

Annualized data distributions were used, that is, some ratios (indicators) was used to see the annualized incidence level of native product exports to the economic growth of the country.

Chapter 3 – Results

The present investigation aims to verify if the development of a exportable offer of native fruits, derived from the native biodiversity that belong to the bio trade. For this, three sub-questions have been established, to indicate if an exportable supply is viable, these are the increase of international demand in bio trade, the existence of resources in the biodiversity of the country and if the companies fulfill the three pillars of bio trade.

1. Sub question one: Is there a growing demand for Peruvian native fruit that belong to bio trade?

1.1. Growth of the demand in bio trade

1.1.1. Global Bio Trade Opportunity

According to Development Bank of Latin America (CAF), the commerce of biodiversity opportunity can be found in the **people**, millions who have the desire and are willing to pay differentiated prices for healthier products and committed to fair trade and sustainability and also, **industries** which are rethinking their strategic positioning and redefining their value chains. The bio trade **generates** more than US \$ 5.2 billion in sales in 2012 (UNCTAD, 2016)

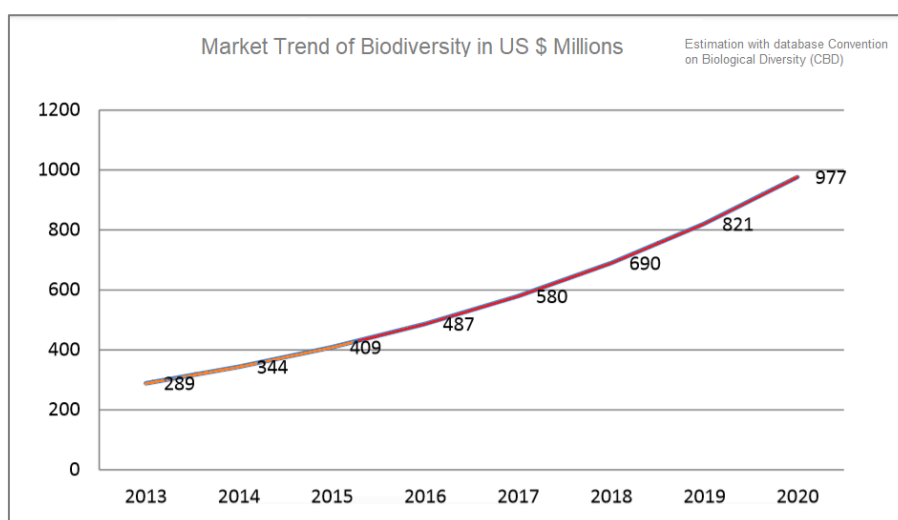


Figure 4. Reprinted from “ArticleTitle”, by CAF, 2015, Articulación, desafíos y oportunidades de los bionegocios en la adaptación al cambio climático, Volume 1, p. 6.

According to the graph, the trend of sustainable business associated with products of biodiversity has an annual growth of 19%. In addition, the growth projection would reach the US \$ 1 trillion by 2020. (Development Bank of Latin America, 2015)

As reported by Euromonitor, globally healthy foods continue to outperform their counterparts with sales expectations of 5% growth per year between 2017 and 2020.

By 2050 (in 2008 prices), sustainability-related global business opportunities in natural resources (energy, forestry, food and agriculture, water and metals) will be US\$ 2-6 trillion as estimated by The Economics of Ecosystems and Biodiversity (TEEB) Report for Business - Executive Summary 2010.

Also, organic food and drink sales reached 97 billion US dollars in 2017 according to Ecovia Intelligence. Although organic food sales are growing at a healthy rate, there are still persistent challenges. These include rising number of standards, demand concentration (about 90 percent of sales are in North America and Europe, supply shortfalls, and competing eco-labels, to name a few. (Research Institute of Organic Agriculture FiBL, 2019)

Three **leading sectors** of rapid development in this business, as opportunity to generate agricultural models based on biodiversity with sustainable practices, are:

- **Functional and healthy foods:** The global market for organic products amounted to \$ 72 billion dollars (IFOAM, 2015) Main markets United States, Japan, United Kingdom and Germany.
- **Natural Cosmetics:** annual growth of 9%, the world demand for organic personal care products reached \$ 7.6 billion in 2012 with a growth to \$ 13.2 billion in 2018 (Transparency Market Research, 2013).
- **Natural Pharmaceutical Products:** the value of the global exchange of natural medicinal products was \$ 65 billion dollars (WTO, 2009)

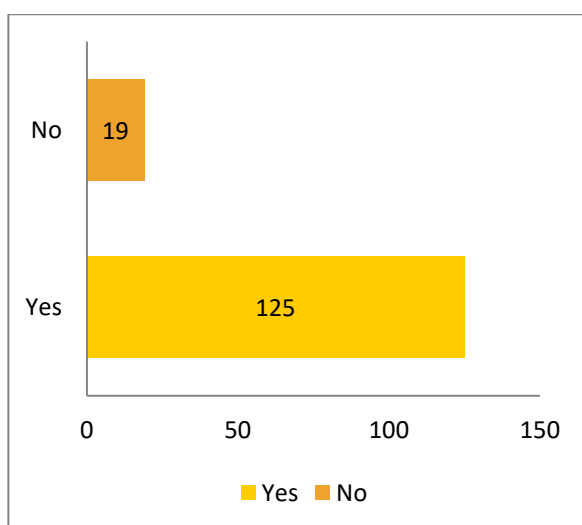


Figure 5. Q4. Are you aware of the concept belongs to BioTrade?, Survey by own source, 2019

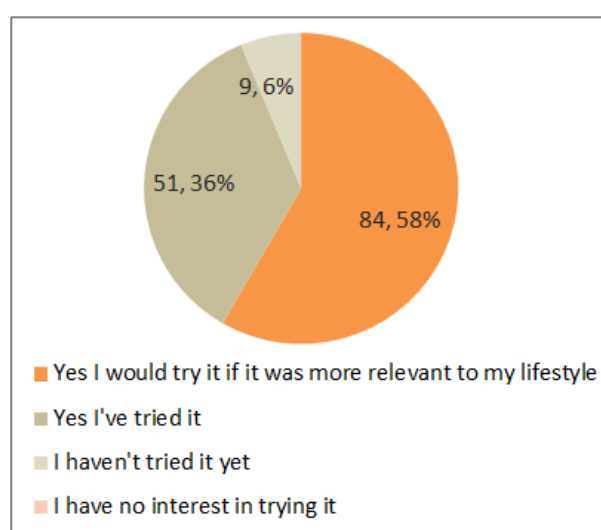


Figure 6. Q5. Have you tried it? Or would you try it if it was more targeted towards consumers?, Survey by own source, 2019

According to the results of the survey question Q4, it was found that 87% are aware of the concept of biocommerce. In Q5 result, 58% of surveyed indicated that they consume or consume products of the biotrade because it is part of their lifestyle, 35% of surveyed is consuming it normally. and 6% of surveyed has at least the interest to consume it.

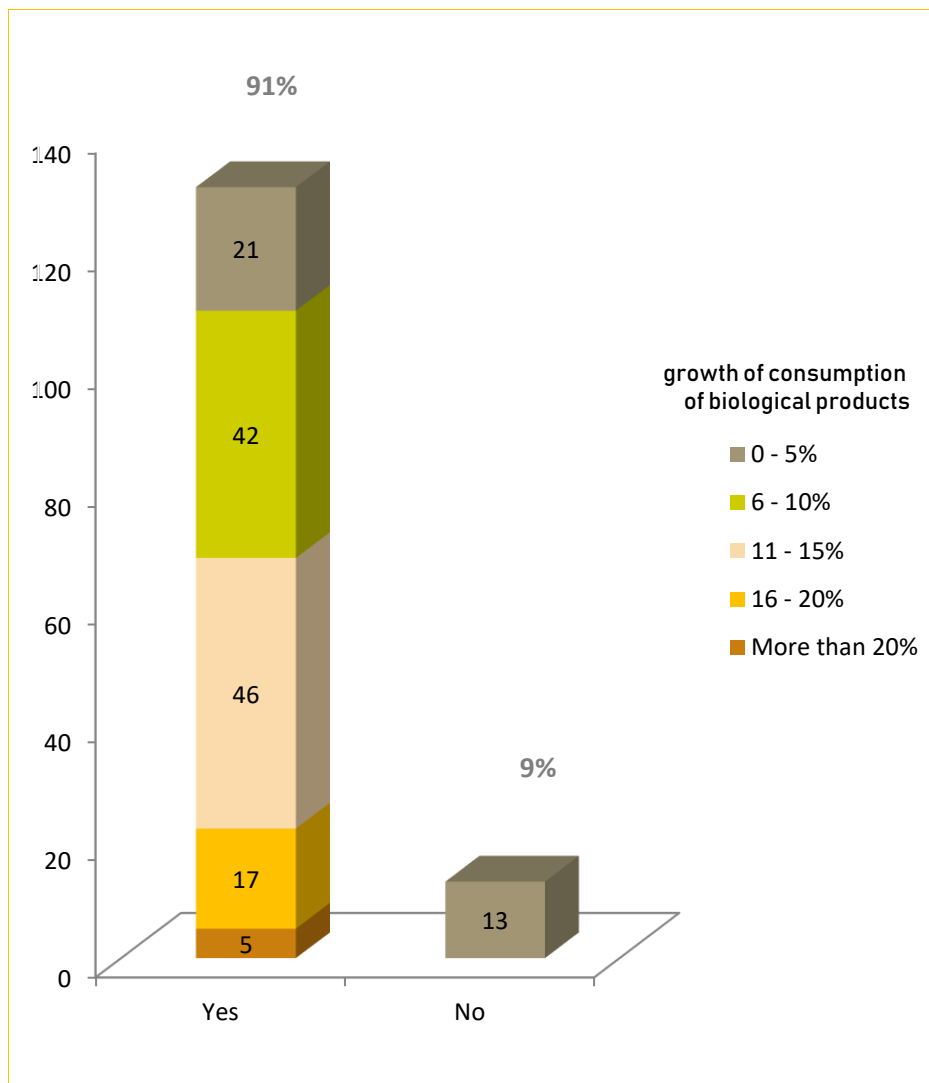


Figure 7. Q7.The proportion of your spending on agroproduct of this category has increased? Q8. Approximately, how much is the percentage of growth? Survey by own source, 2019

Demand growth is reflected when there is a greater proportion of consumption expenditure. The Q7 result shows that 91% of surveyed has increased the purchase of bio trade products. The highest consumption growth belongs to the 11-15% group with 46 consumers surveyed. Second, the 6-10% group with 42 consumers and the 16-20% group with 21 consumers.

1.1.2.Buyer trends that affect demand

For this sub-section, it was used the information on the trends of consumers of biological products surveyed. (Annex 1) Through the questionnaire was build variables indicate environmental and social behavior and awareness, biological products buying trend, price sensitivity and purchase characteristics that determine the demand for bio trade products.

a. Chi-Square test for independence between demand and consumption reasons of the bio consumer

H1: Yes, there is a variation in the demand for biotrade derived from native biodiversity; before the variation of the consumption reasons of the bio consumer.

H0: there is not variation in the demand for products of the biotrade derived from native biodiversity; before the variation of the consumption reasons of the bio consumer.

The objective is to test if there is a direct variation in the demand for biotrade products derived from native biodiversity; before the variation of the consumption reasons of the bio consumer. For this, it was necessary to apply the hypothesis test, through the method of independence of chi-square with a level of significance of 5%.

A critical value of 15,5073 was obtained for a Chi-Square of v : 8 degrees of freedom (v an integer > 0); while the calculated χ^2 value for the data obtained was 16.65 ($\chi^2 \geq 0$). Therefore, the hypothesis H1, which postulates that "yes, there is a variation in the demand for biotrade derived from native biodiversity; before the variation of the consumption reasons of the bio consumer".

b. Chi-Square test for independence between demand and price

H1: Yes, there is variation in the demand for products of the biotrade derived from native biodiversity; before the variation of the price.

H0: there is not variation in the demand for products of the biotrade derived from native biodiversity; before the variation of the price.

The objective is to test if there is a direct variation in the demand for biotrade products derived from native biodiversity; before the variation of the price. For this, it was necessary to apply the Hypothesis Test, through the method independence of chi-square with a level of significance of 5%.

A critical value of 15,5073 was obtained for a Chi-Square of v : 8 degrees of freedom (v an integer > 0); while the calculated χ^2 value for the data obtained was 11.64 ($\chi^2 \geq 0$). Therefore, the hypothesis H0, which postulates that "there is not variation in the demand for products of the biotrade derived from native biodiversity; before the variation of the price".

c. Chi-Square test for independence between demand and social consciences

H1: Yes, there is a variation in the demand for biotrade derived from native biodiversity; before the variation of the social conscience.

H0: there is not variation in the demand for products of the biotrade derived from native biodiversity; before the variation of the social conscience.

The objective is to test if there is a direct variation in the demand for biotrade products derived from native biodiversity; before the variation of the social conscience. For this, it was necessary to apply the hypothesis test, through the method: independence of chi-square with a level of significance of 5%.

A critical value of 12,5916 was obtained for a chi-square of v : 6 degrees of freedom (v an integer > 0); while the calculated χ^2 value for the data obtained was 13.36 ($\chi^2 \geq 0$). Therefore, the hypothesis H1, which postulates that "yes, there is a variation in the demand for biotrade derived from native biodiversity; before the variation of the social conscience".

d. Chi-Square test for independence between demand and environmental consciences

H1: Yes, there is a variation in the demand for biotrade derived from native biodiversity; before the variation of the environmental conscience.

H0: There is not variation in the demand for products of the biotrade derived from native biodiversity; before the variation of the environmental conscience.

The objective is to test whether there is a direct variation in the demand for biotrade products derived from native biodiversity; before the variation of environmental awareness. For this, it was necessary to apply the hypothesis test, through the method: independence of the chi-square with a significance level of 5%.

A critical value of 15,5073 was obtained for a chi-square of v : 8 degrees of freedom (v an integer > 0); while the calculated χ^2 value for the data obtained was 17.71 ($\chi^2 \geq 0$). Therefore, the hypothesis H1, which postulates that "Yes, there is a variation in the demand for biotrade derived from native biodiversity; before the variation of the environmental conscience"

1.2. Increase in Peruvian export belong to Bio Trade

The native biodiversity trade is one of the businesses that has been developing a lot of Peruvian exports, said the general director of Foreign Trade Development Policies of the Ministry of Foreign Trade and Tourism (Mincetur), Luis Mesías Changa. (MINCETUR, 2018)

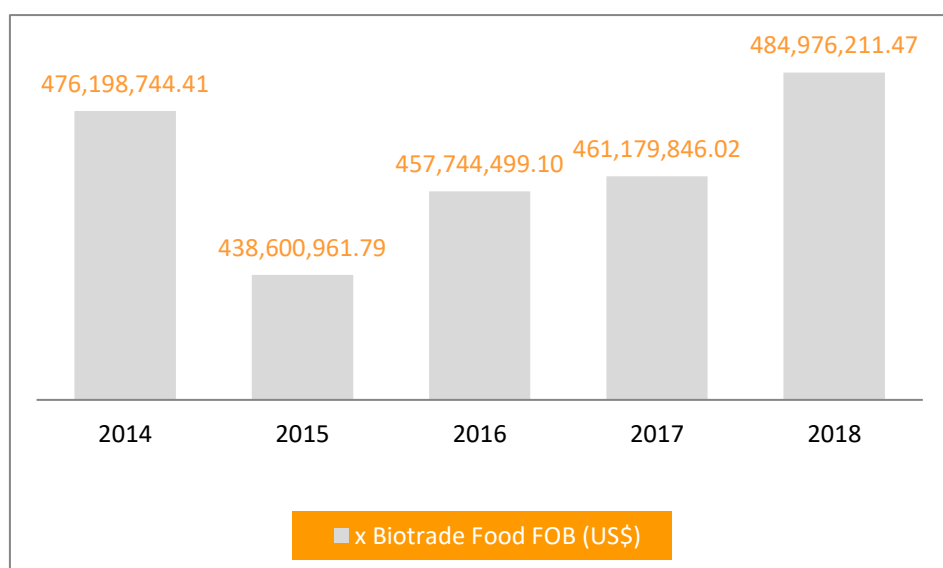


Figure 8. Exports of native products of bio trade in Peru value FOB US\$: 2014-2018, own source 2019

Peruvian exports of this item went from US \$ 423,395,000 in 2014 to US \$ 484,976,211 in 2018 (Figure 8). In 2015, a decrease of 9% was observed in the prices of bio trade exports; however, this does not show a decrease in the volume of exports. According to the interview with Caridad Maldonado, the fall from 478 million to 438 million in 2014 and 2015 was due to the return of quinoa containers by the USA, who did some inspection tests where the product did not pass. However, this happened due to the appearance of new permits. Then, with new markets, destinations or entrepreneurs, they begin to diversify their offer and exports increase again. Exports of native foods of bio trade increased 5% in 2018 comparison with 2017, and 6% in the last three years.

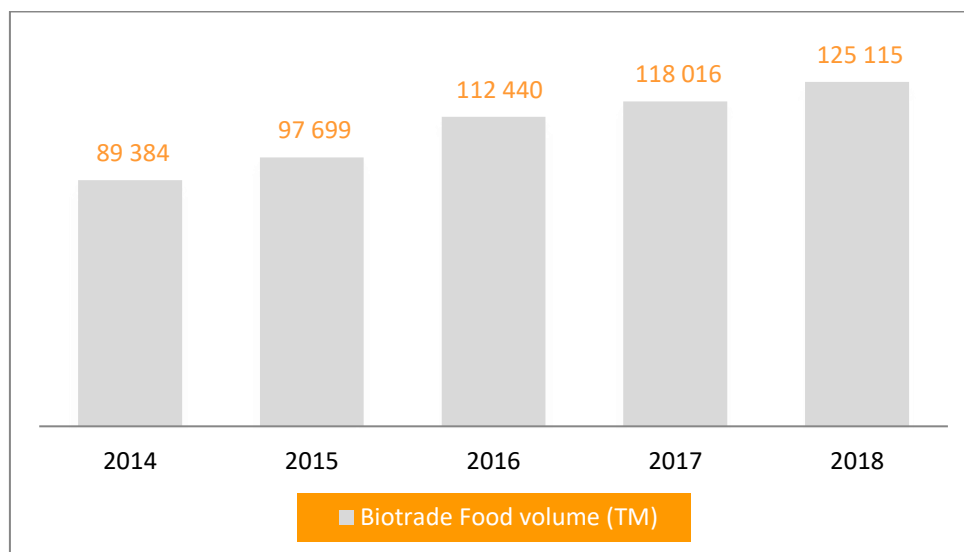


Figure 9. Exports of native products of bio trade in Peru volume tons: 2014-2018, own source 2019

There was an increase in volume in exports of bio trade of native products by 5% in 2018, and 40% during the last five years (Figure 9).

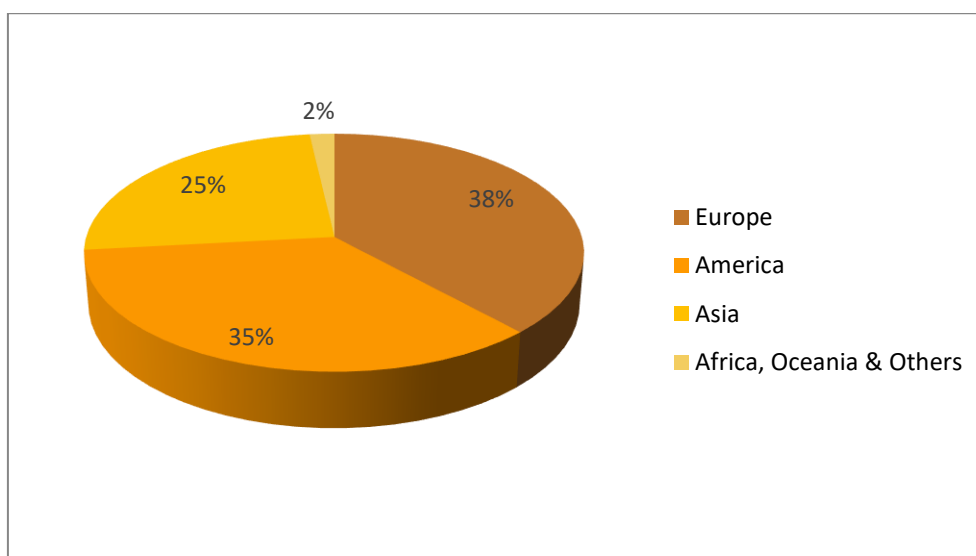


Figure 10. Main Destination of Peruvian Bio Trade, own source 2019

The main destinations of products of Peruvian biodiversity abroad are America with 38%, and the EU with 35% and Asia with 25% vs 19% in 2017 and others with a 2% share.(Figure 8)

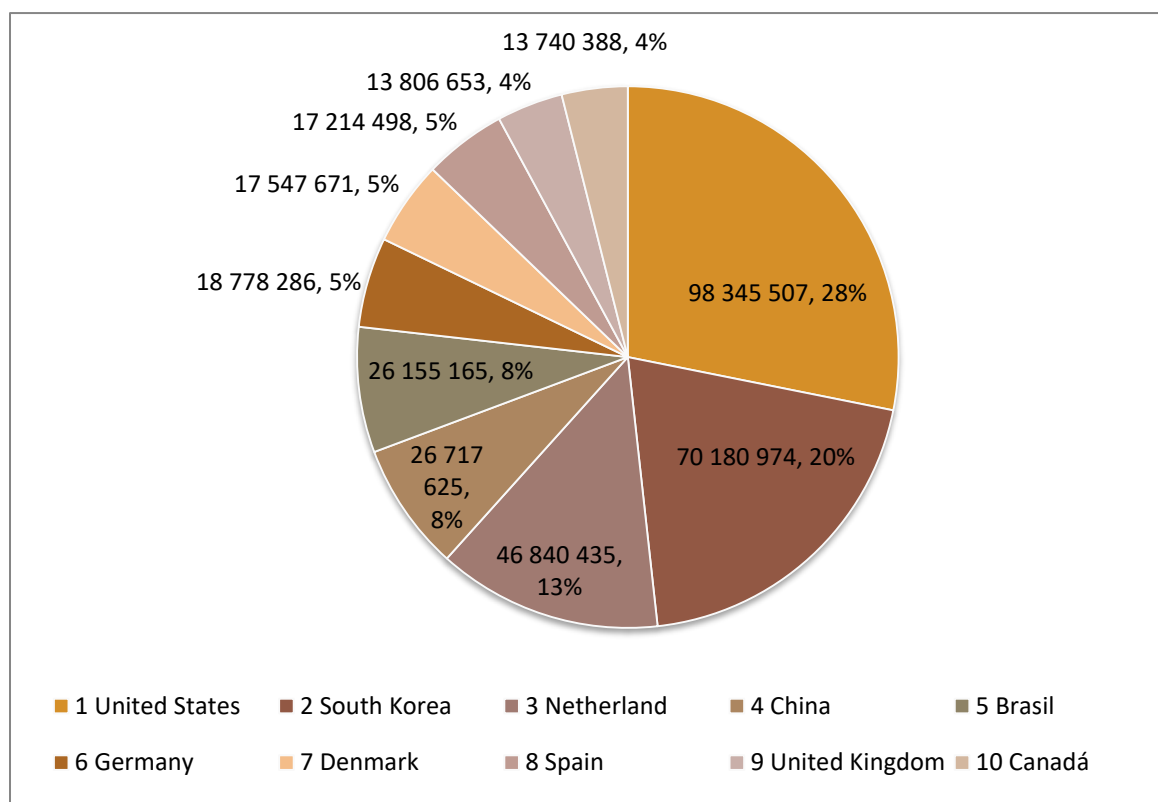


Figure 11. Native Biodiversity Exports 2014-2018 FOB millions USD per Countries, Adapted from SIICEX 2018 and PROM PERU 2019

In the list of destination markets, the United States head, which has been maintained for the last five years, with a 28% following by South Korea, the Netherland and China with a 20%, 13% and 8% respectively, according SIICEX.statistics (Figure 9).

The variation of growth in exports of the native fruits belongs to bio trade with greater importance per value US\$ FOB of the period 2014 to 2018 have been in the Nuts of Brazil in 54%, Sacha Inchi in 78%, Aguaymanto in 65%, Tuna in 99% and Molle in 98%. (Figure 10)

The higher variation of growth in exports of the native fruits of biotrade with greater importance per volume from 2014 to 2018 have been in the Maracuya in 53%, Curcuma in 52%, Sacha Inchi in 75%, Aguaymanto in 69% and Camu camu in 45 %. (Figure 11)

Caridad Maldonado, Specialist of the Sustainable Trade Department from PROM PERU, indicates that in recent years, new fruits of our biodiversity have been developed for exports with good results such as the Maiz Gigante del Cusco, Hercampure, Aguaje, Cocona, Copaiba. etc. (Maldonado, 2019)

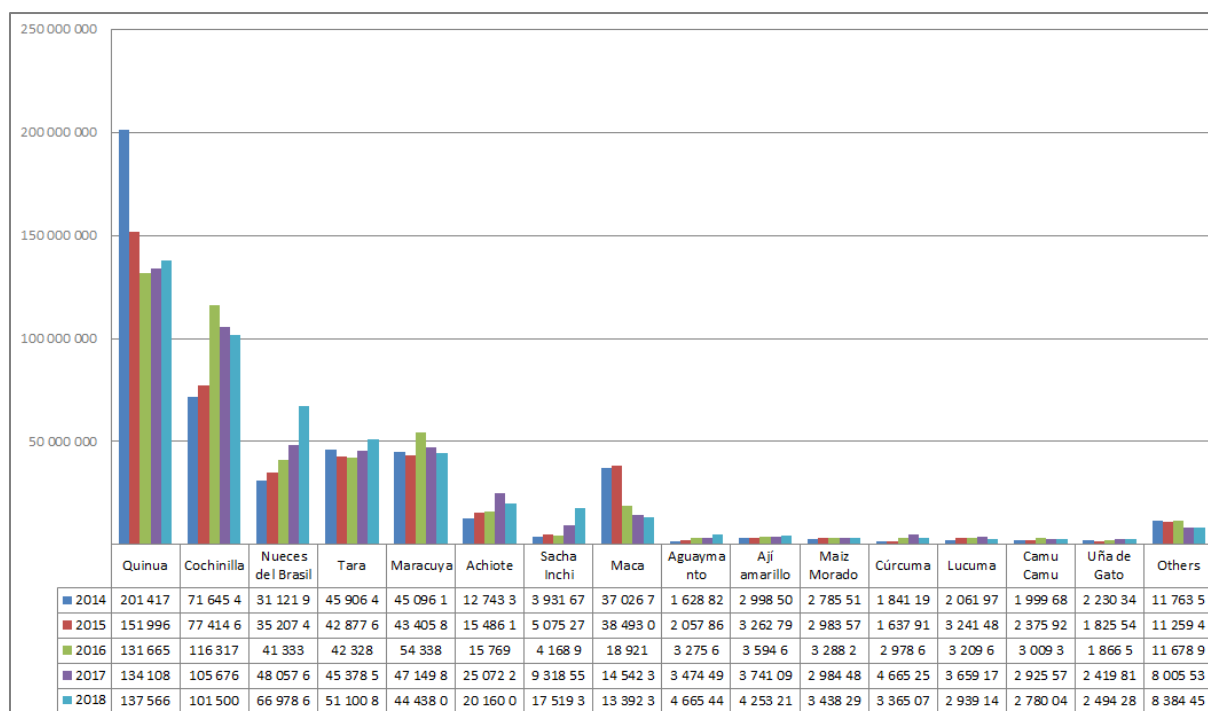


Figure 12. Evolution of Main Products of Native Biodiversity Export 2014 - 2018 US \$million FOB, Adapted from PROM PERU 2019

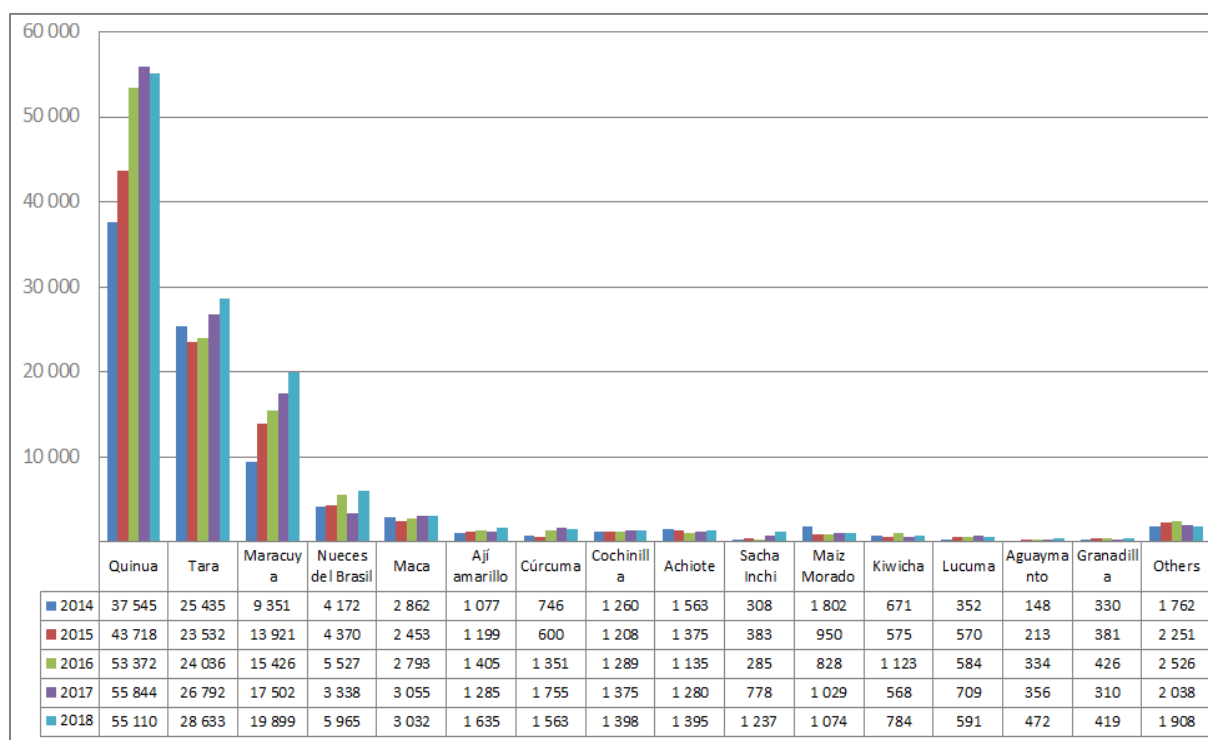


Figure 13. Evolution of Main Products of Native Biodiversity Export 2014 - 2018 volume tons, Adapted from PROM PERU 2019

1.3. Consume per-capita

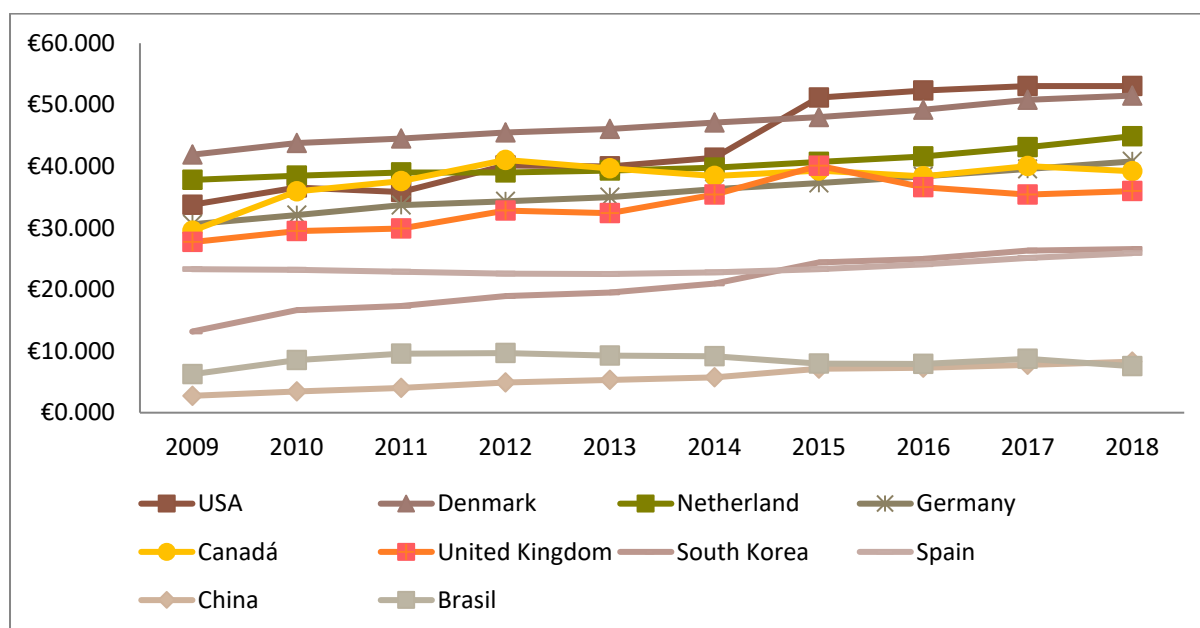


Figure 14. Graph of Income per-capita of the main international markets of the agricultural sector Bio trade 2009-2018. Own elaboration based on World Bank Statistics 2019

Graphic 12 represents the evolution of the per capita income of the 10 major importers of the agro-exportable supply belonging to the bio trade in Peru. The USA is the country with the highest per capita income in the years of the study period, which ranks first in importing Bio trade products in Peru. China, Brazil and Spain are the countries with the lowest per capita income; however, China and Brazil are the fourth and fifth country importer of Peru's bioproducts respectively, both having an 8% share. It is important to highlight that commercial agreements are maintained with all these main commercial partners in the agricultural sector.

2. Sub question two: Is there availability of resources for the production of native food of sustainable extraction?

2.1. Biodiversity Peruvian- Natural Capital of Peru

Peru has an immense wealth throughout the country and with geographical areas with appropriate characteristics in biodiversity, confluence of species (natural capital) and wealth of collective knowledge (cultural capital)

- It is one of the 17 megadiverse countries on the planet.

-
- It is one of the 12 countries richest in biodiversity with 84 of the 117 life zones in the world.
-
- It is the 1st country in fish with about 2000 species of marine and continental waters, (10% of the total world), 2nd in birds (1736 species), 3rd in amphibians (332 species), 3rd in mammals (460 species) and 5th in reptiles (365 species).
-
- It is the 1st country in varieties of potatoes, corn, peppers, Andean grains, tubers and roots. In addition, it has a high genetic diversity and is one of the world centers of origin of agriculture and livestock.
-
- It is the 4th country in forest area, with 70 million hectares of forests.
-
- It is the 5th country in the world in number of species with at least 6288 of which 5528 belong to the flora and 760 to fauna (30% are endemic species).
-
- It is one of the main countries in terms of the number of floristic species and glacial wealth.
-
- Its coasts are bathed by one of the most productive marine currents in the world.
-
- Its Amazonian, Andean and coastal forests have a high forest potential.
-
- Agricultural biodiversity that farmers have developed over 10,000 years.
-
- Native populations that play a fundamental role in the conservation and sustainable use of the biological diversity of our country.
-
- Millenary knowledge about the use of native flora and fauna in harmony with the environment, which survives through the native and peasant communities.
-
- Be the 1st country in the world in number of plant species with known and used properties (4400 species) that are used for a number of purposes.
-
- Be the 1st country in the world in native domesticated species.
-
- High cultural and human diversity, the country has 14 linguistic families and unless 44 different ethnic groups, of which 42 are in the Amazon.
-

Source: CONAM, PROMPERU, UNCTAD 2004



Figure 15. Fruit Native Species By Antonio Brack, Adapted from Diccionario de Frutas y Frutos del Perú, 2012

2.1.1.The Fruits of Peru

Peru is one of the countries with a very high diversity of species of living beings, among which the plants stand out, which together amount to about 25,000. Of all the plants in Peru, some 5,000 are of known uses as food, medicine, condimenticias, dyeing, tanning, timber, ornamental, fertilizer and many others.

A prominent place has the plants that produce edible fruits, as well as fruits, vegetables and nuts, which reach a total of 623 species, of which 553 are native and 70 introduced. This high number position Peru as the country with the greatest diversity of fruit trees in the world.

Of this total domesticated 120 species (66 introduced and 54 native); they exist as wild and 149 species are also cultivated; and 352 species are known and used only as wild.

The Amazon is the region with the largest variety of fruit trees with 507 exclusive species, while the Coast only has 20 species and the Sierra with 44. 35 species are common to the Coast and to the Amazon; common to the Coast and the Sierra 16 species; common to the Sierra and Amazonia 25 species; and some 37 species are found in the three regions. (Brack, Diccionario de Frutas y Frutos del Peru, 2012)

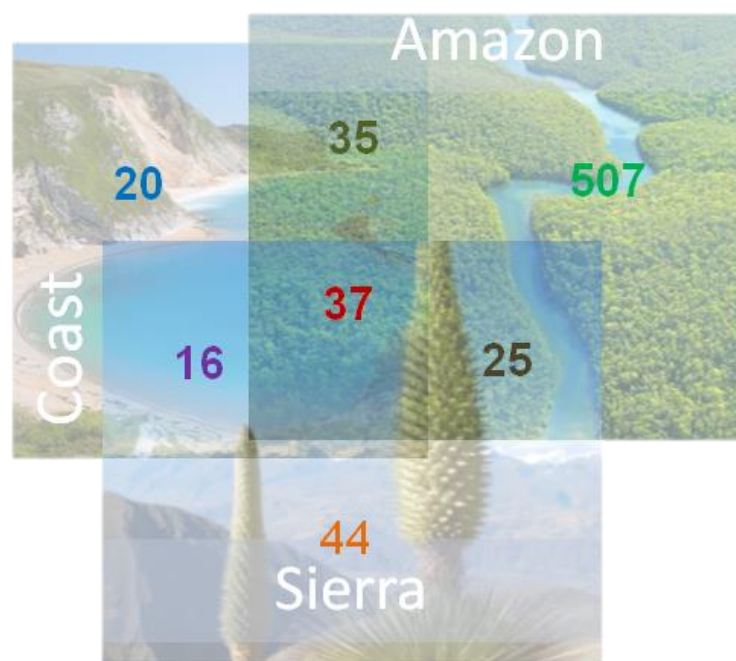


Figure 16. Regions of Fruit Native Species By Antonio Brack,
Adapted from Diccionario de Frutas y Frutos del Perú, 2012

The research "Current situation of the ethnobotanical research on the palms of Peru" where the biodiversity of the peruvian amazon is studied with a focus on palm three, concluding with a list of the species, its name in the community and the use of the input, without needing annihilate the plant to obtain the input, with the characteristic of industrial development. (Albán, J., Millán, B., & Kahn, F., 2008)

PRODUCTO	Nombre científico	PRODUCTO	Nombre científico
1 Achiote	<i>Bixa orellana</i>	19 Kañihua	<i>Chenopodium pallidicaule</i>
2 Aguaymanto	<i>Physalis peruviana</i>	20 Lúcumá	<i>Pouteria obovata</i>
3 Algarrobo	<i>Prosopis pallida</i>	21 Maca	<i>Lepidium meyenii</i> Walp
4 Barbasco	<i>Lochocarpus nicou</i>	22 Maíz gigante	<i>Zea mays</i>
5 Caigua	<i>Cyclanthera pedata</i>	23 Maíz morado	<i>Zea mays</i> L.
6 Camu Camu	<i>Myrciaria dubia</i>	24 Molle	<i>Schinus molle</i>
7 Chancapiedra	<i>Phyllanthus niruri</i>	25 Muña	<i>Minthostachys mollis</i>
8 Castaña	<i>Bertholletia excelsa</i>	26 Pasuchaca	<i>Geranium dielsianum</i> Knuth
9 Chirimoya	<i>Annona cherimolia</i>	27 Quinua	<i>Chenopodium quinoa</i>
10 Chuchuhuasi	<i>Maytenus macrocarpa</i>	28 Ratania	<i>Krameria lappacea</i>
11 Cochinilla	<i>Dactylopius coccus</i>	29 Sacha Inchi	<i>Plukenetia volubilis</i>
12 Cocona	<i>Solanum sessiliflorum</i>	30 Sangre de Grado	<i>Croton dracanoides</i>
13 Copaiba	<i>Copaifera paupera</i>	31 Sauco	<i>Sambucus peruviana</i>
14 Granadilla	<i>Passiflora ligularis</i>	32 Tara	<i>Caesalpinia spinosa</i>
15 Guanábana	<i>Annona muricata</i>	33 Tumbo	<i>Passiflora mollissima</i> H.B.K
16 Hercampure	<i>Gentianella alborosea</i>	34 Tuna	<i>Opuntia ficus-indica</i>
17 Huito	<i>Genipa americana</i>	35 Uña de Gato	<i>Uncaria tomentosa</i>
18 Kiwicha	<i>Amaranthus caudatus</i>	36 Yacón	<i>Smallanthus sonchifolius</i>

Table 3. Exportable Offer of Bio Trade Products in Peru. Experiencia del Biocomercio en el Perú: Estrategia Nacional de Biocomercio y su Plan de Acción al 2025. Reprinted from UNCTAD 2016

Peru is one of the first countries where the concept of bio trade is widely recognized. In Peru, the “National BioTrade Strategy” document and its “2025 Action Plan” formulated by the Ministry of Foreign Trade and Tourism offers the list of Peru's current offer of bio trade products. (Table 3)

The administrative system of INDECOPI grants the recognition and institutional use of the concept and principles of the bio trade in the management of biological resources in Peru.

Peru offers and promotes products that are called "bio trade products" separated from products from biodiversity that are not included in this sustainable business model. Peru recognizes that the production of products from biodiversity generates environmental and social costs, and handles them with a corresponding increase in their prices in the market as has been pointed out by Vanessa Ingar (Vanessa Ingar Elliott, 2019)

As we can see in the map below, the areas richest in biodiversity resources are located where poverty reaches extreme levels. Bio trade then emerges as a development alternative for these less favored areas. The Bio trade model is the ideal to favor these populations, since they would be integrated into the value chains formed by production, processing, marketing and export networks of inputs from their regions.



Figure 17. Current distribution of BioTrade products, Reprinted from Biocomercio Peru by PROM PERU

2.2. Threats to the conservation of diversity

In Peru, protected areas are grouped under the denomination Natural Areas Protected by the State or simply Natural Protected Areas (ANP). These form as a whole the "National System of Natural Areas Protected by the State" (SINANPE) under the jurisdiction of the Ministry of Agriculture through the

National Institute of Natural Resources (INRENA). In October 2007 it is made up of 62 protected natural areas (14.80% of the national territory, more than 19 million hectares). (Panduro, 2019)

Recently, President Martín Vizcarra chose the reserve of Pacaya Samiria to launch the plan "Natural Heritage of Peru", a fund that will allocate 140 million dollars to protect 38 natural areas that cover 17 million hectares of the country. In this reserve there are 30,810 hectares of aguajales, popularly called "forests of life", the marshy areas where the aguajes grow. For the community "20 de Enero", made up of 90 families, the reserve is their livelihood thanks to the commercialization of aguaje. Wiler Tuesta, president of the Association of Producers and Processors of Aguaje Oil declared that the felling of the tree is not done anymore, now the community keeps it "In the community they have changed the technique for harvesting the fruit of the palm tree with a system consisting of two strings known as strobos. The harvest of aguaje in this reserve is marketed for the preparation of juices, soaps and medicinal oils, used against hair loss and stress. (Andina Agencia Peruana de Noticias, 2019)

Agriculture in Peru



Table 4. SWOT analysis of the agro-export sector in Peru, 2015 Reprinted from El sistema de agronegocios en el Perú: De la agricultura familiar al negocio agroalimentario source MINAGRI y MINCETUR, by Castro, H 2016

In South America, Peru ranks first among the countries with the highest agro-export growth with average annual rates of 15%. However, not everything has turned into benefits for the population. The last National Agricultural Census indicates that 60% of agricultural exports are focused on the coastal region, although the largest number (64%) of agricultural units is located in the highlands; this concentration would be mainly due to irrigation projects and road infrastructure. There are still issues to be resolved, such as access to financing and the use of agrochemicals and certified inputs (Castro, H. L., Goicochea, C. U., & Flores, M. F., 2018)

Mario Pinedo, Researcher of the Research Institute of the Peruvian Amazon-IIAP, underlined that in Peru it is possible to sustain an organic agriculture taking ancestral techniques and technologies that are used until our days. To increase the quality and yield of crops in the plots of small producers, it is necessary to look for low-cost, easy-to-apply organic fertilization alternatives. In this sense, the study determined the effect of biofertilizers on the agronomic characteristics and yield of the camu-camu fruit. In this way, biofertilizers made from cattle manure and poultry manure significantly improved the yield, size and weight of fruit in camu-camu plants (Panduro, 2019). Within the validation of the export product for bio trade it should be noted that the products cannot be modified in any way genetically. So, the Nagoya protocol is timely at this point, said Caridad Maldonado. Accordingly, scientific techniques developments always are important to the conservation of the native species and its properties. (Maldonado, 2019)

The conservation and protection of biodiversity resources is supported by the Law on Protection of Access to Peruvian Biodiversity and the Collective Knowledge of Indigenous Peoples law N° 28216 established in 2004 and with the same creates the commission responsible for compliance.

The **illegal trade** of hardwoods from tropical forests is also considered a significant factor affecting biodiversity. Bio trade was aggravated by the illegal trade of genetic material or biopiracy of Andean and Amazonian species to developed countries, said Caridad Maldonado, a biotrade specialist at PROM PERU. Currently there are 67 cases of biopiracy, which are linked to the ancestral knowledge of the country's indigenous peoples and their genetic resources, 45 of them were resolved in favour of the Peruvian State. Another 18 remaining cases are still in the process of being resolved.

Of the 67 patents analyzed, those related to grade blood (26), maca (24), sachu inchi (8), tara (3), camu camu (2), pasuchaca (2) stand out, the yacón (1), among others. The CNB mainly identified these alerts in countries such as China (11), United States (14), Japan (10), South Korea (4), Uruguay (4), Australia (3), Argentina (3), Europe (3), France (2), Canada (2) and the Philippines (2).

3. Sub question three: Does the offer of native fruit comply with the three pillars of bio trade?

3.1. Economic Development of Bio Trade Companies

In order to validate the fulfillment of the **economic development** coming from the exportable supply of native food of the Peruvian diversity belonging to bio trade, four prioritization criteria are obtained that determine the business model (Development Bank of Latin America, 2015).

- a. Level of exports in FOB US \$ value.
- b. Export trends.
- c. Export potential: exportable offer, bidding companies, product development.
- d. International Cooperation Projects in implementation.

The first criterion, export level, has already been validated in section 1.2. Growth of Peruvian exports from the bio trade on which it is based.

According to UNCTAD's "20 years of Bio Trade Magazine", the trend of the bio trade around the world is implementing a variety of sectors included in the table below. (UNCTAD, 2017)

Sector	Type of Product
Personal care	Essential oils, natural dyes, soaps, cream and butters, cosmetics, etc.
Pharmaceutical (phytopharma)	Extracts, capsules and infusions from medicinal plants and algae, etc.
Food	Fruits pulps, juices, jams, biscuits and sauces, spices, nuts, tubers, snacks, food supplements, meat from caiman and fish, etc.
Fashion	Skin and belts, purses from Caiman yacare, etc.
Ornamental flora and fauna	Heliconias, orchids, butterflies, etc.
Handicrafts	Jewellery, decorative objects based on native species, garments, etc.
Textiles and natural fibres	Furniture and decorative objects based on natural fibres, purses, shoes, etc.
Sustainable tourism	Ecotourism, nature-based tourism, community-based tourism, etc.
Forestry-based carbon credit activities	Reducing Emissions from Deforestation and Forest Degradation, conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+), greenhouse gas (GHG) emissions mitigation strategies for specific value chains, etc.

Table 5. Source: UNCTAD, 20 years of BioTrade Magazine, Trade and Biodiversity Conservation – 2016

Within the list of new sectors, there is a cosmetic trend that is growing in the organic trade sector around the world. This growing industry reached US \$ 532.43 billion in 2015 and its outlook for growth is US \$ 605.61 billion.

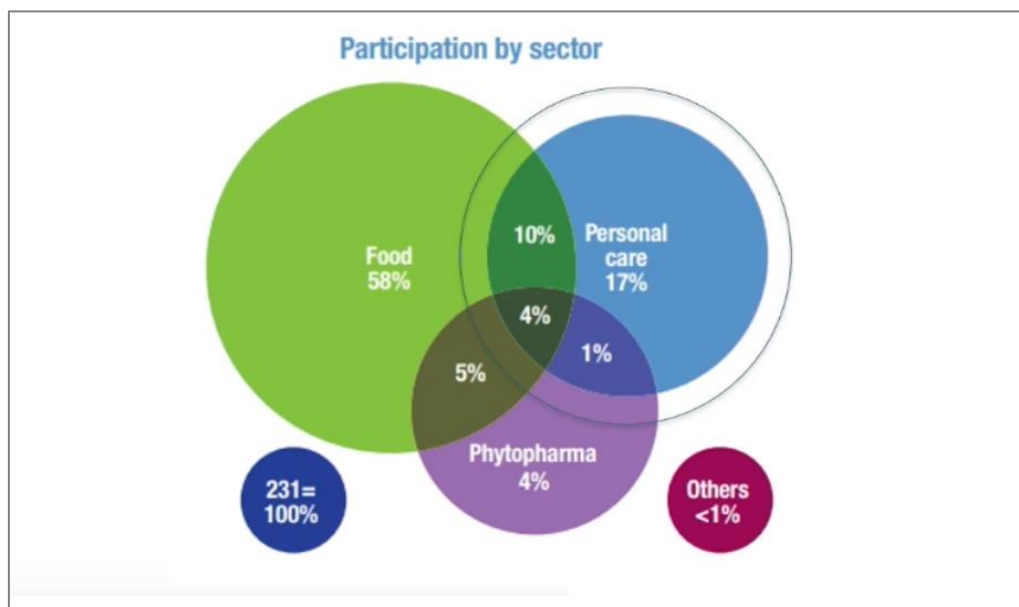


Figure 18. Global Cosmetic Products Market – Analysis of Growth, Trends and Forecast 2018-2023, Adapted from Trade and Biodiversity Conservation by UNCTAD

Caridad Maldonado said in the interview that the segmentation of the Biotrade Market in Europe is basically contained in these three segments: food, health and cosmetics and there are intersections between them. According to the sales criteria in the biotrade, a **new line** of Peruvian products has been developed to satisfy market trends. (Maldonado, 2019)

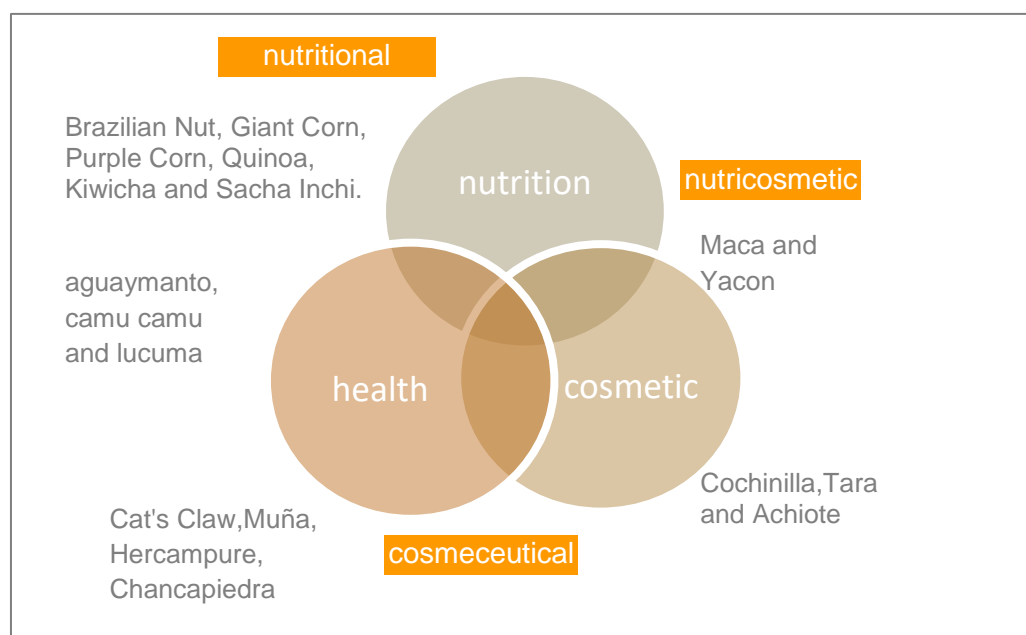


Figure 19. Use of Add Value of Bio product in Peru. Own elaboration.

Peru has native fruits that meet these current trends. Peruvian citric fruits, as camu camu, have advantages of new trend due to the high nutraceutical value; it is the one that fulfills the nutritional value due to its high content of vitamin C and a strengthened immune system for the consumer. (Panduro, 2019).

According the Direction of Biology of MINAM, Vanesa Ingar declared that Peruvian biotrade companies had **export potential** of native food belong to bio trade.

The **number of new companies** increased from 600 to more than 700 companies linked to this category during the last five years, showing a growth of 17%. Despite the reduction of agro export companies of traditional business model in Peru, those in this sector continued to grow.

Product **diversification** was also increased, since Peruvian recently exported 20 products of its biodiversity fruits and at 2018 were 69. In addition, every year new products are added in new presentations. The **new market segments** for bio trade products are: pet food, cleaning and personal care products, food supplements, baby products, sports supplements, products for the aging population. Among the main products made by the bio trade companies are quinoa, cocoa and sacha inchi. These last foods have been the ones with more time in the business. (Figure 19).

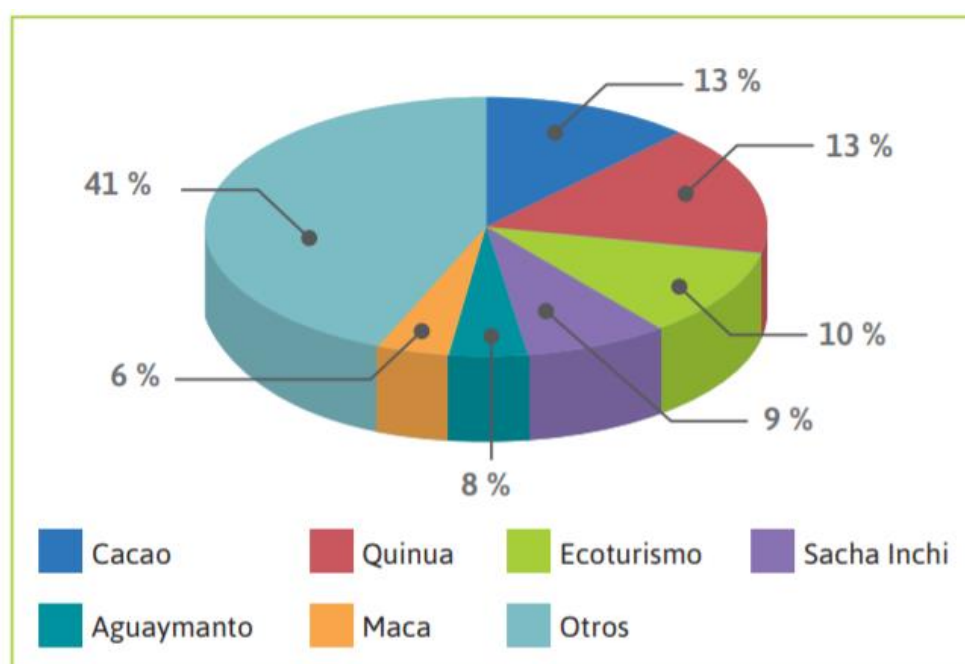


Figure 20. Main products worked by bio trade companies, Based on MINAM 2015

According to the information compiled in PROMPERU and MINAM, some examples of innovations in Peruvian companies have been selected some value added product from the biodiversity to cover the economic development of bio trade in the country:

Sub-Sector	Innovation Products	Company
Preparing products	Instant soup as Quinoa pop	Wiracocha (Ayacucho)
Preparing products	Quinoa Chips, bars, cookies	Qfood
Essential oil and retinas	aceite copaiba	Inkanatura
Vegetable oils	vegetable oil of castana	Candela
Essential plants capsules, health care	blood grade or chanca piedra	Peruvian Natural
Photoprotector	Aguaymanto (golden berry)	USIL
Shoes	Shiringa	Evea

Table 6. Peruvian Biotrade Products with added value. Source by Caridad Maldonado PROM PERU

International Agreements and Programs on Bio Trade

Within international cooperation projects that aim to promote BioTrade as a sustainable business model that ensures the conservation of native biodiversity are listed below:

- **Programa de Facilitación de Biocomercio (BTFP)**
UNCTAD, 2003 with national coordination through PROMPERU facilitation of sustainable trade and investment in products and services derived from biodiversity.
- **Proyecto Perú Biodiverso (PBD)**
Swiss Cooperation - SECO and German Cooperation - GIZ with national counterpart. It facilitated the access of Peruvian companies of bio trade to international and national markets, also supported to strengthen the competitiveness of producer organizations and companies involved.
- **Proyecto Capacity Building on Biotrade (CBBT)**
It gave strengthened capacities in negotiation issues and policies relevant to BioTrade and promoting the exchange of experiences and cooperation in international forums between Namibia, Nepal and Peru.
- **Proyecto Facilitación de financiamiento para negocios de biodiversidad y apoyo al desarrollo de actividades del mercado en la Región Andina (GEF/CAF) Bio comercio Andino (BCA)**
Contribute to the conservation and sustainable use of the biodiversity of the Andean region at the local, national and regional levels. Technical work by CAF and PROMPERÚ and the Ministry of Environment for four years
- **Proyecto Peru BioInnova**
Swiss Cooperation-SECO, the German Cooperation (implemented by GIZ), Mincetur, PROMPERÚ and Minam, in coordination with the Regional Government of San Martín, Improves the environment for innovation and competitiveness in selected BioTrade value chains.

Likewise, there are international cooperation projects that MINAM implements, **not directly** under the **BioTrade** scheme, promote the sustainable use of native biodiversity and its commercial articulation for the sustained development of the areas where they are produced.

- BioCAN Program (Kingdom of Finland)
- Project for the Strategic Development of Natural Products - PRODERN I (Belgian Technical Cooperation)
- Sustainable Land Management - MST (Global Fund for the Environment and the United Nations)
- Benefits of ecosystem goods and services reduce poverty in high biodiversity areas of the Peruvian Andean Amazon - ASBYSE (European Community)
- EuroEcoTrade budget support program (European Community)

Sustainable Trade Programs

	Training in Bio Trade and Value Chains Virtual classroom of Bio Trade Evaluation in Principles and Criteria Incorporation of the Peru Bio Trade Seal
	Organic Certification Management Improvement of Traceability Systems in Organic Products Good Practices in the Management of Certifications
	Good Fair Trade Textile / Food Practices
	Eco-efficiency - Good Practices for Profitable Environmental Management Carbon Footprint Measurements Carbon Footprint Workshops and product life cycle
	Women Leader Program She Exports CSR (Socially Responsible Leaders)

3.2. Environmental and Social Development of Bio Trade Companies

This section is dedicated to analyzing social and environmental development in companies engaged in bio trade because sustainability implies a stable business ecosystem along with government support. The results of the evaluation developed by MINAM is explained in an analysis of 9 commercial initiatives that have been supported by Bio Trade projects during the last seven years in Peru.

3.2.1. Reference of the profile of companies that have participated in Bio trade projects

The Bio trade projects identified several types of companies that are carrying out their commercial activities with a focus on sustainability, then graphically shows data on the main characteristics of the companies of bio trade in Peru. (Figure 21,22,23,24)

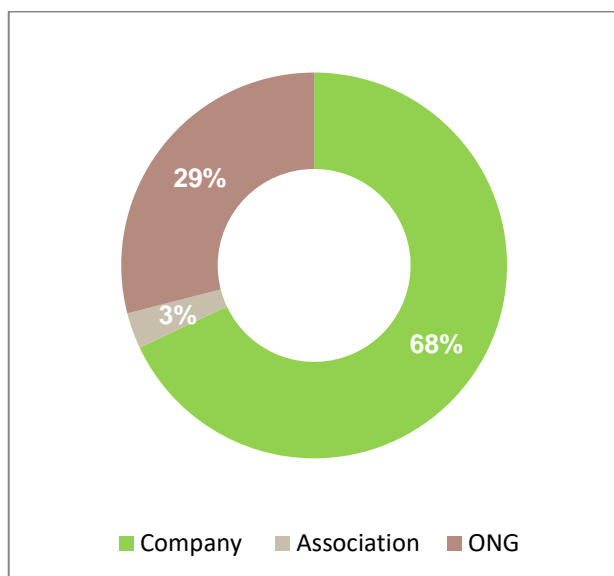


Figure 21. Type of initiatives

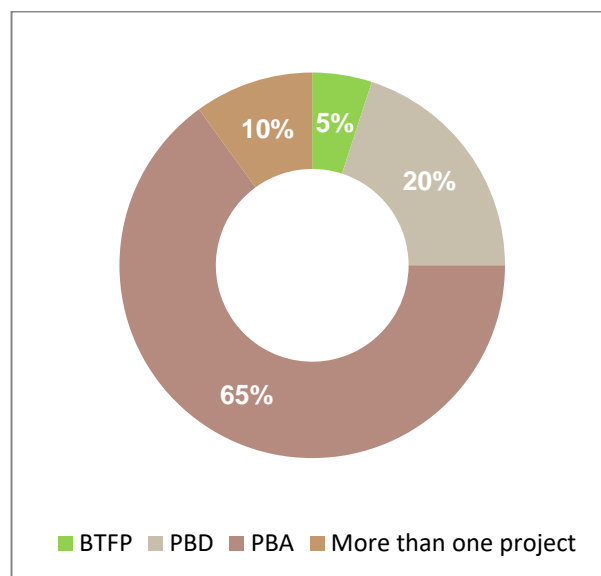


Figure 22. Percentage of participating companies

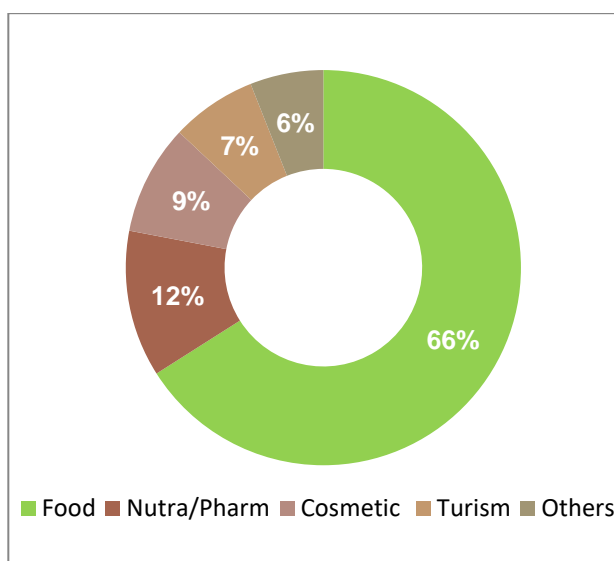


Figure 23. Economic sectors bio trade companies

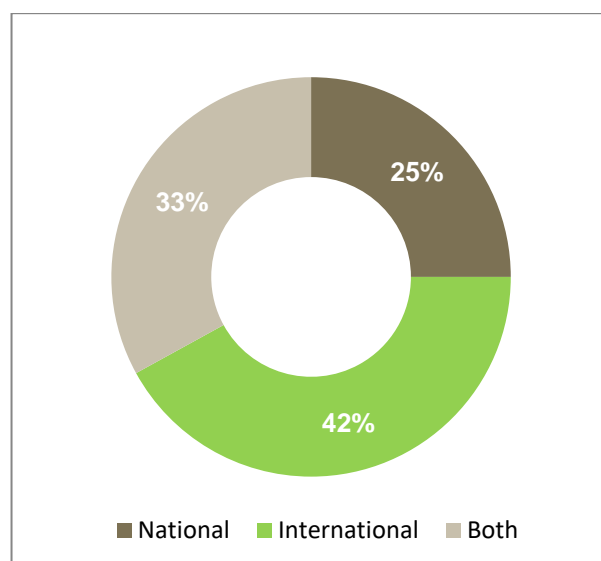


Figure 24. Companies by market segment

The evaluation was carried out to measure the impact of organic trade in relation to the conservation and sustainable use of biodiversity. Two principles of the bio trade that to 2015, there was no certification that accredits: conservation of biodiversity and sustainable use of biodiversity

Fifty percent of the analyzed bio trade companies have certifications, while the others have implemented sustainable actions such as agroforestry, use of organic fertilizers, crop rotation, among others. The

companies that do not have any certification indicated that it is not easy for them to access a certification because of the demands and costs that this demands, in addition to being very commercially small.

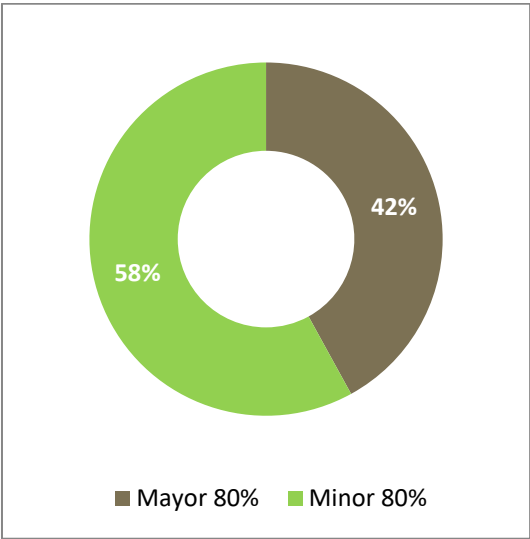


Figure 25. Satisfactory compliance of Conservation of Biodiversity, based on MINAM, 2015

According to the evaluations verified in the biotrade projects and compiled by MINAM, they indicated that 46% of the companies comply with the **Conservation of Biodiversity** with compliance greater than 50%, which means that the process of supplying the raw material keeps harmony with the ecosystem. Within the evaluation of the companies, knowledge and awareness of the importance of maintaining the health of the ecosystem for the constant supply of the raw material was considered.

Of this universe of companies, 42% of them have satisfactory compliance that exceeds, and even reach 100% compliance (Figure 25). It should be noted that the ecotourism companies in the Manu National Park and the Tambopata National Reserve were the ones that reached this maximum score, carry out their activities in buffer zones or areas allowed for use within protected natural areas (PNA).

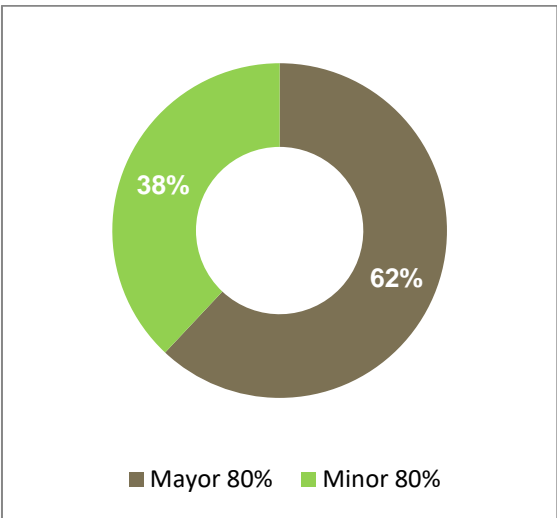


Figure 26. Satisfactory compliance of Sustainable Use of Biodiversity, based on MINAM, 2015

In terms of compliance with the **Sustainable Use of Biodiversity**, 76% of the companies obtained a compliance percentage higher than 50%, this means that most of the companies have implemented and invested or have been associated with actors, most of them producers or associations of producers, who invest in sustainable actions in the provisioning activities. Of this universe, 62% reported satisfactory fulfillments, that is, they exceed 80% (Figure 26). Companies that comply with 100% of this principle are also registered, some within buffer zones of ANP and others in areas that have no link with ANP as for example in systems of cultivation of native fruit trees and achiote.

The companies that achieve a higher percentage of compliance are those that have taken the decision to get involved in the production systems, either because they have direct actions with the producers or because they are associated with other entities such as NGOs, universities, research centers and those involved in field activities.

3.2.2. Certification and labelling

There is no specific certification and labeling system for Bio Trade. However, international organizations are providing certifications for practices and products that have positive impacts on biodiversity. Some of them are:

- Fairtrade Labeling Organizations International (FLO)
- Forest Stewardship Council (FSC)
- International Federation of Organic Agriculture Movements (IFOAM)
- Fair Wild (FW)
- Feria de la Vida (FL)
- Rainforest Alliance Certification (RAS)

All the ecological labeling and certification programs mentioned above are voluntary and represent an important incentive for companies and producers that follow sustainable practices.

Up to 90 percent of the Peruvian companies of bio trade have Fair Trade and Organic Certifications in 2012. The main certification agencies in Peru are the Control Union Certification (CUC), the Institute of Marketecology (IMO), Biolatina and OCIA International. These agencies certify products for the main destinations of the BioTrade market, such as the United States, the European Union and Japan.

Although there is no specific certification system for BioTrade, the Union for Ethical BioTrade (UETB) has introduced and implemented a verification process, a non-profit association created in partnership with the CBD Secretariat, UNCTAD and other interested parties that promote Biotrade (United Nations Environment Programme, 2012)

The verification of the principles and criteria of the biotrade to the companies that postulate are being executed by PROMPERU specialists. These companies must obtain compliance equal to or greater than 75% to form part of companies that are part of the biotrade and obtain the Bio Trade Peru logo. This obtaining of the logo is renewable every two years. Currently there are 32 companies that have

obtained the certification and allow them to be promoted and empowered, through PROM PERU, to international platforms such as BioFach, which is annually carried out in Germany.

3.2.3. Governance and environment favorable to Biocommerce

The **National Program of Biocommerce Peru (PNBP)**, has implemented an organizational model, based on an Institutional Network System made up of public and private organizations related to the administration and research of biodiversity resources, as well as promotion and promotion institutions of productive and business activities based on said resources. This scheme responds to the need to articulate the large number of existing institutions in the country that had been carrying out actions related to the sustainable use of biodiversity, but without coordination, generating duplicity, gaps and inefficiencies in the actions of promotion and promotion.

Currently, the **National Commission for the Promotion of Bio Trade (CNPB)** is made up of the following institutions:

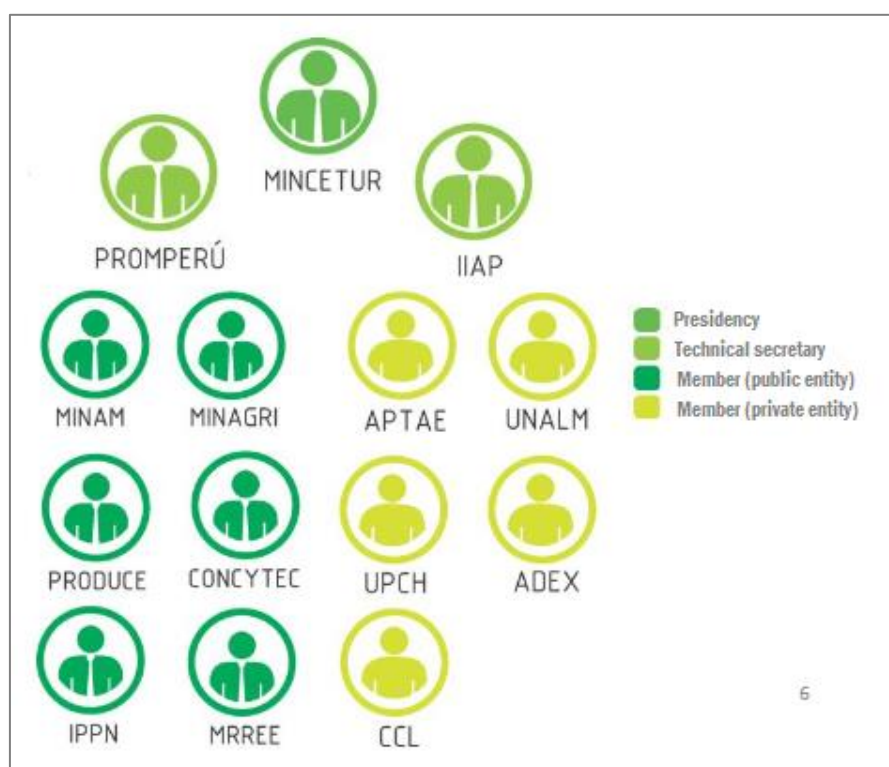


Figure 27. The National Program of Promotion of BioTrade (CNPB)

Collaboration and mainstreaming biodiversity into different economic actors, from trade, environment, agriculture, research, universities and the private sector, was shown by the Peruvian experience from its National Commission for bio trade Promotion and formulation of the National Bio Trade Strategy (Figure 27). Under bio trade, the country addressed trade barriers for selected biodiversity-based products and mobilized efforts from different stakeholders to support trade-friendly measures focused on biodiversity conservation.

FIGURE 1. BioTrade as a tool to mainstream biodiversity into the economic sectors



Source: Extract from Vanessa Ingar Elliott presentation at the IV BioTrade Congress, 2016.

Figure 28. Bio Trade as a tool to mainstream biodiversity into the economic sectorsd. Reprinted from Trade and Biodiversity Conservation, Report of the IV BioTrade Congress.by UNCTAD,217

Efforts are also focused on developing quality standards, product and process information and specifications, and traceability systems that support the sustainable use and trade of selected species for economic value and volume. This has facilitated market access of native species, including the novel food approval as *sacha inchi* to enter the EU market with the support of biotrade companies, government advocacy, academia and international cooperation. Finally, Peru has also defined harmonized system (HS) codes that document the trading of biodiversity prioritized species under BioTrade. (UNCTAD, 2016)

Chapter 4 – Discussion of results

The research aimed to show if the native fruits belonging to the bio trade in Perú can be sustainably exportable. In the same way, it seeks to determine the relationship between each of the dimensions of the variables: sustainable demand, availability of resources and three fundamental pillars of sustainability.

The major limitation of research is that it is limited to mostly European consumers in the related survey, so the results can only be inferred from this continent. It is also necessary to remember that Peru is dedicated to agriculture and commerce of agro-products; for local and international clients.

Sub question one: Is there a growing demand for Peruvian native fruit that belong to bio trade?
Growth of the demand in bio trade

Likert scales with five levels were included in the structure of the questionnaire for greater precision of the results. For the fulfilment of the population sample, digital surveys were included within the communities or groups of biological and biocommerce consumers. For the next investigation, I would schedule the time intervals for better availability of respondents.

Global Bio Trade Opportunity

The bio trade business model demonstrates a sustainable increase of 19% in the last 7 years worldwide and 5% in comparison to unhealthy products. These results open an opportunity for producing countries.

Buyer trends that affect demand

The results prove the dependence between the demand with the tendency of purchase, environmental awareness, and social awareness through the Chi-Square test of independence, however, not towards the price.

Through the survey, the international demand for Biocommerce products has a tendency to continue growing at a rate between 10% -15%. This result differs by 4% from that obtained by information from the Development Bank of Latin America of 19%.

Increase in Peruvian export belong to Bio Trade

There was an increase in the volume of biocommerce exports of native products by 40% over the past five years and an increase in value by 5% over the past three years. Growth maintenance should begin to diversify its offer.

For the extraction of the information, the data updated over the last 5 years was provided by PROM PERU, because there are not HS codes on biocommerce products. The last was not considered before in the investigation.

Consume per-capita

The sustainable economic on the demand countries of Peruvian native products in the bio trade was demonstrated through the Income per-capita of the main international markets of the agricultural sector Bio trade in the period 2009-2018

Sub question two: Is there availability of resources for the production of native food of sustainable extraction?

Biodiversity Peruvian- Natural Capital of Peru

Availability of inputs based on native species of Peruvian Biodiversity. For this, scientific literature on studies of biodiversity in Peru is extracted not only in flora, fauna but ethnic that work in cooperation for the maintenance and availability of resources such as Dr. Antonio Brack and the Peruvian Journal of Biology. The current scope in this investigation is about native products with greater possibility for extraction with industrial potential for sustainable export.

Threats to the conservation of diversity

This part was developed with the collaboration of the Institute of the Peruvian Amazon-IIAP researcher since the native fruits of Peru are located mostly in the Amazon region. The texts and research carried out on agriculture indicate the need for support techniques to maintain standard resources and avoid illegal trade. The research does not contemplate the logistic delivery of the resource in the value chain because it is a business management issue and it blurs the research context.

Sub question three: Does the offer of native fruit comply with the three pillars of bio trade?

Economic Development of Bio Trade Companies

In order to validate the fulfilment of the economic development coming from the exportable supply of native food of the Peruvian diversity belonging to bio trade, four prioritization criteria were analysed. The fulfilment and development of the criteria have been supported by the bibliographic sources collected. Since bio trade is a recent business model, the information was based on economic research and reports from private and government institutions linked to green commerce such as UNCTAD and CAF. Interviews with specialists in bio trade of institutions such as MINAM and PROMPERU, two key members and active participants of the National Commission for the Promotion of Bio Trade (CNPB), contributed to the sources and classified information for the research.

Environmental and Social Development of Bio Trade Companies

In order to verify compliance with social and environmental aspects, the MINAM evaluation was effectuated on the companies, associations, and NGOs that participated in the bio trade projects. The results obtained were satisfactory in conservation and Sustainable Use of Biodiversity which ensures environmental awareness as a source of your income in the Bio Trade.

Furthermore, 90% of bio trade companies obtained Fair Trade certification and organic certification in 2012. However, no more up-to-date by a certification company could be obtained y due to research time and reservation of information.

For the validation of a bio-trade company, the government contributes to the promotion of the bio-trade through the National Program of Biocommerce Peru commission. This commission promotes fair trade and biodiversity conservation. At the same time, bio trade companies have support through programs and projects with government support.

In conclusion, it could be affirmed that there is sufficient evidence to indicate that there is evidence of the sustainable development of exports of native fruits belonging to the bio trade; Therefore, if the quality standard is improved through certifications, the demand can continue to improve. Greater attention should be paid to improving the reliability and responsibility of companies to improve customer satisfaction of bio trade, without neglecting the other dimensions of service quality.

The extraction of the qualitative and quantitative information used for the analysis was not completely used for the realization of the research because it is very extensive. It has been synthesized to cover answering only the objective questions of the research.

Chapter 5 –Conclusions and recommendations

1. Conclusions

Sub question one: Is there a growing demand for Peruvian native fruit that belong to bio trade?

The research concludes that there is a growing demand for Peruvian native food that belongs to bio trade. From the analysis of the results of the survey carried out for the research and the bibliographic sources, it is concluded that the international demand for Bio Trade products has a tendency to continue growing with a greater probability in food products of up to 15%. In the growth of exports of native products of Peruvian biodiversity under the Bio Trade reflects the growing global trend to the acquisition of derivative products through this business model, highlighting the native products with more years in the market that have evolved and innovated, this means added value in the value chain. At the same time of both the survey and the statistics of exports, the export markets are the same markets where consumers obtain an increase in per capita consumption. Likewise of the survey, the exportable supply obeys to the factors of purchase of the products in demand. The statistical results showed that the demanded products must not only comply with quality factors but also with an environmental and social concern above the product price.

Sub question two: Is there availability of resources for the production of native food of sustainable extraction?

The present investigation concludes that **there is availability of inputs based on native species of the Peruvian Biodiversity**, for the creation of products with sustainable added value due to high benefits and multiple use of these species in the industry. This is supported by the Peruvian laws for the protection of native products and protected areas such as the Law on Protection of Access to Peruvian Biodiversity and the Collective Knowledge of Indigenous Peoples, Law No. 28216. In addition, the support of existence resources through bibliographic sources and research about the industrial potential of the native fruits and palm tree species which are the most exportable products. In addition to the opinion of environmental researcher Maria Pinedo based on her 35 years of studies on the Peruvian Amazon on the conservation of exploited resources through ecological and non-invasive techniques.

Sub question three: Does the offer of native fruit comply with the three pillars of bio trade?

Economic Development of Bio Trade Companies

The research concludes that **peruvian bio trade product derived from the native biodiversity could be sustainable and it complies with the three fundamental pillars of the bio trade**. Regarding economic development, Bio trade in Peru applies the four criteria according to Development Bank of Latin America (CAF). Also, peruvian bio trade companies developed to increase their export potential

following the consumption tendencies and the government's promotion to boost exports. This statement is based on the evaluation made to Peruvian companies that participated in bio trade projects where more than 50% of companies comply with the Conservation and Sustainable Use of Biodiversity. The companies that exceeded their satisfaction by 80% were due to the fact that the companies have an environmental awareness of the due use of their resources that allows them to enter more markets and direct participation with the associations of the producers. Also add the collaboration of the projects and programs developed or supported by the commission set up to promote the bio trade. In both cases, it is clear that the value chain approach is key to implementing a business. The value chain approach is key to implementing a business.

Finally, after the process of data collection of secondary sources, primary and dependency tests applied to the results of the survey, it is concluded that **it is possible to develop an exportable offer of native products of Peruvian biodiversity that belong to the Bio trade**. This conclusion was reached on the results supported by the progressive growth of demand for products from this business model, the interest of consumers on the supply and innovation of products on consumer trends. In addition, of the investigations mentioned on the availability and potential of the native species supported by protection laws and the awareness of the Peruvian companies of the bio trade with the respect of the pillars of sustainability for a growth of the exportable supply. It must be added to this the interviews with the officials who shared the line of evolution of the development of investment projects of the bio-commerce in advice and financing to the micro-entrepreneur with initiative.

2. Recommendations

Sub question one: Is there a growing demand for Peruvian native fruit that belong to bio trade?

- The National Commission of Bio trade Promotion should promote not only the export, but also the local demand for the native fruits that contribute to the growth of the exportable supply and improve the nutrition of the Peruvian settlers.
- Promote the creation of producer associations of the bio products to consolidate the supply of quality raw material. This will contribute to strengthen the first link of the raw material and integrate the informal economy of rural areas to the modern economy.

Sub question two: Is there availability of resources for the production of native food of sustainable extraction?

- The audit of regional governments for the support and development of their communities that contribute to the sustainable business as part of their responsibility.
- Training for producers about how the bio trade and the importance of the role they play in their community. In addition to management tools that allow the business to be managed sustainable over time.

Sub question three: Does the offer of native fruit comply with the three pillars of bio trade?

- The Peruvian government should encourage young students to contribute through scientific research to the protection and conservation of native species, as well as in sustainable extraction and renewal. Also include regional universities, where bio trade is developed, within the research line of support of the members of the National Commission for the Promotion of Bio trade (CNPB).
- The government should create a policy aimed at rural development based on the use of biodiversity.
- Provide facilities to companies for certification and inspections that ensure compliance with all criteria and principles of bio trade in Peru, will contribute to equitable growth and expands the recognition of Peruvian native fruits.
- Drastic changes in Peruvian laws to control institutional national and regional programs that are an obstacle in the development and advancement of native communities and obtain bio trade benefits.

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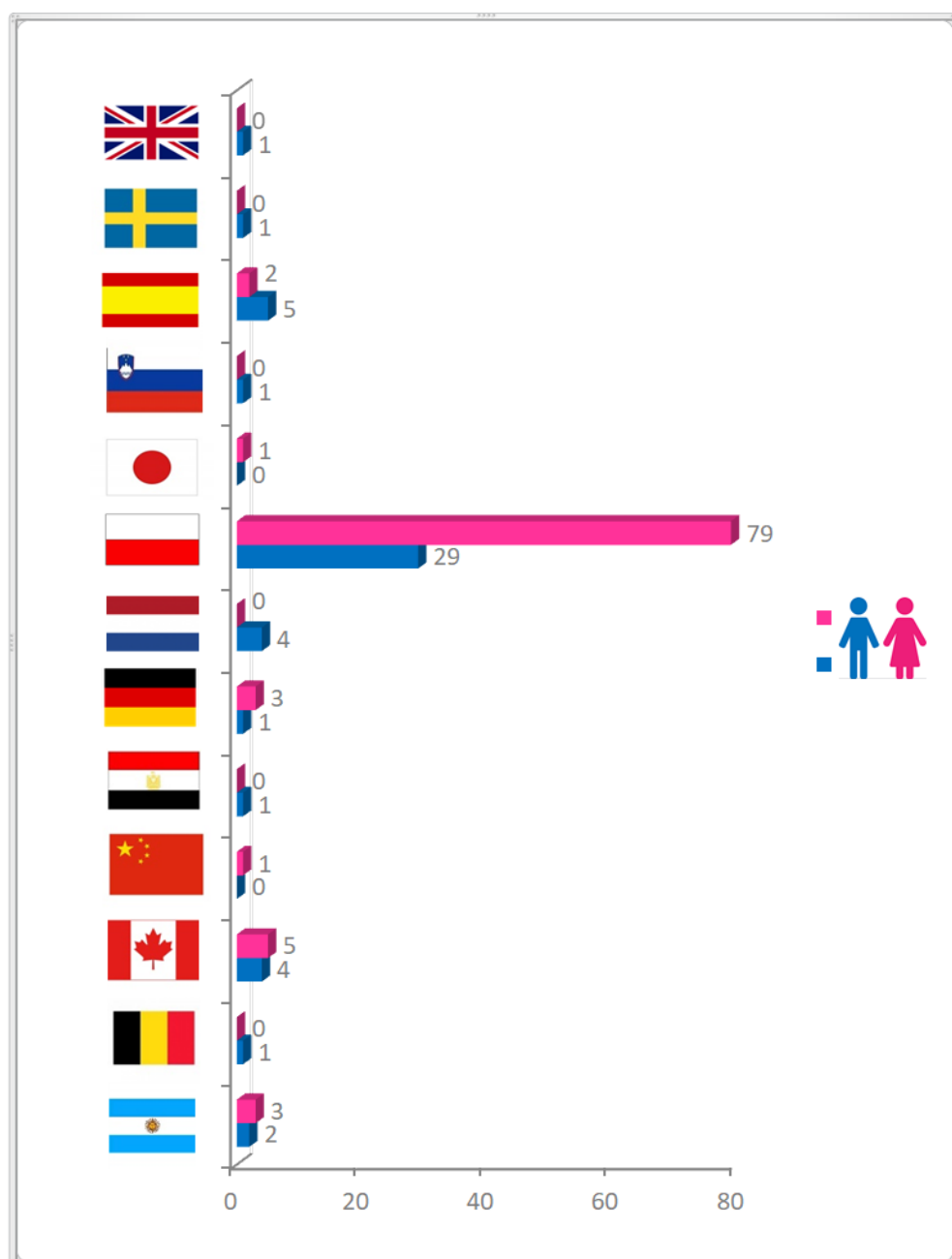
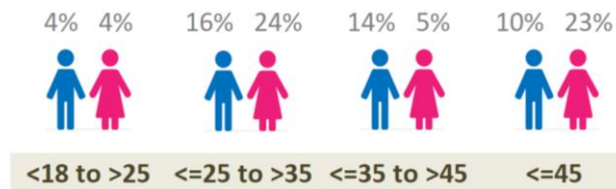
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Appendices

1. Results of survey



		Yes	No			
Q4	Are you aware of the concept belongs to BioTrade?	125	19			
		87%	13%			
Q5	Have you tried it? Or would you try it if it was more targeted towards consumers?	Yes I would try it if it was more relevant to my lifestyle	Yes I've tried it	I haven't tried it yet	I have no interest in trying it	
		84	51	9	0	
		58%	35%	6%	0%	
Q6	DEMAND My consumption of bio products steadily increases	Definitely yes	Yes	Not Sure	No	Definitely no
		89	28	18	9	0
		62%	19%	13%	6%	0%
Q7	CONSUME The proportion of your spending on agroproduct of this category has increased?	Yes	No			
		131	13			
		91%	9%			
Q8	Approximately, how much is the percentage of growth?	More than 20%	16 - 20%	11 - 15%	6 - 10%	0 - 5%
		5	29	46	30	34
		3%	20%	32%	21%	24%
Q30	BIO FOOD PURCHASING FACTORS My income cover shopping expectations	Very important	Important	Neutral	Little important	Not important
		33	52	33	17	9
		33%	52%	33%	17%	9%
Q32	(healthy, nutritional, social responsibility,	Very important	Important	Neutral	Little important	Not important
		57	68	19	0	0
Q34	Biotrade is or would be my first option	Very important	Important	Neutral	Little important	Not important
		38	45	54	7	0
Q33	food if you knew the company pays attention to the ethical sourcing of biodiversity?	Definitely yes	Yes	Not Sure	No	Definitely no
		49	74	19	2	0
		44	60	31	7	2
		31%	41%	22%	5%	2%
Q21	PRICING FACTORS The price should not limit my shopping	Very important	Important	Neutral	Little important	Not important
		19	45	51	17	12
		16	63	43	13	9
		34	50	33	16	11
		23	53	42	15	11
		16%	37%	29%	11%	7%
Q23	Pay more compared than other regular food	Very important	Important	Neutral	Little important	Not important
		16	63	43	13	9
Q31	Increment of price (<20%) is acceptable if it contributes to society and/or the	Very important	Important	Neutral	Little important	Not important
		34	50	33	16	11

Intrinsic characteristics

PURCHISING FACTORS		Very important	Important	Neutral	Little important	Not important
Q10	Products do look nice	18	53	33	25	15
Q12	Available all year long	13	23	56	38	14
Q14	Healthy	57	87	0	0	0
Q15	Easy to use (cut, appropriate size, peeled, mixed, etc.)	33	38	42	26	5
Q16	Variety of products	26	59	35	12	12
Q22	Quality	47	84	13	0	0
Q25	I know where it comes from	23	32	40	30	21
Q29	Tasty, tasting varieties	19	28	53	24	20
		30	50	34	19	11
		20%	35%	24%	13%	8%
Q9	Certificate of Biotrade	24	60	22	19	19
Q11	Guarantee, Brands that convey trust in their superior quality	12	25	72	23	12
Q27	The list of ingredients /components-information on packaging and labelling	39	67	26	12	0
		28	51	36	19	11
		20%	35%	25%	13%	7%

Altruistic motive

ENVIRONMENTAL FACTORS		Very important	Important	Neutral	Little important	Not important
Q13	Avoid use of pesticides or chemicals	78	56	10	0	0
Q18	Good for the environment	47	92	5	0	0
Q20	Company's sustainable supply chain	48	56	34	6	0
Q28	Biodiversity conservation (ecology)	55	78	9	2	0
		57	71	15	2	0
		39%	49%	10%	1%	0%

*

SOCIAL FACTORS		Very important	Important	Neutral	Little important	Not important
Q17	Help society	57	67	13	7	0
Q19	Supports the local economy	17	67	43	17	5
Q24	Take into account human rights	44	88	12	0	0
Q26	Equality benefits	55	69	15	5	0
		43	73	21	7	1
		30%	50%	14%	5%	1%

2. List of Native Peruvian Fruits and Plants

Specie	Scientific name	Properties and Uses
Aguaymanto	<i>Physalis peruviana</i>	Rich in vitamins A and C. Presentations: juices, dehydrated and jams.
Algarrobo	<i>Prosopis pallida</i>	Contains vitamins B1, B2, B3 and provitamin A or beta carotene. It is energizing and antioxidant. Presentations: coffee, fortified cookies and nutritional supplements.
Cacao nativo de aroma	<i>Theobroma cacao</i>	Antioxidant, source of vitamin C, fiber and serotonin. Presentations: its almonds they constitute the basic input for the industry of chocolate, pharmaceutical and cosmetic.
Camucamu	<i>Myrciaria dubia</i>	Natural source of vitamin C and antioxidant. Presentations: used in energy drinks and dairy.
Castaña	<i>Bertholletia excelsa</i>	Source of proteins and amino acids. delicious in unsaturated fats that contribute to Reduce the level of cholesterol in the blood. Presentations: whole chestnut, oils and Creams.
Chancapiedra	<i>Phyllanthus niruri</i>	Protects from the formation of kidney stones, to the liver, diuretic, antibacterial and anti-inflammatory. Presentations: pulverized, Filters and capsules.
Chirimoya	<i>Annona cherimolia</i>	Source of thiamine, riboflavin and niacin that They are part of vitamin B. Presentations: Fresh fruit, pulp and juices.
Chuchuhuasi	<i>Maytenus acrocarpa</i>	Used by native communities against arthritis, rheumatism and back pain. Presentations: powdered and extract.
Hercampuri	<i>Gentianella alborosea</i>	It has erythrine, alkaloids, heterosides, saponins, tannins, resins, waxes, hemicellulose, They provide detoxifying effect. Presentations: powder and capsules.
Huito	<i>Genipa americana L</i>	Used to paint outfits. The macerated fruit In rum it is the basis for preparing traditional liquor. Presentations: natural, powder and liquor.
Kiwicha	<i>Amaranthus caudatus</i>	Great source of protein, vitamin E and complex B. Presentations: flour and derivatives, cereals and drinks.
Lúcuma	<i>Pouteria lucuma</i>	Source of iron, niacin and vitamin B3. Presentations: in addition to its consumption as gourmet product, used as flavoring in pastries, ice cream and drinks.
Maca	<i>Lepidium meyenii Walp</i>	Concentration of calcium, vitamins C and E, proteins and amino acids. Presentations:

		flour and derivatives, drinks and capsules.
Maíz gigante	<i>Zea mays</i> var. <i>Urubamba</i>	Great source of protein Presentations: snacks and soups.
Maíz morado	<i>Zea mays</i> L	Source of anthocyanins of antioxidant value. Presentations: drinks, flour and derivatives.
Molle	<i>Schinus molle</i>	It is used as a digestive and flavoring. Soothes rheumatic pain and inflammation. Is healing, purgative and antiparasitic. Presentations: jam, seeds and oil.
Muña	<i>Minthostachys mollis</i>	High calcium and phosphorus content, favor bone growth and maintenance and teeth It serves for fracture healing, dislocations and tumors. Presentations: powder and crushed
Pasuchaca	<i>Geranium dielsianum</i> Knuth	Antidiabetic, astringent and anti-inflammatory. Presentations: capsules, powder, extract and natural.
Quinoa	<i>Chenopodium quinoa</i>	Source of carbohydrates and proteins. Excellent balance of essential amino acids. Presentations: flour and derivatives, natural, soft drinks, energy bars and cereals.
Ratania	<i>Krameria lappacea</i>	Used as astringent, antidiarrheal, antidiarrheal, antihemorrhoidal and anti-inflammatory. Presentations: crushed and chopped.
Sacha inchi	<i>Plukenetia volubilis</i> Linneo	Source of omega 3, 6 and 9. Recommended for the prevention and decrease of cholesterol. Presentations: seed, roasted, natural, oil, powder, snacks, cosmetics and capsules.
Sangre de grado	<i>Croton dracanaoides</i>	Accelerates internal and external healing processes for its taspine content. It is astringent, hemostatic, antiseptic, depurative and regenerative of muscle tissue. Presentations: latex, extract and Cortex.
Sauco	<i>Sambucus peruviana</i>	Rich in vitamin C. Presentations: fresh and jams
Tara	<i>Caesalpinia spinosa</i>	Tannins with astringent properties are extracted and coagulants. Presentations: crushed, flour, gum, tanning preparation and seed.
Yacón	<i>Smallanthus sonchifolius</i>	It is used to make syrups for patients with diabetes and reduces the level of cholesterol Presentations: honey, flour, flakes, extracts and infusions.

Fuente: PNPB 2012

3. List of Companies Certificated by Bio Trade Peru

1	AGROINDUSTRIAS HUAYLLACAN S.A.C.	85%
2	AGROINDUSTRIAS OSHO S.A.C.	98%
3	AICACOLOR S.A.C.	80%
4	ALGARROBOS ORGANICOS S.A.C.	99%
5	AMAZON ANDES EXPORT	91%
6	AMAZON HEALTH PRODUCTS S.A.C	90%
7	ANDES FOOD COMPANY S.A.C	81%
8	ATYI PERU NATURE PRODUCTS E.I.R.L.	77%
9	AVENDANO TRADING COMPANY S.A.C.	80%
10	CENTRO DE REHABILITACION DE TOXICOMANOS Y DE INVESTIGACION DE MEDICINAS TRADICIONALES TAKIWASI	92%
11	COMERCIO ALTERNATIVO DE PRODUCTOS NO TRADICIONALES Y DESARROLLO EN LATINOAMERICA-PERU	97%
12	COOPERATIVA AGRARIA APPROCAP L.T.D.A	81%
13	COOPERATIVA AGRARIA DE PRODUCCION ORGANICA HUAMANPATA MOLLEPATA (CAPOHM)	78%
14	COOPERATIVA AGRARIA PRODUCTORES DE TARA DEL NORTE	86%
15	COOPERATIVA AGRARIA PRODUCCION SENOR DE HUANCA (CAPOSH)	77%
16	COOPERATIVA AGROPECUARIA DE SERVICIO VALLE DEL CUNAS L.T.D.A	78%
17	COOPERATIVA DE SERVICIOS MULTIPLES FRUTOS DEL ANDE CAMPO VERDE	75%
18	CRUZ CAMPO PERU S.A.C	85%
19	ECOANDINO S.A.C	93%
20	ECOINCA S.A.C	83%
21	GREENBOX	77%
22	GOLDEN BERRY COMPANY S.A.C.	80%
23	HERSIL S.A.	97%

24	INDUSTRAS MAYO S.A.	86%
25	LABORATORIO QUIMICO FARMACEUTICO NATURA LAB S.A.C	88%
26	PERUVIAN HERITAGE S.A.C	95%
27	PERUVIAN NATURE S&S SAC	95%
28	SHANANTINA S.A.C	92%
29	SHIWI SAC	94%
30	SOLUCIONES AVANZADAS EN AGRONEGOCIOS WIRACCOCHA DEL PERU S.A.C.	89%
31	VITALLANOS PERU SAC	86%
32	WARI ORGANIC SAC	76%

4. Record of interviews

Next, it is presented the records of the interviews, which have recorded calls. It is necessary to explain that the contacts of the ministry of agronomy, Head of the Unit of. Promotion of the AGROIDEAS Program, despite specifying the interview in advance, was not available. After the agreed date, they have not answered for a reprogramming of the interview in any way.

4.1. Interview 01

Interviewee: **Ing. Mario Pinedo Panduro**

Position: **Researcher of Pro forests of Amazon**

Institution: **Research Institute of the Peruvian Amazon, Iquitos IIAP**

1. Is there agricultural potential to exploit native fruits? How much is the current percentage of our biodiversity that is being exported?

In general, the volumes are low to think about export, they are niche markets. The main falls have been because there was no structured plan to sustain it in time in the 90's. In Loreto it is difficult unlike other Amazonian regions it is more developed because there are no roads. However, several projects have been developed such as the integral flour of the camu camu fruit where it has an orientation towards the capsule associated with vitamin C. The production in low area is affected by climatic accidents in the country. The Aguaje, the palm tree in natural form, there are 5 million hectares as it is a natural system are difficult to access, they are males (they have no fruits) and tenure effect is another difficulty. Certification is not possible if volumes are low.

However, regions such as the Ucayali and Madre de Dios are of sustainable production. Other fruit trees with more development is the chestnut in Madre de Dios in the jungle. The organic production market

in Loreto, are in the process of domestication for new native products so volumes are low. However, Peru has technology to develop it and its nature that adapts.

What a sustainable export can cover is camu camu and chestnut cocoa. The camu camu in the Loreto region can supply no more than 50 tons of pulp and is seasonal in the region. The implementation of harvest periods depends on seasonality, topography and altitude. It begins in high areas such as Ucayali and ends in low areas. If it is completed with other areas it can be said about 3 months of production.

2. Do you believe that Peru manages natural resources in an orderly manner?

The country will be far from it if there is not a good regional government. There is a difficult contradiction to reconcile between business developments and regional administration. The regional government is the one that hinders the growth of exports of native fruits

3. What is the productivity of soils in native fruit agriculture?

There is a belief that the jungle eyebrow is not for agriculture however this is somewhat relative. Soils are different but with technology it is possible and in a sustainable way. The quality of the soil is quite relative. In Loreto there are soils with acidity of 3.54, extremely acid, which is said to be not agricultural soils. However, the camu camu grows there. The floodplains, on the edge of the rivers, have a pH of 7 or 7.5 and despite this, the nutritional quality is higher than average. The issue is that geographic areas become agriculturally productive if there is an incentive to produce and invest. Like the case of Israel, which is a desert but invests in technology and becomes agricultural? To be sustainable, it must also be thinking that losing forest also means losing other things. This is where it must be entered with conservation agriculture and reforestation

4. Is there a use compatible with nature conservation and profitability? There is no way to steadily increase the export of native fruits of biodiversity? in regions of the Amazon and the Andes?

Moral integrity is the basis of sustainability. The world is in environmental crisis if it is followed without changing the attitude of economic exploitation on the equitable benefit in the bio trade system. A publication will be published in the Institute of the Peruvian Amazon where sustainability is a process based on moral integrity. To make way for biodiversity and for the rest to come by default. The "how" and "what" you know how to do, second step, participation agriculture that participation will have in 50 years. Agriculture in the lower area will not be a base like oil. Not preponderant. Activities that do not conflict or conflict with environmental sustainability such as tourism, leaving forests such as Copaiba, Palo de Rosa (an input used in Channel perfumes), extracting in a sustainable manner that does not open space to the forest. Scale growth can be dangerous. A growth of 3% would be its maximum

5. Will the uncertainty about the effect on trade in native fruits vary from one producing region to another?
"

This varies according to its rulers. Loreto is not integrated into the economic circuits; San Martin has occupied first place in economic development but social inequality and this happens all over the world. The jungle coast area (Ica) stands out in horticulture like Piura. San Martin and Ucayali oil palm Camu

Camu. In that scenario, Loreto could develop with an integrated government even better than the other regions.

6. The "National Strategy on Climate Change, the Adaptation and Mitigation Action Plan - risk management and adaptation to climate change in the agricultural sector", details the priorities of certain products and / or regions, but lacks specific measures for many export crops, what is the case of native fruits?

There is a favorable evolution but results it cannot be taken yet. There is a work of investigation and promotion of the native fruit trees of the Amazonia. In technology there is good development. The integrity from which is the research and promotion for training farmers

7. What projects have been developed on native bio trade products in recent years?

In the fruit trees project, there are other entities that have developed a project such as the PEDIT that works with added value in specific areas. Some producers have developed development projects with the help of FONCODE.

4.2. Interview 02

Interviewee: **Caridad Maldonado**

Position: **Specialist of the Sustainable Trade Department PROMPERU**

Institution: **PROMPERU- Ministry of Foreign Trade and Tourism**

1. How is BioTrade contributing to the development of the country?

Bio Trade is a commercial opportunity of native diversity that contributes to the social, environmental and economic sustainability of the country. Being our country, a megadiverse country is of great importance for international markets and this contributes to our native communities, competitiveness of our companies and boosts technological development at the national level.

2. Do you think that the country, at the level of other agro-exporting countries, is far from sustainable development (long-term)?

Among the products of Amazonian fruits, Peru has as products of exportable importance: the Achiote in the 6th position, the Turmeric in the 12th position, the Camu camu in the 14th position In 2014, the Camu camu was exported 2'000,000 and in 2018 Peru exports 2'780,000 million dollars. In the case of quinoa that occupies first place the 137 million there is a big difference with the Amazonian fruits but there are no large extensions.

3. Do you think that international demand is sustainable, or what is your opinion? Will it continue in time? What does PROMPERU do to achieve it?

It is given priority to products that have greater exportable importance, such as special coffees, fine aroma cocoa and aguaymanto. In the latter case, it is worked on the management of organic certification in the Huánuco region. 5 tariff items.

4. it is heard traditional fruit exports grow. However, do you think that the demand for products (fruits native to our biodiversity) belongs to bio trade is growing internationally? What are the factors or causes that are due?

What has driven us has been the very interesting opening of the Asian market in general for the agro exports that has reached 509% of the pomegranate, versus the decay of mango, lemon asparagus camu camu only grows in stands. The institution only go to Rodriguez de Mendoza where it is flooded and difficult to move there are no data of hectares or how many in production. It is known that there are 80 plots for a project in 2015 as fruit. There are no organized cooperatives. Here also comes to carve the Nagoya Protocol. Indigenous and Amazonian populations of the country are headed by MINAM. The advantage is not to send as fruit, but with added value. Like the freeze-dried camu camu flour. Camu camu is not an extensive crop and quality standards must be controlled.

5. What are the main buyers of fruits native to biotrade?

The main destination markets for these products were the United States (35.7%), China (5.9%), Canada (5.7%), Germany (5.2%), Brazil (4.6%), The Netherlands (3.9%), United Kingdom (3.8%) %, Spain (3.5%), Australia (3.2%), Denmark (2.8%), Italy (2.7%), France (2.5%) and Japan (2.3%).

6. What are the main obstacles / growth to the sector in the line of native products?

The main obstacle is native production for industry and final consumer, novel food. Permit tariff restriction is the first barrier. Other obstacle could be the permission to enter in EU Markets.

7. The certifications, how many exporters have Bio trade certification in native fruits? Why can not they?

Europe is not demanding if it is organic or not but depends on the market. Product unawareness, There is no market study. When they start the business. Peru has 43 nationally certified companies currently under the bio trade model. The country has a National Strategy for the Promotion of Bio trade that has been developed by the National Commission for the Promotion of Bio trade (CNPB) which consists of 14 institutions (public and private) and has a matrix verification tool that evaluates companies according to the 7 principles of bio trade. If according to the evaluation, the company obtains = <75% they make use of the BIOCOMERCIO PERU logo for communication via email or flyer to promote the brand. It is not certification, then it does not go into the product. When the company obtains the authorization, an office is issued and a report is prepared to verify.

8. Biocommerce and community development, What is the relationship between exporting companies and native communities? How is the equitable benefit created?

The issue of associativity as an equitable benefit in the value chain where there is transparency in prices, stakeholder involvement, training, productive base is not sustainable. Need more than obligation will sustain its productive base. As an example, quinoa as the company Ensure. In the case of Amazonian fruits, group of researchers are traveling to Tarapoto at the request of the region where it indicates that they are doing their job well.

9. How do you think that the offer of the exporters of native fruits belonging to the biotrade can have sustainable development?

10. The Peruvian native products that belong to the biotrade are destined to the international market, what is the development of the commercialization in the national market?

In local market still look for price, but not for quality. A grown but this data is by the Ministry of Production

11. How does PROMPERU contribute to the incentive or development of bio trade in Peru with respect to new products such as the case of native fruits?

Research, Development and Innovation (R + D + I), this has been one of the priority topics as part of the Bio trade Agenda and must be taken into account if a new product is to be developed. Peru has many products of biodiversity, but it is necessary to develop scientific research of the product to prepare a dossier and present to the European Community. Without it, it does not come to the market. That's expensive. Research studies are carried out by national and private universities.

PROPERU encourages those value chains with export importance that meet the requirements. It promotes the exportation of lucuma, fine aroma cocoa and lately the special coffees.

4.3. Interview 03

Interviewee: **Vanessa Ingar Elliott**

Position: **Biodiversity Specialist of the Conservation Directory**

Institution: **Ministry of Environment of Peru (MINAM)**

1. How would you define BioTrade in Peru?

Our country is very rich in biodiversity and is truly a privilege and presents many opportunities for business, but responsible business. Not only as a business that sees the commercial part and the profit, but backwards. How many people are benefiting (producers, collectors) are articulated to the chain and give added value to my product. Then, on this base of condition of a biodiverse country, our country represents an excellent opportunity for the development of biotrade. Biotrade is simply doing things right. Work with our biodiversity either at a point of collection, production or marketing. Of our native products and service that ecosystems give us. Do it responsibly and intelligently and make a real commitment to the conservation of biodiversity.

2. Does Peru have certified forests? Do companies already have certification? The countries where they demand our products ask that the products come with certified forests. In 2012, 90% of forests in our Amazon were already certified.

While biotrade is a business model and is not a certification. But it is a how to do things with biodiversity. There is currently a tendency of the market to acquire sustainable products: wood from certified forests, resources that come with certification that give environmental social economic support. Peru has very fashionable organic products, fair trade products. Not only in the international market but also in the national market such as Amazonian fruits already presented as ready-to-drink soft drinks and other novelties have a story to tell. Collecting producers and entrepreneurs who do apply the biotrade

approach and are also ensuring their responsibility and commitment to the development of sustainability in our country.

3. It is good to satisfy domestic consumption. The consumption of our products not only for taste but for nutrition.

Our natural products are diverse and also the properties they present are diverse nutritional, cosmetic beauty, energy, etc. what can be taken advantage of It is important that Peruvians take advantage of and consume native products that have so much variety, benefits and health in our hands and we look for other products we prefer other unhealthy ones that do not give profit to our producers. Contribute to the revitalization of the economy consuming products of biotrade makes the regions move because that is where the products are.

4. That it is better for producers to export or sell locally. Which one do you earn the most? Because the decompensation of prices. As the case of quinoa.

It is an interesting question. It depends on which markets you want to approach who your customers are and your operating costs. There is an international market that is very demanding of quality, volume and sustainable supply. You have to ensure backwards on the subject of traceability. You have a national market that does not deserve products that are not of quality and the consumer must demand and demand it. So a recommendation for a producer who just started would be to start with the local market to measure their sales volumes and see how much you can give without over demanding the resource. Remember that we work with biocommerce or biodiversity products are not common products. They are not manufactured, they are products that depend on good soil management, as in the case of maca. A rotation of 4 years of the soil so that they have the property of which are selling.

If it is talked about chestnut forests, we are talking about good forest management that allows the forest to heal and give us the fruits is needed. These would be the considerations to have in order to propose a sustainable supply.

5. Although Peru has its Ministry of the Environment, but to work with all the biodiversity of the country, it is necessary to have a mechanism for the different institutions.

What institutions are committed to promote biocommerce in Peru?

Peru have many institutions behind the bio trade. There is in our country from the "National Strategy of Biological Diversity" a National Program of Biological Promotion that takes life through the National Commission of Bio trade.

This group of public and academic institutions are taking shape through the are led to date by the Ministry of Foreign Trade and Tourism and the technical secretariat is led by the emblematic institutions of export promotion, PROMPERU. We are institutions that we were added. In MINAM, dealing with the environmental aspect of bio trade, Ministry of Education through CONCITEX for research and innovation of new products to add value to biodiversity and the Universidad Nacional de la Molina and Universidad Cayetano Heredia. Then the whole that from their mandates and functions contribute to the development

of biocommerce are important is the relevance of the national program. Not only environmental or commercial work but the synergy of public sector work by the private sector is very important for biotrade.

6. You have just mentioned the training of young people plays important role, but it is known that Madre de Dios is one of the protected areas and there is no faculty of biology as there is in Amazonia faculty in Iquitos and Loreto.

It is important and necessary to research and know the resource. For example, the Phenology of the plants and the lack of biologists, technicians, etc. Young people who investigate and not only that it obeys the demand or because the thesis requires it but of non-conventional products.

7. Although there are educational institutions such as Molina and Cayetano, what is the participation of regional universities in the research of biotrade products?

It is part of responsibility of Ministry of Education or CONCITEX

8. The important role of universities, but what are the needs and help needed by the people where these are located ...

The ministry is working on training programs with regional governments. Because they are the ones who decide how much is invested. Destine to the investigation that decide on new products. For example to the regional governments of what is the biotrade. Basic. A government of Loreto and mobilize the universities that contribute to the process of the Amazonian fruits.

9. How many development positions will benefit, how many families will benefit?

Not only the product, but what is behind it. To know how many varieties and seed selection are from the quinoa that is associated with a competitive advantage with BioTrade.

10. Peru is in one of the most privileged areas in the world when it is talked about vitamin c. In which part but is Peru. the camu camu with 66 times more than a lemon.

The goal is for each region to know what benefits its resources have. The important thing is that the region identifies so that investment and research are directed. In this way, the sustainable value chain is built and not only seeks to cover all biodiversity. Take advantage of the capacity of human capital, the launch of the product hood. In addition, the importance of reforestation. The large number of. For example, the needs to inform and innovate the aguaje collectors, without knocking down the tree so that the palm tree continues to live and also with a high content of vitamin from which sunscreens are made. Our sister country of Brazil makes many cosmetic products, such as shampoos. Ask yourself what this palm tree produces.

5. Export of Bio Trade Peru

SPECIE	HS - DESCRIPTION	EXPORT VALUE FOB (US\$) 2014	EXPORT VALUE FOB (US\$) 2015	EXPORT VALUE FOB (US\$) 2016	EXPORT VALUE FOB (US\$) 2017	EXPORT VALUE FOB (US\$) 2018
Quinua	1008509000 – QUINUA (QUINOA) (CHENOPODIUM QUINOA) EXC	195 419 481	144 278 611	103 548 553	120 323 289	124 236 971
	1904900000 – DEMÁS PRODUCTOS A BASE DE CEREALES OBTEN	770 181	2 891 324	4 940 729	6 020 711	7 678 590
	1104299000 – GRANOS DE LOS DEMÁS CEREALES MONDADOS, P	90 845	1 731 057	19 644 360	3 448 421	2 451 981
	1904100000 – PRODUCTOS A BASE DE CEREALES, OBTENIDOS	478 240	576 160	502 565	1 266 383	1 406 581
	1008501000 – QUINUA (QUINOA) (CHENOPODIUM QUINOA) PAR	68 947	158 851	61 257	550	43 481
	Resto	4 589 670	2 360 379	2 968 051	3 048 961	1 749 319
Cochinilla	3205000000 – LACAS COLORANTES; PREPARACIONES A QUE SE	41 782 073	42 017 841	58 924 677	58 110 136	63 999 392
	3203002100 – CARMÍN DE COCHINILLA	28 524 341	34 535 825	52 943 252	44 824 584	36 100 475
	0511991000 – COCHINILLA E INSECTOS SIMILARES	1 290 745	765 391	4 332 255	1 984 855	1 094 255
	3203002900 – LAS DEMÁS MATERIAS COLORANTES DE ORIGEN	14 522	93 357	21 890	238 746	196 634
	3203001400 – MATERIAS COLORANTES DE ORIGEN VEGETAL DE	33 800	2 263	95 165	518 549	109 280
	Resto					
Nueces del Brasil	1518009000 – DEMÁS GRASAS Y ACEITES ANIMALES O VEGETA		21 644			
	0801220000 – NUECES DEL BRASIL SIN CÁSCARA FRESCAS O	30 466 120	34 337 322	40 450 223	46 007 453	64 197 340
	1515900090 – LOS DEMÁS LAS DEMÁS GRASAS Y ACEITES VEG	599 830	483 387	711 470	710 736	1 358 674
	0802420000 – CASTAÑAS (CASTANEA SPP.) , FRESCAS O SEC	9 649	6 468	16 558	243 880	86 111
	1106309000 – HARINA, SÉMOLA, Y POLVO DE LOS DEMÁS PRO	8 706		19 208	3 774	15 359
	Resto	37 625	358 648	135 847	1 091 833	1 321 173
Tara	1106100000 – HARINA, SÉMOLA, Y POLVO DE LAS HORTALIZA					
	2302500000 – SALVADOS, MOYUELOS Y DEMÁS RESIDUOS DEL					
	1404902000 – TARA EN POLVO (CAESALPINEA SPINOSA)	32 936 049	31 412 938	32 590 457	36 424 107	39 711 259
	1302391000 – MUCÍLAGOS DE SEMILLA DE TARA (CAESALPINE	12 970 421	11 449 279	9 640 303	8 600 894	10 573 585
	1302399000 – LOS DEMÁS MUCÍLAGOS Y ESPESATIVOS DERIVA		7 764	8 006	146 033	693 199
	Resto		7 646	90 098	207 500	122 790
Maracuya	2009892000 – JUGO DE MARACUYÁ (PARCHITA) (PASSIFLORA	37 787 203	39 689 457	49 945 894	41 099 344	38 759 477
	0811909400 – MARACUYÁ (PARCHITA) (PASSIFLORA EDULIS)	1 586 271	1 376 572	1 453 823	2 436 064	2 082 080
	2008999000 – DEMÁS FRUTAS O FRUTOS Y DEMÁS PARTÍCULAS	5 190 275	1 199 987	1 661 113	1 819 551	1 592 216
	2202100000 – AGUA, INCLUIDAS EL AGUA MINERAL Y LA GAS	33 323	216 707	382 715	1 075 851	1 066 038
	0810901000 – GRANADILLA, MARACUYÁ (PARCHITA) Y DEMÁS	221 923	223 015	114 570	158 216	182 971
	Resto	277 112	700 069	780 007	560 834	755 268
Achiote	3203002100 – CARMÍN DE COCHINILLA	28 050	41 861	9 225	1 121 827	
	3203001400 – MATERIAS COLORANTES DE ORIGEN VEGETAL DE	11 509 874	13 528 588	14 125 340	20 858 983	17 873 430
	1404909090 – LOS DEMÁS PRODUCTOS VEGETALES NO EXPRESA	800 167	1 156 458	1 274 759	2 275 035	1 490 501
	1404901000 – ACHIOTE EN POLVO (ONOTO, BIJA)	310 164	307 209	146 371	238 601	385 126
	3205000000 – LACAS COLORANTES; PREPARACIONES A QUE SE		17 691		353 703	189 021
	Resto	95 097	434 311	214 172	224 077	222 009
Sacha Inchi	2008199000 – DEMÁS FRUTOS DE CÁSCARA, INCLUIDAS LAS M	128 396	349 918	452 173	5 145 594	12 731 120
	1515900090 – LOS DEMÁS LAS DEMÁS GRASAS Y ACEITES VEG	1 935 455	2 075 751	1 981 730	2 113 844	2 431 809
	2106102000 – SUSTANCIAS PROTEICAS TEXTURADAS	515 889	1 127 984	770 249	752 978	902 048
	1208900000 – DEMÁS HARINA DE SEMILLAS O DE FRUTOS OLE	192 282	578 539	745 324	452 891	291 458
	1106309000 – HARINA, SÉMOLA, Y POLVO DE LOS DEMÁS PRO	27 000	88 238	79 558	88 037	55 678
	Resto	1 132 653	854 839	139 910	765 206	1 107 207
Maca	1106201000 – HARINA, SÉMOLA Y POLVO DE MACA (LEPIDIDIUM	24 468 049	26 988 830	14 996 809	12 308 442	11 257 575
	0714901000 – MACA (LEPIDIDIUM MEYENII), FRESCOS, REFRIG	5 082 198	6 965 901	2 199 273	714 374	379 470
	2106901000 – POLVOS PARA LA PREPARACIÓN DE BUDINES, C	671 142	157 668	87 081	59 816	372 405
	1302199900 – LOS DEMÁS EXTRACTO DE HABAS (POROTOS, FR	453 362	242 998	356 366	256 106	369 924
	2106907900 – LAS DEMÁS COMPLEMENTOS Y SUPLEMENTOS ALI	1 891 333	1 737 004	24 336	46 635	20 936
	Resto	4 460 673	2 400 687	1 257 197	1 157 014	992 046
	1212999000 – HUESOS Y ALMENDRAS Y DEMÁS PRODUCTOS VEG					

Aguaymanto	0813400000 – LAS DEMÁS FRUTAS U OTROS FRUTOS SECOS	1 184 818	1 597 027	2 858 351	3 001 939	4 159 458
	0811909900 – LOS DEMÁS FRUTAS Y OTROS FRUTOS, SIN COC	25 981	53 138	40 508	117 248	209 715
	0810905000 – UCHUVAS (UVILLAS) (PHYSALIS PERUVIANA) F	7 311	21 813	272 442	188 837	116 484
	1806900000 – DEMÁS CHOCOLATE Y PREPARACIONES ALIMENTI	165	5 162	4 753	16 961	25 859
	Resto	410 554	380 722	99 549	149 507	153 925
Ají amarillo	0710809000 – LOS DEMÁS HORTALIZAS INCLUSO SILVESTRES	971 647	1 428 105	1 486 477	1 544 253	1 999 313
	2103909000 – DEMÁS PREPARACIONES PARA SALSAS, Y DEMÁS	836 587	877 262	889 709	1 112 381	992 279
	2005999000 – LAS DEMÁS HORTALIZAS Y LAS MEZCLAS DE HO	428 334	486 842	632 607	534 154	583 720
	0709600000 – FRUTOS DE LOS GÉNEROS CAPSICUM O PIMENTA	229 737	157 296	155 562	183 332	233 594
	0904229000 – LOS DEMÁS FRUTOS DE LOS GÉNEROS CAPSICUM	71 223	84 862	143 266	32 546	141 896
	Resto	460 980	228 425	287 024	334 433	302 410
Maiz Morado	2308009000 – LAS DEMÁS MATERIAS VEGETALES Y DESPERDIC	104 449	260 945	251 620	38 666	
	3203001600 – MATERIAS COLORANTES DE MAÍZ MORADO (ANTO	547 890	1 217 152	1 732 822	1 203 231	1 732 031
	1005904000 – MORADO (ZEA MAYS AMILÁCEA CV. MORADO)	838 068	1 051 525	999 168	1 264 881	1 225 514
	1102200000 – HARINA DE MAÍZ	228 868	230 474	141 118	244 125	172 647
	1102909000 – HARINA DE CEREALES, EXCEPTO DE TRIGO O D	7 413	66 765	4 530	57 998	76 577
	Resto	1 058 826	156 717	158 955	175 584	231 527
Cúrcuma	1302399000 – LOS DEMÁS MUCÍLAGOS Y ESPESATIVOS DERIVA					
	0910300000 – CÚRCUMA	1 497 184	1 344 615	2 731 777	4 404 984	3 145 197
	3203001700 – MATERIAS COLORANTES DE CÚRCUMA (CURCUMI	213 321	155 709	122 362	131 972	116 884
	2103902000 – CONDIMENTOS Y SAZONADORES, COMPUESTOS	68 917	65 579	76 675	84 443	52 168
	2103909000 – DEMÁS PREPARACIONES PARA SALSAS, Y DEMÁS	59 220	12 607		597	3 940
	Resto	2 554	59 403	47 864	43 264	46 884
Lucuma	1106302000 – HARINA, SÉMOLA Y POLVO DE LÚCUMA (LÚCUM	1 348 602	1 887 515	1 756 805	1 922 501	1 482 607
	0811909300 – LÚCUMA (LÚCUMA OBOVATA)	599 727	994 998	779 353	1 117 302	1 017 793
	2008999000 – DEMÁS FRUTAS O FRUTOS Y DEMÁS PARTÍCULAS	53 039	63 240	225 740	226 282	117 507
	1106309000 – HARINA, SÉMOLA, Y POLVO DE LOS DEMÁS PRO	375	5 800	5 350	6 127	77 648
	0403100020 – YOGUR AROMATIZADO CON FRUTAS, CACAO U OT		11 071	6 750	12 632	15 355
	Resto	60 228	278 861	435 671	374 332	228 231
Camu Camu	2009895000 – JUGO DE CAMU CAMU (MYRCIARIA DUBIA)	61 253	25 287	49 657	139 187	
	1106309000 – HARINA, SÉMOLA, Y POLVO DE LOS DEMÁS PRO	1 100 392	997 615	1 792 536	2 194 642	1 865 448
	0811909200 – CAMU CAMU (MYRCIARIA DUBIA)	133 079	497 203	467 859	364 975	586 523
	2008999000 – DEMÁS FRUTAS O FRUTOS Y DEMÁS PARTÍCULAS	118 829	348 329	425 877	64 510	84 238
	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				32 842	21 402
	Resto	586 137	507 493	273 370	129 417	222 436
Uña de Gato	1211905000 – UÑA DE GATO (UNCARIA TORMENTOSA) FRESCOS	743 575	743 519	802 245	901 942	994 399
	3304990000 – LAS DEMÁS PREPARACIONES DE BELLEZA, MAQU	926 455	675 267	667 470	705 787	645 105
	3305100000 – CHAMPÚES	2 691	269		182 980	203 222
	3305900000 – LAS DEMÁS PREPARACIONES CAPILARES	1 374	548		122 977	174 079
	1302191100 – PRESENTADO O ACONDICIONADO PARA LA VENTA	224 987	181 349	113 050	192 163	165 304
	Resto	331 264	224 588	283 799	313 963	312 175
Yacon	1106209000 – HARINA, SÉMOLA Y POLVO DE SAGU O DE LAS	471 005	634 345	1 296 451	1 297 477	1 020 612
	1702904000 – DEMÁS JARABES	184 947	83 217	18 127	126 527	417 088
	1702909000 – DEMÁS AZUCARES, INCLUIDO EL AZÚCAR INVER	409 901	39 923	116 996	39 930	83 776
	2106907100 – COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS	763 814	159 989	292 742	141 366	55 088
	2007999100 – LAS DEMÁS CONFITURAS, JALEAS Y MERMELEADA	149	5 980	2 294	939	32 513
	Resto	1 333 790	918 937	45 449	434 978	529 138
Kiwicha	1008902900 – KIWICHA (AMARANTHUS CAUDATUS) EXCEPTO PA				806 253	1 172 735
	1904100000 – PRODUCTOS A BASE DE CEREALES, OBTENIDOS	31 159	25 661	15 103	60 820	147 140
	1104190000 – GRANOS APLASTADOS O EN COPOS DE LOS DEMÁ	25 894	56 380	192 785	114 250	107 948
	1904900000 – DEMÁS PRODUCTOS A BASE DE CEREALES OBTEN	119 649	293 734	207 474	37 849	78 996
	2106907200 – COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS				10 309	44 321
	Resto	2 732 742	1 445 033	2 350 692	323 781	291 013
Barbaco	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				426 509	697 965
	1302199900 – LOS DEMÁS EXTRACTO DE HARAS					

Chirimoya	1901902000 – HARINA LACTEADA.	109	42			
	0810902000 – CHIRIMOYA, GUANÁBANA Y DEMÁS ANONAS (ANN	145 924	700 141	1 086 871	364 949	541 287
	0811909900 – LOS DEMÁS FRUTAS Y OTROS FRUTOS, SIN COC	1 465 773	1 851 227	663 512	1 439 824	262 513
	2008999000 – DEMÁS FRUTAS O FRUTOS Y DEMÁS PARTÍCULAS	19 431	10 582	430 405	38 332	220 928
	1905310000 – GALLETAS DULCES (CON ADICIÓN DE EDULCORA	2 008	4 276	3 627	7 241	7 608
	Resto	3 728	14 282	15 343	126 825	28 203
Sangre de Grado	1302199900 – LOS DEMÁS EXTRACTO DE HABAS (POROTOS, FR	562 476	256 348	209 131	142 836	198 069
	1301909090 – LOS DEMÁS GOMAS EXCEPTO GOMA ARÁBIGA, GO	150 504	26 755	35 898	27 334	46 727
	1302399000 – LOS DEMÁS MUCÍLAGOS Y ESPESATIVOS DERIVA	30 900	43 822	58 493	8 964	42 702
	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				2 309	26 962
	1302191900 – LOS DEMÁS EXTRACTO DE UÑA DE GATO (UNCAR	200	418		9 100	21 880
	Resto	31 487	42 235	12 650	25 940	25 158
Chancapiedra	1302191900 – LOS DEMÁS EXTRACTO DE UÑA DE GATO (UNCAR	4 087	166	6 750		
	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				174 784	234 002
	2106907100 – COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS	26 954	34 816	40 209	66 663	46 453
	0902100000 – TE VERDE (SIN FERMENTAR) PRESENTADO EN E			4 188	4 059	3 292
	Resto	170 786	135 492	161 459	55 088	55 136
Tuna	0802900000 – LOS DEMÁS FRUTOS DE CÁSCARA, FRESCOS O S					
	2008999000 – DEMÁS FRUTAS O FRUTOS Y DEMÁS PARTÍCULAS	2	32 041	83 747	262 459	280 940
	0810909000 – LOS DEMÁS FRUTAS U OTROS FRUTOS FRESCOS	3 161	4 560	2 407	5 694	5 590
	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE					352
	Resto	36	84	1 831	162	3 160
Granadilla	0810901000 – GRANADILLA, MARACUYÁ (PARCHITA) Y DEMÁS	102 167	98 187	70 621	111 514	158 742
	2202100000 – AGUA, INCLUIDAS EL AGUA MINERAL Y LA GAS	105 078	97 514	116 451	87 196	91 717
	0811909900 – LOS DEMÁS FRUTAS Y OTROS FRUTOS, SIN COC	5 176	126	599	202	13 362
	3302109000 – DEMÁS MEZCLAS DE SUSTANCIAS ODORÍFERAS P	3 747	3 160	2 765	1 466	4 283
	0811909400 – MARACUYÁ (PARCHITA) (PASSIFLORA EDULIS)					370
	Resto	12 593	55 743	29 819	4 279	13 371
Molle	1302191900 – LOS DEMÁS EXTRACTO DE UÑA DE GATO (UNCAR	270		525		
	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				107 644	154 610
	Resto	3 030	198 555	607 963	196	
Maiz Gigante del Cusco	1005909000 – LOS DEMÁS MAÍZ EXCEPTO MAÍZ DURO (ZEA MA	309		153		
	Resto		3 953	67 849	51 390	147 826
Guanabana	0811909500 – GUANÁBANA (ANNONA MURICATA)	18 085	17 598	49 820	89 165	43 643
	2106907100 – COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS			3 555	11 412	6 932
	2008999000 – DEMÁS FRUTAS O FRUTOS Y DEMÁS PARTÍCULAS	40 405	6 703	6 304	12 154	6 485
	0403100020 – YOGUR AROMATIZADO CON FRUTAS, CACAO U OT		7 595	5 775	9 808	5 626
	2202990000 – BEBIDAS NO ALCOHÓLICAS, EXCEPTO LOS JUGO				3 402	1 771
	Resto	71 289	74 606	40 152	45 261	35 493
Algarrobo	1212920000 – CAÑA DE AZÚCAR FRESCA, REFRIGERADA, CONG	154 040	152 632	121 690	69 229	46 278
	1106100000 – HARINA, SÉMOLA, Y POLVO DE LAS HORTALIZA			27	4 380	25 250
	Resto	9 157	11 259	10 838	1 581	17 838
Aguaje	1515900090 – LOS DEMÁS LAS DEMÁS GRASAS Y ACEITES VEG	18 159	38 107	37 703	43 136	37 374
	1106309000 – HARINA, SÉMOLA, Y POLVO DE LOS DEMÁS PRO	5 135	1 492	5 622	1 836	24 243
	0810902000 – CHIRIMOYA, GUANÁBANA Y DEMÁS ANONAS (ANN				550	427
	0811909900 – LOS DEMÁS FRUTAS Y OTROS FRUTOS, SIN COC	1		181	1	288
	1211909099 – LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				2 444	90
	Resto	20 420	10 106	46 861	13 754	24 785
Cañihua	1008909900 – LOS DEMÁS CEREALES EXCEPTO QUINUA (CHENO				60 175	48 579
	1904900000 – DEMÁS PRODUCTOS A BASE DE CEREALES OBTEN		2 677	20 010	2 881	9 803
	1008509000 – QUINUA (QUINOA) (CHENOPODIUM QUINOA) EXC	103 606	8 993	229 781	283	1 300
	1904100000 – PRODUCTOS A BASE DE CEREALES, OBTENIDOS	121		32 620	613	847
	Resto	600 013	835 052	1 064 175	3 547	25 951

	2106907100 - COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS	928	2 572	135	177	1 073
	Resto	18 865	18 179	22 318	39 821	73 060
Huanarpo	1302191900 - LOS DEMÁS EXTRACTO DE UÑA DE GATO (UNCAR	540		730		
	1302199100 - PRESENTADO O ACONDICIONADO PARA LA VENTA				227	
	1302399000 - LOS DEMÁS MUCÍLAGOS Y ESPESATIVOS DERIVA				320	
	2106907200 - COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS					
	1211909099 - LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				44 576	27 021
	Resto	1 382	94 506	32 940	65 446	8 702
Caigua	1211909099 - LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				1 169	8 381
	0709999000 - LAS DEMÁS HORTALIZAS, FRESCAS O REFRIGER	2 960	9 948	6 677	4 908	6 629
	0710809000 - LOS DEMÁS HORTALIZAS INCLUSO SILVESTRES	14 790	10 084	33 793	6 588	4 078
	0712909000 - DEMÁS HORTALIZAS, MEZCLAS DE HORTALIZAS,	1 037	22 540	1 209	3 017	1 080
	Resto	20 508	20 511	4 594	4 464	11 872
Hercampure	2106101900 - CONCENTRADOS DE PROTEÍNAS EXCEPTO DE SOY				30	
	1211909099 - LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				9 116	29 631
	2106907100 - COMPLEMENTOS Y SUPLEMENTOS ALIMENTICIOS	12 622	24 990	657	11 133	808
	Resto	15 600	20 130	23 187	2 940	11
Chuchuhuasi	1302191900 - LOS DEMÁS EXTRACTO DE UÑA DE GATO (UNCAR	630		575		
	1211909099 - LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				22 754	29 262
	Resto	16 241	37 786	27 612	951	270
Huito	Resto	5 850	5 915	3 443		17 213
Copaiba	1515900090 - LOS DEMÁS LAS DEMÁS GRASAS Y ACEITES VEG	4 134	2 196	3 435	1 952	10 149
	1301909090 - LOS DEMÁS GOMAS EXCEPTO GOMA ARÁBIGA, GO	1 435	3 096	6 362	30	2 160
	Resto	240		37	1 500	2 184
Muña	1211909091 - LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				310	
	1704901000 - BOMBONES, CARAMELOS CONFITES Y PASTILLAS					
	1211909099 - LAS DEMÁS PLANTAS, PARTES DE PLANTAS, SE				6 763	8 763
	0909620000 - SEMILLAS DE ANÍS, BADIANA, ALCARAVEA O H					452
	Resto	5 981	3 814	9 463	1 604	21
Copoazu	1515900090 - LOS DEMÁS LAS DEMÁS GRASAS Y ACEITES VEG					
	2007999100 - LAS DEMÁS CONFITURAS, JALEAS Y MERMELADA		2 250			
	2008199000 - DEMÁS FRUTOS DE CÁSCARA, INCLUIDAS LAS M					
	3304990000 - LAS DEMÁS PREPARACIONES DE BELLEZA, MAQU					4 800
	Resto	1 221	1 725	6 805	23	177
Cocona	0802900000 - LOS DEMÁS FRUTOS DE CÁSCARA, FRESCOS O S				109	
	0810901000 - GRANADILLA, MARACUYÁ (PARCHITA) Y DEMÁS	23	49	13	102	
	2103909000 - DEMÁS PREPARACIONES PARA SALSAS, Y DEMÁS	3		4 110		
	0810909000 - LOS DEMÁS FRUTAS U OTROS FRUTOS FRESCOS		14		52	3 267
	0811901000 - DEMÁS FRUTAS Y OTROS FRUTOS, SIN COCER O				96	23
	Resto	370	260	77	285	227
	Resto	370	260	77	285	227
Saucu	2007999100 - LAS DEMÁS CONFITURAS, JALEAS Y MERMELADA	7 446	2 962	6 288	219	2 485
	0403100020 - YOGUR AROMATIZADO CON FRUTAS, CACAO U OT			579	99	215
	Resto	196	0.12	1 050	158	89
Mashua	1102909000 - HARINA DE CEREALES, EXCEPTO DE TRIGO O D			1 653	3 903	1 820
	0714909000 - LAS DEMÁS RAÍCES Y TUBÉRCULOS SIMILARES	3	874	1 230	1 348	486
	0714100000 - RAÍCES DE YUCA (MANDIOCA) FRESCAS, REFRI	81				263
	Resto		3	3 082	195	55
Arracacha	1005903000 - MAÍZ BLANCO GIGANTE (ZEA MAYS AMILÁCEA C					
	1904100000 - PRODUCTOS A BASE DE CEREALES, OBTENIDOS					
	Resto			0.10	757	1 029
Tumbo	0810909000 - LOS DEMÁS FRUTAS U OTROS FRUTOS FRESCOS		310		13	430
	Resto	1 666	11 785	729	945	51
Total		476 198 744	438 600 962	457 744 499	461 179 846	484 976 211

6. Table of Acronyms, Acronyms and Abbreviations

ADEX	Exporters Association
AGROIDEAS	Compensation Program for Competitiveness, MINAGRI
APEGA	Peruvian Association of Gastronomy
APTAE	Peruvian Association of Adventure Tourism and Ecotourism
BCRP	Banco Central de Reserva del Perú
CAF	Andean Development Corporation, today the Development Bank of Latin America
CAF	Development Bank of Latin America
CDB	Convention on Biological Diversity
CCL	Chamber of Commerce of Lima
CMMAD	World Commission on Environment and Development
CONAM	National Council of the Environment
EPANB	Strategy and National Action Plan on Diversity
EU	European Union
FOB	Free on Board
GEF	Biological Global Environment Fund (abbreviations for The Global Environment Facility)
GI	Geographical Indications
HACCP	Hazard analysis and critical control points
IDH	Índice de Desarrollo Humano
IIAP	Peruvian Amazon Research Institute
IPPN	Peruvian Institute of Natural Products
MINCETUR	Ministry of Foreign Trade and Tourism
MINAGRI	Ministerio de Agricultura y Riego
MINAM	Ministry of the Environment

PBA	Andean Biocommerce Project
PNPB	National Program for the Promotion of BioTrade
PNUMA	Programa de las Naciones Unidas para el Medio Ambiente
PRODUCE	Ministry of Production
PROMPERÚ	Commission for the Promotion of Peru for the Export and tourism
PYC	Principles and Criteria of BioTrade
RREE	Ministerio de Relaciones Exteriores
SIICEX	Sistema Integrado de Información de Comercio Exterior
SGCAN	General Secretariat of the Andean Community of Nations
SUNAT	Superintendencia Nacional de Aduanas y de Administración Tributaria
UEN	National Executing Unit of the project
UNCTAD	United Nations Conference on Trade and Development (acronyms for
UNALM	National Agricultural University La Molina
UNEP	United Nations Environment Program (abbreviations for United Nations Environment Program)
UPCH	Peruvian University Cayetano Heredia
WIPO	World Intellectual Property Organization
WTO	World Trade Organization