

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Humanities



Bachelor Thesis

**Foreign Trade – Case Study of Quinoa Export
from Bolivia to EU.**

Samir Eid Velasco

© 2022 CZU Prague

Declaration

I declare that I have worked on my bachelor thesis titled “Foreign Trade – Case Study of Quinoa Export from Bolivia to EU” by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break the copyright of any person.

In Prague on 15.03.22

Samir Eid Velasco

Acknowledgement

I would like to thank Ph.D. Inna Cabelková especially for the guidance, supervision, and feedback I have received. There will never be enough gratitude I can express to my family that have always had faith in me and supported me along the whole way.

Foreign Trade – Case Study of Quinoa Export from Bolivia to EU

Abstract

This bachelor thesis analyzes foreign trade in Bolivia, studying the exportation of quinoa from Bolivia to the European Union. The research includes a literature review and a practical part.

The literature review describes what foreign trade is, its importance, the most important theories and the advantages and disadvantages foreign trade presents.

The practical part includes an overview of the economy in Bolivia, quinoa production and exportation in the country, a description of the nutritional values of quinoa and also interviews with two persons that export quinoa to European countries.

Finally, after the theoretical and practical parts are written, the document will end with a conclusion given after analyzing all the information gathered.

Keywords: Foreign Trade, Bolivia, Quinoa, Export

Zahraniční obchod – případová studie exportu Quinoa z Bolívie do EU

Abstrakt

Tato bakalářská práce analyzuje zahraniční obchod v Bolívii se zaměřením na export quinoy z Bolívie do Evropské unie. Výzkum zahrnuje literární rešerši a praktickou část.

Literární přehled popisuje, co je zahraniční obchod, jeho význam, nejdůležitější teorie a výhody a nevýhody zahraničního obchodu.

Praktická část obsahuje přehled ekonomiky v Bolívii, výrobu a export quinoy v zemi, popis nutričních hodnot quinoy a také rozhovory se dvěma osobami, které vyvážejí quinou do evropských zemí.

Nakonec, po napsání teoretické a praktické části, bude dokument ukončen závěrem daným po analýze všech shromážděných informací.

Klíčová slova: Zahraniční obchod, Bolívie, Quinoa, Export

Table of Contents

1	Introduction.....	9
2	Objectives and methodology	10
2.1	Objectives	10
2.2	Methodology.....	10
3	Literature review.....	11
3.1	Foreign Trade.....	11
3.1.1	Introduction to Foreign Trade.....	11
3.1.2	Importance of Foreign Trade	12
3.2	Theories of foreign trade.....	14
3.2.1	Classical trade theories	14
3.2.2	Mercantilism	14
3.2.3	Absolute advantage.....	14
3.2.4	Comparative Advantage	14
3.2.5	Heckscher-Ohlin Theory (Factor Proportions Theory)	15
3.2.6	Modern trade theories	15
3.3	Types of Foreign Trade.....	18
3.4	Advantages.....	18
3.5	Disadvantages	20
4	Practical Part.....	21
4.1	Overview of the economy in Bolivia	21
4.2	Foreign trade in Bolivia	24
4.3	Quinoa: Ancient Superfood	27
4.3.1	Origin and Nutrition of Quinoa	27
4.4	Production and exportation of quinoa.....	29
4.5	Quinoa production in Bolivia	30
4.5.1	Development of quinoa in Bolivia.....	30
4.5.2	Exportation of quinoa to Europe.....	31
4.5.3	Production stages and Productive process of Quinoa	34
4.6	Institutions and Regulations of ecological certification of quinoa in Bolivia	37
4.6.1	Regulations of quinoa for the international market	38
4.6.2	Regulations of quinoa for local market.....	38
4.7	Impacts of the production and export of quinoa in Bolivia	39
4.8	Interviews.....	41
4.9	Output	45

5	Conclusion	46
6	References.....	48
7	Appendices.....	52

Table of figures

Figure 1 World Exports as % of GDP - Source "World Integrated Trade Solutions, 2020"	19
Figure 2 GDP growth (annual%) Bolivia - Source "The World Bank, 2021"	22
Figure 3 Bolivia: Growth rate of the real gross domestic product (GDP) from 2016 to 2026 - Source "Statista, 2019"	24
Figure 4 Bolivia Exports and Imports - Source "Ministry of Economy and Public Finance, 2019"	25
Figure 5 Quinoa nutritional facts - Source "HerbaZest, 2020"	29
Figure 6 Quinoa exporters - Source "ITC, 2020"	30
Figure 7 Import of quinoa from Peru, Bolivia and Ecuador in 2019 - Source "CBI, 2020"	31
Figure 8 European import value and volume of quinoa with non-European origin - Source "CBI, 2020"	32
Figure 9 Bolivia exports - Own creation - Source "INE, 2021"	34
Figure 10 Quinoa exports in Bolivia - Own creation	34
Figure 11 Quinoa production stages - Own creation - Source "SciELO, 2018"	35
Figure 12 Productive Chain of Ecological Quinoa - Own creation - Source "SciELO, 2018"	37
Figure 13 Production, consumption and export of quinoa - Source "ResearchGate, 2011"	40
Figure 14 Quinoa production and cultivated area for agricultural years - Source "Research Gate, 2007"	41

List of tables

Table 1 Nutritional value of quinoa seeds in different regions - Source "US National Library of Medicine National Institutes of Health"	54
---	----

1 Introduction

The concept of trade, which began with the method of exchange, has come to this day with the gradual development of the concept of purchase involving the purchase and selling of goods and services internationally, it is the result of what is known as Foreign Trade. (Bourchtein, 2011) Also known as international trade, foreign trade is about imports and exports between nations allowing them to expand markets for both goods and services that are not available for consumers in their own countries. Factors such as globalization and modern technologies are just some causes of the increase of Foreign Trade globally through the years. Foreign trade is important because it acts as a stimulator of economic growth, economic development, increasing government revenue, raising living standards and other aspects that will be detailed in the following lines.

Quinoa grains is one of the products that has been benefited from foreign trade as imports and exports have risen significantly in the last years. Regions such as United States and Europe are increasing their consumption of natural and organic products following the trend of people becoming more concerned about eating healthy diets. (Food and Agriculture Organization of the United Nations Regional Office for Latin America and the Caribbean, 2001) Quinoa is considered now a delicacy in international homes and restaurants because its flavor and nutritional value.

Bolivia, one of the biggest producers and exporters of quinoa, is also increasing its exports and has great opportunities to grow even more and supply the demand of international markets. (IBCE, 2010) Even though laws and policies in the country difficult local producers and companies to export and import due to bureaucracy in paperwork and requirement fulfills, the actual government has mentioned as one of their goals to help and incentive exportation of local products which will also have positive effects in the general economy.

2 Objectives and methodology

2.1 Objectives

The objective of this thesis is to analyze the exportation of quinoa from Bolivia. This document will also include a description of what the crop quinoa is and analyze the historical and actual situation of the exportation of this product from Bolivia to the world and more specifically to the EU due to its increase in demand as a result of the nutritional value and unique properties it has. The importance of foreign trade worldwide and in the Latin American country Bolivia will be mentioned as well the impacts the production of this crop has in the country.

2.2 Methodology

This thesis consists in two main parts which are the theoretical and the practical part. The theoretical part will include a literature review about the main concept of foreign trade, its importance, the different theories of Foreign Trade, types and the advantages and disadvantages. The practical part will give an overview of the crop Quinoa, mention its origin, the quinoa production in Bolivia and the actual situation of exportation of this crop to the European Union. In the second part of the document, the institutions and regulations of ecological certification to export quinoa from Bolivia will be mentioned and an interview with two exporters of Quinoa to countries in the EU.

Finally, after the theoretical and practical parts are written, the document will end with a conclusion given after analyzing all the information gathered.

3 Literature review

3.1 Foreign Trade

In order to know the concept of Foreign Trade better, we must first understand the concept of trade which is historically very old. Trade can be defined as the exchange of goods and services for another amount of money, good or service. The concept of trade was first a method of exchange which has changed over time to what we know as purchase. (Frachtbox team, 2020) Trade is a basic economic concept that involves the buying and selling of goods and services that is compensated by money or as it was mentioned before, sometimes trade is also the exchange between parties. According to Sherlock and Reuvid, “there are two basic types of trade between countries, the first in which the receiving country itself cannot produce the goods or provide the services in question, or where they do not have enough and the second, in which they have the capability of producing the goods or supplying the services, but still import them. (Sherlock & Reuvid , 2008)

3.1.1 Introduction to Foreign Trade

Foreign trade which is also called International trade is defined as “an exchange of capital, goods and services across international borders or territories” (Bourchtein, 2011) To understand better the definition, Prof. J.L. Hanson defines foreign trade as the exchange of different goods and services between countries. (Hanson, 1977) Foreign trade is about imports and exports between nations allowing them to expand markets for both goods and services that are not available for consumers in their own countries as it was mentioned before, so the ability of some countries to produce and export their products which other countries don’t have or can’t produce because the lack of any of the following like labor supply, resources, not adequate climate or soil and others are the reasons for international trade to occur. (IEDU Note, 2019)

Foreign trade differs from domestic trade because domestic or local purchases and sales are between people or companies in the same location which only involves trade regulations of one country. Despite, in international trade both buyers and sellers must be aware of the regulations of the two countries involved. International trade is mostly more expensive due to tariffs and taxes that both countries impose. (Tatum, n.d.) There are varieties such as import and export.

3.1.2 Importance of Foreign Trade

Foreign trade is essential for the world because goods and services are required to meet the needs of communities and every country depending on their geographic location and other characteristics either has the sufficient resources to produce those goods and services or doesn't. So, if a country doesn't have the resources to produce it needs the help of other country and buys from abroad nations. (Frachtbox team, 2020)

Foreign trade is important because it acts as a stimulator of economic growth, economic development, increasing government revenue, raising living standards and other aspects that will be detailed in the following lines.

- Stimulator of economic growth

There are economic, social, demographic and political factors that are necessary for a country to grow economically in a sustainable way:

In the words of Adam Smith, the measure that indicates whether or not a country is rich is attributed to GDP, and among the recommendations for increasing it, we have:

- Existence of markets and financial intermediaries, for the provision of resources to economic agents in the country.
- Attract investor confidence, with political stability and an orderly legislative framework that protect physical and intellectual property.
- Constant investment for the development of skills in human capital.
- Correct tax measures and regulations.
- Free trade and free movement of capital, since it will increase productivity and competition between companies. (Marco Sanjuan, 2018)

The role of exports to promote economic development has been the object of study at least since the 1950s, there has been a debate whether it is more convenient to have foreign sales or import substitution, and as a result of this study it was concluded that by promoting Foreign trade had an exchange of information in addition to helping to increase the total productivity of production factors and disseminating knowledge from more advanced companies (perhaps multinationals) to local small and medium-sized companies, among other benefits of this type of policy.

For example, Lawrence and Weinstein (1999) argue that the practice of protecting infant industries in order to promote the development of internationally competitive firms has not been effective in Japan. The study suggests that it would have been

beneficial for the development of that country to have established lower tariff rates, promoting a greater volume of imports, particularly during the period from 1964 to 1973. The idea that Japan's economic growth was promoted is also questioned. for the success of its exports. (Lawrence & Weinstein, 2017)

- **Optimum utilization of abundant resources**

As foreign trade leads to specialization because companies focus on a product itself, this helps to eliminate unproductive lines and avoid wasting resources, because having a clear objective of what is going to produce, a correct use is made of these and the continuous improvement of how to make the most of them. (IEDU Note, 2019)

- **Generates employment opportunities**

By increasing the mobility of labor and resources, there is a generation of jobs and opportunities, because the exchange of products between countries requires that this product must be sold, transported, packaged according to the specifications of each country among others and for all those actions are needed manpower. (IEDU Note, 2019)

- **Raises standard of living of people**

This point allows companies and people to access more products and services than those produced in their countries of origin. People having more choice opportunities can opt for high-quality products that solve people's daily problems and offers higher living standards increasing longevity and quality of life. (Paez, 2020)

- **Fluctuation in price level of commodities**

There are limitations in the availability of materials and foreign trade breaks down walls in order to give accessibility to countries in the acquisition of materials for their new products and opportunities for improvement which can be controlled in foreign trade. For example, if price of a specific material rises because the lack of the supply, the same can be imported to level down the price. Similarly, if price of a material falls due to increased supply in the domestic market, the excess can be exported to increase the price. (Paez, 2020)

3.2 Theories of foreign trade

The specialization of the countries is affirmed that it is promoted by international trade, because the countries manage to advance, in the first place, taking advantage of their resources, concentrating their efforts on what they can produce better. Then, having satisfied the local market for these products, they sell them to other countries, exchanging them for products that other countries work better, with greater efficiency.

3.2.1 Classical trade theories

3.2.2 Mercantilism

Mercantilism can be described as a theory of economics that regulates international trade by the government in terms of ensuring the wealth and power of the nation. The main idea of mercantilism that brought out Adam Smith is improving the country by limiting imports and endorsing exports.

The ideal model of mercantilism is when the government cooperates with merchants and gets rid of the deficit in trade, funds the military and national growth, securing and controlling policies for the protection of local enterprises. It is similar to “nationalism” in economics. By putting the focus solely on national growth mercantilism established monopolies, provided pensions, and tax-free status for local favorite authorized industries. It went all against the immigration of significant, well-educated labor, moreover capital, and mechanisms. (LaHaye, 2008)

3.2.3 Absolute advantage

This concept first introduced by Adam Smith in this book “An Inquiry into the Nature and causes of the Wealth of Nations”, he states that “in order to become rich, countries should specialize in producing the goods and services in which they have absolute advantage and engage in free trade with other countries to sell their goods.” (Smith, 2007), a country’s resources should be used in the best way in the production of goods and services in which they have a productivity advantage compared to other countries therefore their national wealth would be maximized. (Bondarenko, 2018)

3.2.4 Comparative Advantage

This economic theory developed in the 19th century by the British economist David Ricardo, “attributed the cause and benefits of international trade to the differences in the relative

opportunity costs (costs in terms of other goods given up) of producing the same commodities among countries.” (Encyclopaedia, 2018) In other words, the fact that one country could produce its goods and services more efficiently than others is not an argument against international trade, based on the labor theory of value. (Encyclopaedia, 2018)

3.2.5 Heckscher-Ohlin Theory (Factor Proportions Theory)

This theory was developed by the economist Bertil Ohlin, it states that countries export what they produce more efficiently and plentifully. It is referred to as a 2x2x2 model, it evaluates trade but more specifically the equilibrium of trade between two countries that have different natural resources and specialties. As an example, in this model, a country would export goods in which it has factors of production in abundance and import the goods that it can't produce. So, countries in which capital is plentiful and labor scarce, will export capital-intensive products and import labor intensive products while countries in which labor is relatively plentiful and capital scarce will tend to import capital intensive goods and export labor intensive products. The Heckscher-Ohlin theory, states that the most important is not the amount of capital but the amount of capital per worker. (The Editors of Encyclopaedia, 2020)

3.2.6 Modern trade theories

Some years after the previous mentioned theories were developed, some new and modern theories at the time appeared to give another point of view of international trade. This will be mentioned below.

- **Product life cycle theory**

This theory developed by Raymond Vernon in the 1960s says that products go through three stages when exposed to international markets. The cycle starts with the introduction of a new product, a corporation in a developed country will innovate a new product. In this case the market for the product will be small and sales will be low. The author states that innovative products are more likely to be created in a developed country because people there may have more disposable income to use on new products. As sales increase with time, the producer company may start to export the product to other developed countries to increase sales. The second stage, maturity starts when the product has firmly established in other developed nations, the producer will need to consider to open production plants in those countries to meet the demand. As the product is produced locally, labor and exports costs will decrease and revenue

will increase. At this stage, the product can be modified to adapt it if needed. In the third stage which is product standardization and streamlining of manufacturing, exports to less developed countries start to take place, competitive product offers saturate the market making the original idea of the product loses their competitive edge. At this point, the producer company has to focus in driving down the cost of the process to manufacture the product instead of adding new features, author LaMarco states that they do this by changing places of production to countries where the average income is less so they standardize manufacturing methods. (LaMarco, 2019)

- **Intra industrial Trade**

It is based on the exchange of similar products belonging to the same industry, in other words it refers to the import and export of the same type of goods or services.

The principles of this theory are based on:

- Economies specialize to take advantage of increasing returns.
- Its main objective is not focused on maintaining differences in local endowments.
- It allows countries to specialize in a limited variety of production and thus take advantage of increasing returns, based on economies of scale. (EAE Business School, 2021)

- **Economies of scale**

One of the major reasons for international trade to take place is the existence of economies of scale because it allows production of goods at larger scale to be achieved at lower cost. “When production within an industry has this characteristic, specialization and trade can result in improvements in world productive efficiency and welfare benefits that accrue to all trading countries.” (Suranovic, 2010) Economies of scale are considered as an advantage of trade because despite trade between countries does not depend on country differences under the assumption of economies of scale, it is important that countries could be identical in all respects. This model is often used to explain trade in developed economies such as United States, Japan and the European Union due to the similarity in technologies, endowments and to some extent similar preferences. “Using classical models of trade

(e.g., Ricardian, Heckscher-Ohlin), these countries would have little reason to engage in trade. Yet trade between the developed countries makes up a significant share of world trade. Economies of scale can provide an answer for this type of trade.” (Suranovic, 2010)

- **Imperfect Competition**

Because in the world companies are in constant competition, the situation is that there is no perfect competition, but imperfect.

When there is perfect competition, sellers cannot affect the market price so they face a horizontal demand curve. On the other hand, when imperfect competition occurs, sellers face a curve that goes downwards meaning that if a seller wants to increase the supply, the price will decrease. (Roldan, 2016)

Among the main imperfect powers, we have:

- Monopolistic competition
- Reciprocal dumping model
- Scale economics

- **Strategic Trade Policy**

“Strategic trade policy is defined as trade policy that conditions or alters a strategic relationship between firms, implying that strategic trade policy focuses primarily on trade policy in the presence of oligopoly.” (Brander, 1995) In other words, it is a government policy which attempts to shift excess profits in international markets characterized by being oligopolistic towards the home country firms. This policy may appear as subsidies, outright grants, promises to buy large volumes of production, loans at lower than market interest rates and others. For example, if there is a market with only several players which have positive profits, if each one wants to expand market share at the other’s expense, but one of them produces more, there is an incentive to produce less. Otherwise, production on average will increase having lower prices and lower profits as a result. (Brander, 1995)

- **Gravitational model of trade**

“The gravity model of international trade states that the volume of trade between two countries is proportional to their economic mass and a measure of their relative trade frictions”. (Baier & Standaert, 2020) This model has been the workhorse model of international trade for more than 50 years, although the initial empirical work using this model lacked sound theoretical aspects, developments have been very important in economy like specification can be derived from many models with varying assumptions about preferences, technology and market structure. In the new millennium, it has evolved significantly. “The flow of trade between two countries was posited to be proportional to the economic size of the trading partners and inversely related to their distance from each other. As formulated, the gravity equation of international trade could be rewritten as a log-linear empirical specification that could be easily estimated” (Baier & Standaert, 2020)

3.3 Types of Foreign Trade

Foreign trade variations consist of three concepts: import, export and transit trade which are described below.

- **Import:** Traffic of goods or services acquired by a country in another territory for use in the national territory.
- **Export:** Traffic of goods or services from one country to another to be consumed there.
- **Re-export:** Traffic of goods or services from one country to another that are imported previously, to be exported again. (Helpman, 1999)

3.4 Advantages

International trade had been of great advantage to many nations enable them to use what they have to get what they want in order to achieve meaningful a development and contributes to the growth of country’s economy because when the country exports, their currency value increases. (E Finance management, 2018)

WORLD COUNTRY GROWTH V/S WORLD GROWTH V/S GDP GROWTH

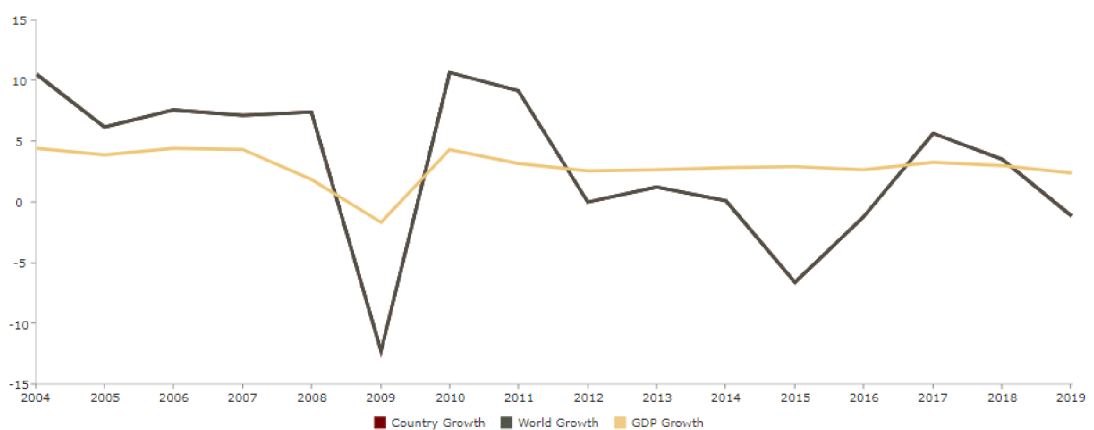


Figure 1 World Exports as % of GDP - Source "World Integrated Trade Solutions, 2020"

- **Higher level of competition with decreasing prices**

Consumers can be benefited from an increased level of competition because it will mean lower product prices and more options to choose. In this case, local businesses have almost no competitors and they can put high prices for their products, of course if competitors enter the market they are forced to lower their prices. (Knight, 2020)

- **Specialization and economies of scale**

If a country wants to sell its goods in the international market, it will have to produce more than what is needed to meet the domestic demand. So, producing higher volume leads to economies of scale, meaning the cost of producing each item is reduced. Due to another factor of modern trade theory, the focus furthermore goes on economies of scale. According to this point, the importance of a country's product specialization is not that significant as the persuasion of specialization.

For instance, the most popular producer of electronics - Apple. Apple's products are being designed in the United States but engage the best-specialized manufacturers around the world to produce certain components of the upcoming production. As a great example here will be Foxconn (Hon Hai Precision Industry Co.) is the longest-running partner of Apple. It assembles the majority of Apple's iPhones. Although Foxconn is based in China, it also maintains numerous factories all over the world. In countries such as South Korea, Malaysia, Czech Republic, Singapore, etc.

Furthermore, explaining economies of scale we can add that when a country wants to sell the goods and services they produce in the international market, they need to

produce greater volumes to meet both domestic and international demand, this will lead to economies of scale because they will buy more materials and reduce costs. (E Finance management, 2018)

- **Competition**

Competition Due to the great development of international trade, there also comes great competition among countries in the international market. Now suppliers have to make sure they are competitive enough by securing their quality and prices. The result of competition is what is called the global supply chains, a development that has revolutionized how we produce, innovate, market, and deliver to customers. The global supply chains are a result of the evolution from the ground up, self-organizing competition between companies across borders. (Hedrick-Wong, 2018)

- **Transfer of knowledge and technology**

International trade allows firms to get access to industry experts and new technologies around the world, especially in countries where there are not using the ultimate technologies can be benefited from developed countries that will bring it and teach them how to use. It is also easier with globalization and foreign trade for companies to hire experts and qualified people. Companies acquiring knowledge and technology become more competitive compared to other companies in the area which is also an advantage. (Knight, 2020)

3.5 Disadvantages

- **Costs derived from licenses and other regulations**

Selling or buying goods in international markets involves laws and regulations that need to be completed. Some companies for example choose to buy materials from other countries rather than de domestic market due to better prices but it Is important to know that licenses and regulations might mean time, costs and paperwork. (E Finance management, 2018)

- **Startups difficulties**

Small local companies with limited resources can be negatively affected by big international companies that are able to expand their economic territory. Their capability to compete is limited and with time they can go out of business due their

limitations in production, higher production costs because bigger companies have economies of scale and limited financial resources. (Knight, 2020)

- **Cultural differences**

There could be difficulties about cultural differences, sometimes companies that enter in new markets may have difficulties adapting their product to clients even some companies change or add certain features to their products in order to reach consumers. Another problem may be if two countries had problems in the past and their cultural values are different, they may not be able to establish fair trading agreements. (Knight, 2020)

4 Practical Part

4.1 Overview of the economy in Bolivia

Bolivia is a landlocked country in west-central South America, it borders Argentina, Brazil, Chile, Paraguay and Peru. The country occupies an area of 1.098.581 km², it is about twice the size of Spain. The region was once part of the ancient Inca Empire, actually it has a population of 11.8 million inhabitants, indigenous people make up about two-thirds of the population and the spoken language officially is Spanish. (Delso, 2021)

I will give a general overview of the economic situation of the country. It is important to mention that Bolivia is a country very rich in natural resources with strong growth attributed to captive markets for natural gas exports to Argentina and Brazil. Back in the 1990s, following an economic crisis during the 1980s, reforms spurred private investment, stimulated economic growth and cut poverty rates. Years after, between 2003 and 2005 the situation was characterized by racial tensions, political instability and violent protests against plans to export the new discovered natural gas reserves to large markets in the Northern Hemisphere. In 2005 and 2006, new laws were approved that imposed higher hydrocarbon royalties and foreign firms then operating under risk-sharing contracts were forced to surrender all to the national energy company. Between 2010 and 2013, material prices were higher than previous years which caused high commodity GDP figures to grow 6.8% in 2013 and 5.4% in 2014 achieving the highest GDP ever recorded in the country as the following chart shows. (Factbook, 2020)

GDP Bolivia

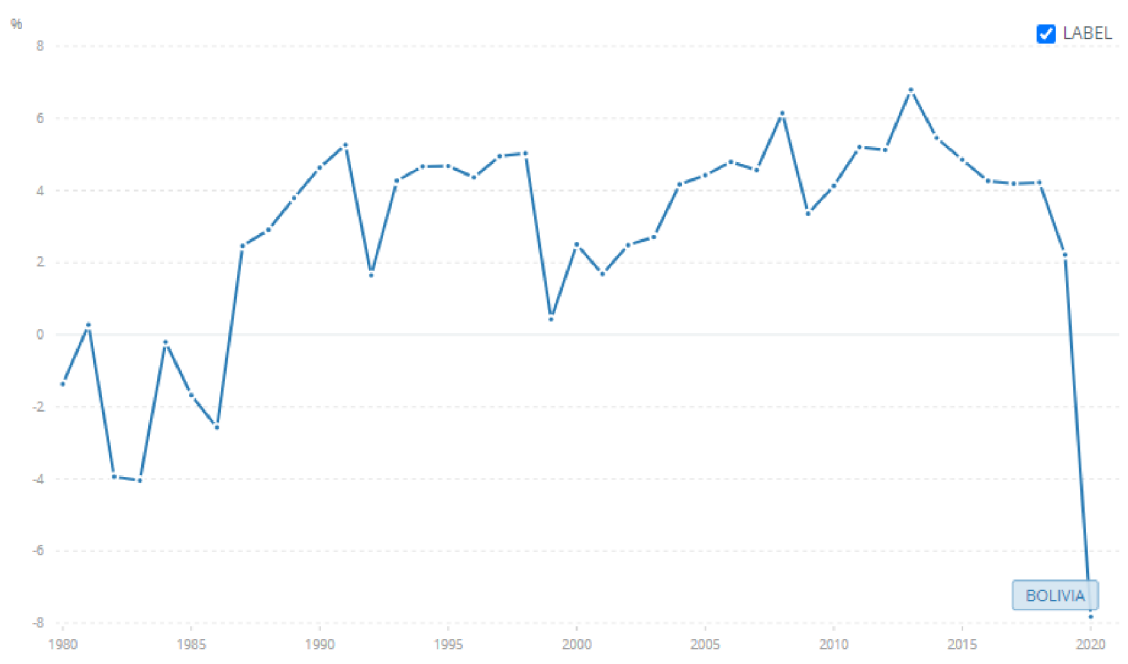


Figure 2 GDP growth (annual%) Bolivia - Source "The World Bank, 2021"

In 2014, oil prices decreased, and downward pressure was exerted on the price Bolivia receives exported gas and resulted in lower GDP growth rates (4.9% in 2015 and 4.3% in 2016) causing losses in government revenue as well as fiscal and trade deficits. After the commodities boom ended in 2014, the country resorted to high public spending and growing domestic credit to keep high economic growth. These measures had a negative effect increasing public debt, reduction of international reserves and the accumulated fiscal savings. So, a lack of foreign investment in the key sectors which are mining, and hydrocarbons added to social conflicts pose difficult challenges in the Bolivian economy. In 2015, the government expanded efforts to court international investment, boost the national energy production capacity and passed an investment law promising not to nationalize industries like years before. In the year 2016, national government approved a plan called National Economic and Social Development Plan which had as an objective to reduce poverty. (Index Mundi, n.d.)

Since 2016, GDP remained stable (4.3% in 2016, 4.2% in 2017 and 4.2 in 2018) but years after the national economy suffered decreases reaching 2.2% in 2019. Political instability again was the main characteristic for the years 2019 and 2020 due to social protests against the constitutional reforms after losing a re-election vote for President Morales to continue

governing the country. In 2019, president Morales resigned to the power and a constitutional president was designed, after the new transition government called to elections in 2020. (Index Mundi, s.f.) The Covid-19 pandemic has plunged the economy into a deep recession that led to rise levels of poverty. Local authorities gave different economic initiatives to protect the most vulnerable population, but this health crisis exposed several structural problems like poor preparation of the health system, insufficient macroeconomic buffers, very high labor informality and lack of social protection programs. In 2020 President Arce was elected returning to the same political party of Morales, they face the challenges to contain new waves of infection, accelerate vaccination and promote a recovery in economic activity and employment. Almost all economic sectors were negatively affected by the pandemic so 2021 is a year of trying to recover and survival for lots of private companies due to their minimum sales in 2020 after lockdowns and restrictions. (Index Mundi, s.f.)

In the following chart, the expected growth rate for next years can be seen.

Bolivia: Growth rate of the real gross domestic product (GDP) from 2016 to 2026

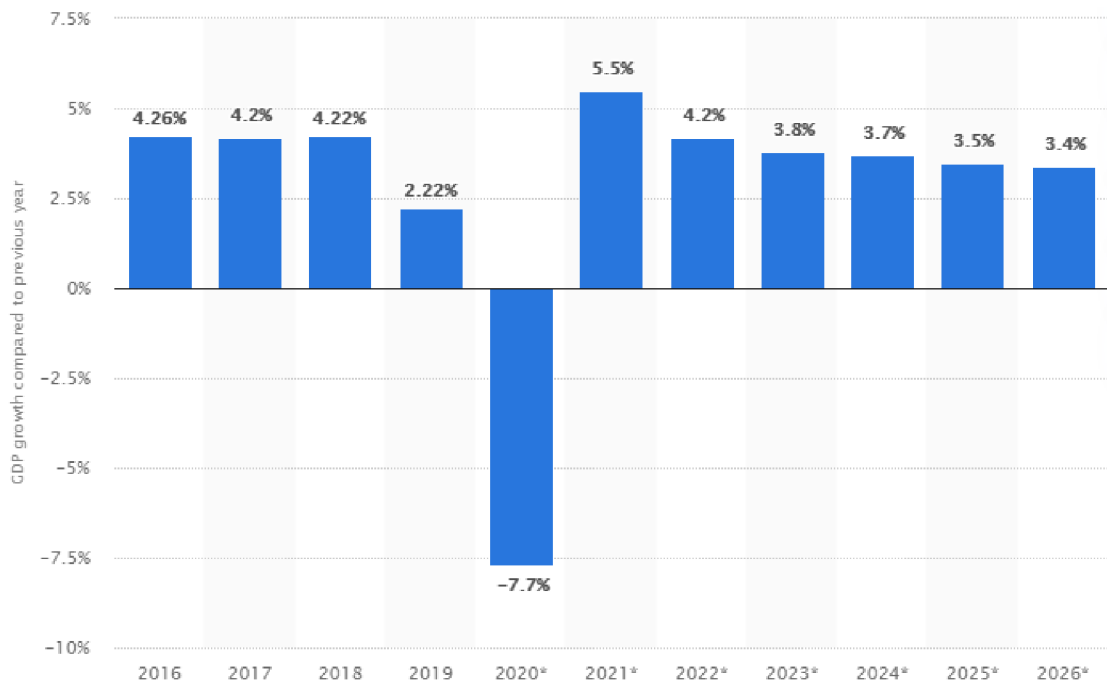


Figure 3 Bolivia: Growth rate of the real gross domestic product (GDP) from 2016 to 2026 - Source "Statista, 2019"

4.2 Foreign trade in Bolivia

The Observatory of Economic Complexity states that in June 2021 Bolivia exported \$859M and imported \$746M, resulting in a positive trade balance of \$114M. From June 2020 to June 2021 the exports of Bolivia had an increase of 53.4% (\$229M) meaning from \$560M to \$859M, while imports had also an increase of 42.4% (\$222M) from \$524M to \$746M. (Observatory of Economic Complexity, 2021)

Bolivia mainly exports natural gas, gold, zinc ores and soybeans. As it can be seen in the chart below, from 2010 until 2014 foreign trade in the country increased significantly almost doubling figures. Similar to what happened with the economy in general in the country when GDP figures in 2013 reached the highest number in decades which almost 7%. 2014 was a difficult year due to the fall in commodity prices all over the world which affected also Bolivia. (INE, 2021)

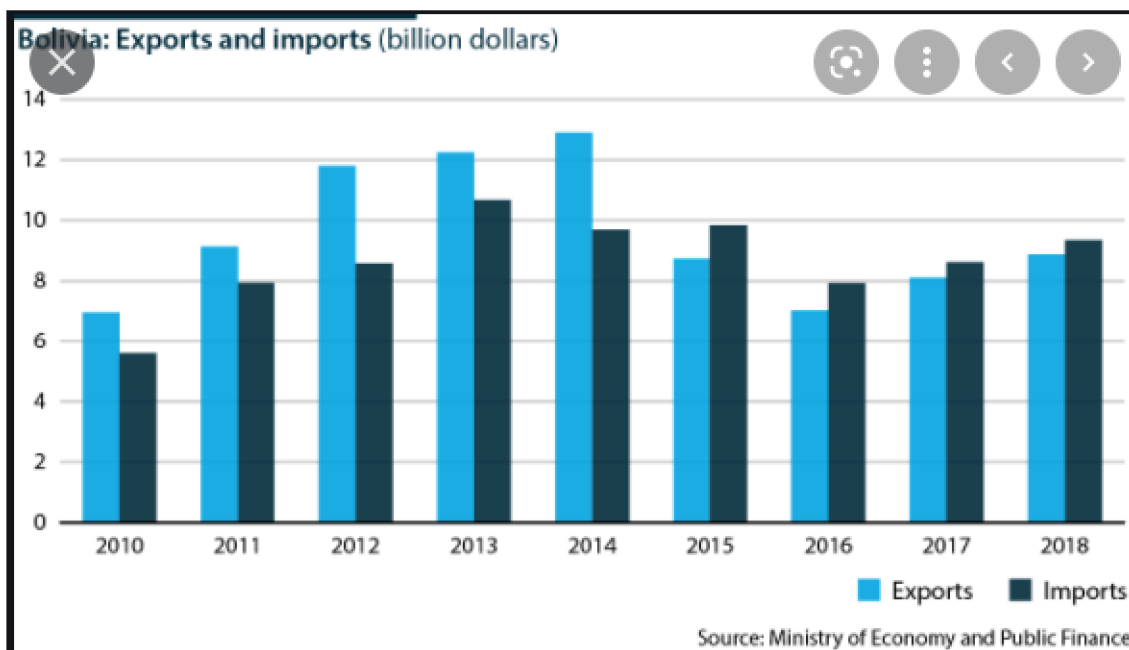


Figure 4 Bolivia Exports and Imports - Source "Ministry of Economy and Public Finance, 2019"

Exports and imports in Bolivia decreased in 2015, very similar pattern to the GDP which decreased from 7 in 2013 to 5.46 in 2014 and 4.9 in 2015. Exports were affected negatively after nine years of constant growth, in 2015 they decreased 32% compared to 2014. The most affected sectors in the country were hydrocarbons, minerals and non-traditional products as well as natural gas, all affected by the fall of international prices. Starting in 2017, imports and exports started to recover increasing almost 7.9%. (Framework, 2019) "The last years haven't been ideal for Bolivia's economy, it still lacks economic diversification, poverty even now is an important problem in the country, the decrease in demand of natural gas from Argentina and Brazil, political instability and the Covid-19 pandemic are the most important reasons of the actual situation of the country". (Lloyds Bank trade, 2020)

It is important to mention the main and strategic objectives of the Bolivian Vice-Ministry of Commerce because they give an idea of what the actual government aims are related to foreign trade in the country. The functions and powers included in this article available at the Bolivian Foreign Ministry website are described in the appendix.

- Objective: "With the vision of changing the Primary Exporting Pattern, the economic and commercial insertion of Bolivia in the international arena, this Vice Ministry Negotiates and Renegotiates Trade Agreements within the framework of the Political

Constitution of the State, based on the principles of Complementarity and Solidarity. Likewise, it promotes a deeper integration that transcends commercial matters, towards the convergence of integration processes in the region, promotes the commercial promotion of the Bolivian exportable offer and contributes to the facilitation of trade to turn our country into the logistics hub of the foreign trade of the region”. (Ministerio de Relaciones Exteriores, 2016)

- Strategic objective: “Strengthen integration processes, promoting national interests, in search of better conditions in the social, commercial, economic and physical infrastructure fields for Bolivia through the negotiation and renegotiation of trade and investment agreements, as well as the commercial promotion of new and alternative products with high added value, under the principles of the New Political Constitution of the Plurinational State of Bolivia”. (Ministerio de Relaciones Exteriores, 2016)

Bolivia is a member of various trade agreements that helps it to stimulate the business and economic growth of the country. The following trades are described below.

- **World Trade Organization**

Bolivia is a member of the World Trade Organization (WTO) since it was created in 1995, this is a global international organization that deals with organization and rules between countries. The objective of this organization is to help countries enhance their trade activities in order to increase imports and exports, for example lowering trade costs for developing countries like Bolivia. (International Trade Experts, 2020)

- **Mercosur trade relations**

The Mercosur trade bloc is an alliance founded in 1991 by Argentina, Brazil, Paraguay and Uruguay. Later other countries like Bolivia, Venezuela, Colombia, Chile, Ecuador, Peru, Guyana and Suriname were included. This alliance was created to stimulate investments, production and trade between members under the creation of a free trade environment policy. The creation of this trade bloc is a key contributor to economy in most of the member countries and of course Bolivia, is allows to gain preferential market access and expand their market also they obtain valuable tariff privileges as most of the member countries are excluded from import or export tariffs. (International Trade Experts, 2020)

- **The Andean Community of Nations**

On May, 1969, Bolivia, Colombia, Chile, Ecuador and Peru signed the Cartagena Agreement with the aim of improving the standard of living of its population through economic, social corporation and integration. Actually this agreement is called the Andean Community of Nations (CAN). It remains important because it intends to achieve “a comprehensive, balanced and developed environment, through greater regional integration.” (International Trade Experts, 2020)

4.3 Quinoa: Ancient Superfood

4.3.1 Origin and Nutrition of Quinoa

Quinoa is an Andean plant originated in the area of Lake Titicaca in Peru and Bolivia, cold areas in both south American countries. This crop which is called “quinua” in Bolivia, was cultivated and used by pre-Columbian civilizations and was replaced by cereals when the Spanish arrived although it was a local basic food at the time. There are discoveries of quinoa in tombs of Tarapacá in Chile and different regions of Peru, but at the time the Spanish arrived quinoa was already well developed in technological terms and was distributed inside and out the Inca territory. The first Spaniard that noted the cultivation of quinoa was Pedro de Valdivia who noticed the planted crops around Concepcion in Bolivia. At the time, the Spanish Renaissance poet Garcilaso de la Vega described quinoa as one of the second grains cultivated on the face of the earth, somewhat resembling millet or short-grain rice. He also tells that the first shipment of seeds that arrived to Europe couldn't be used because they were unable to germinate due to the high humidity of the sea voyage. (Food and Agriculture Organization of the United Nations Regional Office for Latin America and the Caribbean, 2001)

Before quinoa was cultivated as a crop as we know nowadays, wild quinoa was first used as a source of food from its leaves and seeds. There is also evidence that the Tiahuanaco culture used it on pottery. This crop has undergone a wide different range of morphological changed during its domestication and as a result of human activity. This changes mean an increase in size of the stem and seed, loss of seed dispersal and higher levels of pigmentation. “During domestication the Andean populations no doubt selected genotypes according to use and tolerance to adverse biotic and abiotic factors, resulting in today's plants and ecotypes with their different characteristics, such as "Chullpi" for soups, "Pasankalla" for toasting,

"Coytos" for flour, "Reales" for "pissara" or grains, "Utusaya" to resist salinity, "Witullas" and "Achachinos" to resist cold, "Kcancollas" to resist drought, "Quellus" or yellow seed for high yield, "Chewecas" to resist excessive humidity, "Ayaras" for nutritional value (high balance of essential amino acids and proteins), and "Ratuquis" for early growth. (Food and Agriculture Organization of the United Nations Regional Office for Latin America and the Caribbean, 2001)

Quinoa is known for its exceptional nutritional value which relies on its balanced composition of high protein, amino acids, minerals, fiber and minor compounds such as antioxidants and vitamins. It is important to mention that it does not contain gluten so it is suitable for patients with gluten related disorders or celiac. There are some genetic and environmental factors that may affect the nutritional value of quinoa, its cultivation altitude ranges from sea level to 4000 m high in areas from Colombia to Chile in its origins. “This variability in cultivation location and altitude, as well as rainfall regimes, has led to a high biodiversity of quinoa species, given that growing conditions are different for each location and thus plant adaptation was required. Moreover, now quinoa breeding programs are designed to develop new yield varieties that have desirable nutritional properties that are better adapted to several agroecological areas and more environmentally friendly. Emphasis is placed on the consumer markets—namely rich westernized countries—as quinoa has gained recent attention as a ‘superfood’”. (Angeli , et al., 2020)

In the figure below, the quinoa nutritional facts are shown:

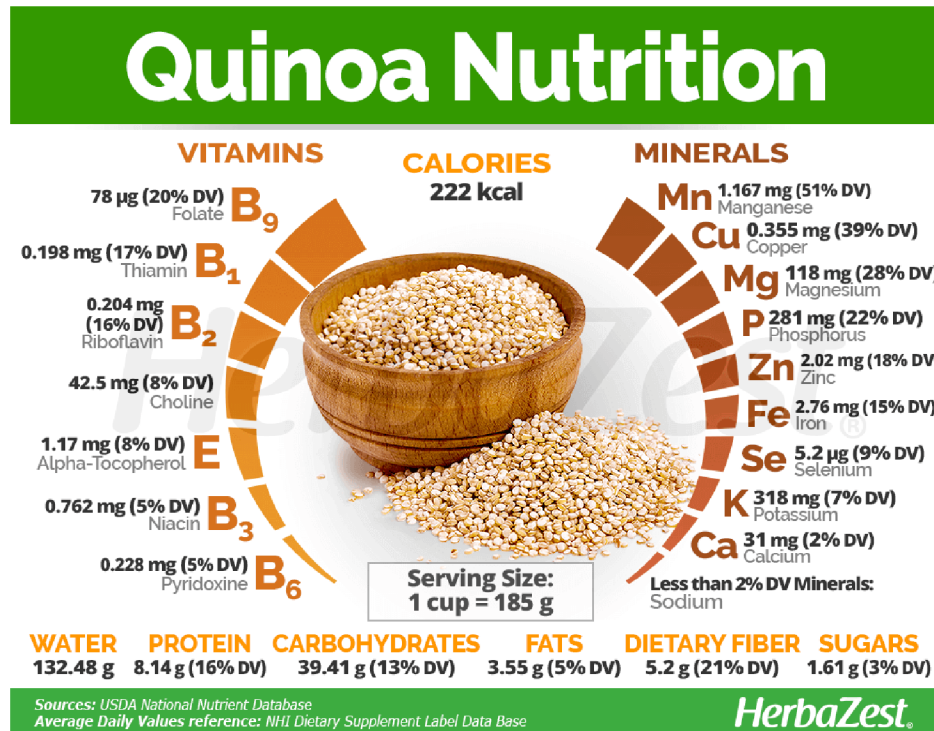


Figure 5 Quinoa nutritional facts - Source "HerbaZest, 2020"

4.4 Production and exportation of quinoa

As it has been mentioned previously, the quinoa crop is a vital food component across in Latin America and in the last years it is expanding to other continents to. Not only the edible seeds of the plant, the flower, leaves and stems are all often used now in traditional dishes around the world. (IBCE, 2010) The grain is commonly used in preparation of foods such as soups, main dishes, baked goods and beverages. For example, at the south of Altiplano, quinoa leaves are used in a soup 'yuyu', and other festive foods during carnivals and other celebratory events. Moreover, the crop is known to have medicinal usage, such as in bone fracture treatments and various illnesses. Peru and Bolivia, are the two main producers and exporters of quinoa, and in 2008 both cultivators contributed to approximately 90% of global quinoa production. Other important producers of quinoa in the world are Spain, Netherlands, Canada, United States and Ecuador. (Fundacion Proinpa, 2014)

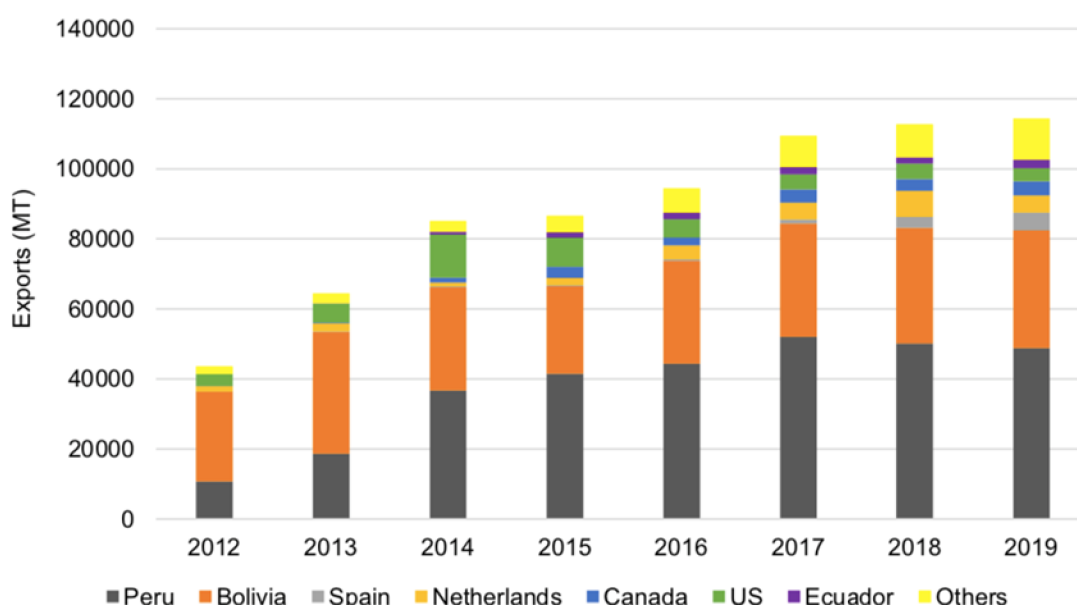


Figure 6 Quinoa exporters - Source "ITC, 2020"

4.5 Quinoa production in Bolivia

In this part of the thesis, I will give an historical overview of the production of quinoa in Bolivia, also mention the productive chain and production process of quinoa, finally talk about the actual situation of exports of quinoa in the country.

4.5.1 Development of quinoa in Bolivia

Quinoa, a small cereal that grows in the Andean area of Bolivia since thousands of years ago, became known in the decade of the nineties. Actually, quinoa is well known almost as a delicacy in restaurants and homes around the world also it has become a high demand product because of its nutritional benefits. Just to mention a fact, quinoa is used in the top 50 vegetarian restaurants in Europe where they offer the grain in exotic dishes. Quinoa is intended for markets where they are interested in food health adding its good taste and versatility to eat it in different ways. In Bolivia quinoa was traditionally consumed only in addition to soups which are called "laguas" but now it is enjoyed in many ways, with roasted meats, as a cereal with sugar and cinnamon and even as nutritional shakes in the mornings. The consumption of this product in Bolivia is appreciated as a food value and is still one of the main components of the families most consumed products. (IBCE, 2010)

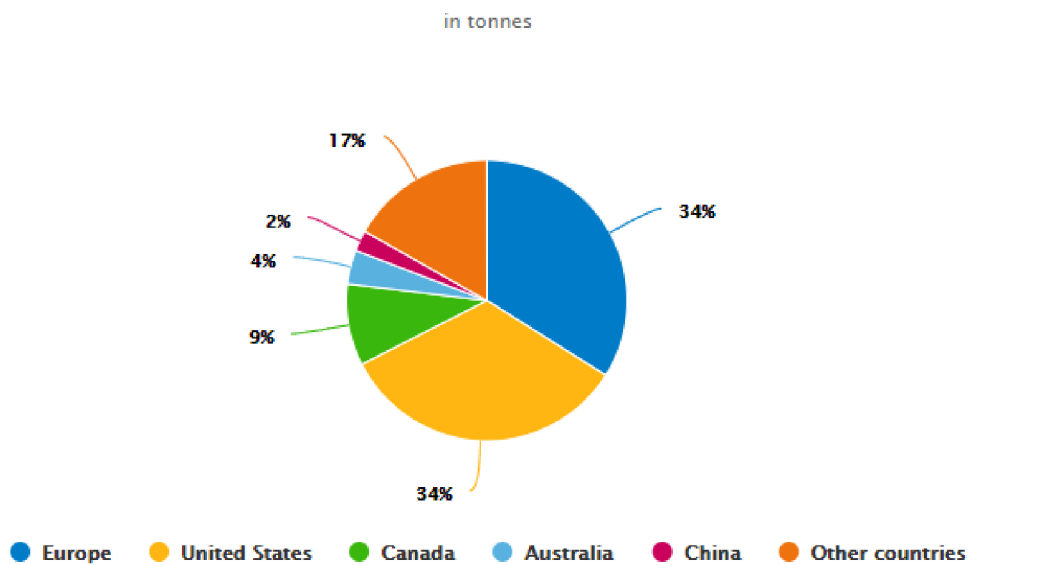
Quinoa in the Bolivian Altiplano is comprised of four varieties, three groups of varieties or 17 races. Its vegetative period varies between 150 and 240 days with a plasticity of adaptation to different conditions Environmental. The different varieties show a relative

indifference to photo period and altitude. They can cultivate from sea level to 3,900 m. Tolerate soils in a wide range of pH, from 6 to 8.5. Royal quinoa is the most sought after and sought after in the markets due to the large size of their grain. It is relatively resistant to frost and periods of drought, which facilitates its cultivation in the harsh climatic conditions of the Plateau. The real quinoa grain has a high saponin content that gives it a very flavor bitter and must be removed before its consumption increasing the cost of your prosecution. However, this high saponin content creates some protection of grain against the attack of pests. (IBCE, 2010)

4.5.2 Exportation of quinoa to Europe

United States and Europe have been the largest buyers of quinoa in the last years as it can be seen in the following chart and according to the CBI Ministry of Foreign Affairs in 2020, Europe is now the largest quinoa buying region in the world. Besides, it offers future growth for quinoa and a stable demand. Europe imports quinoa from Peru, Bolivia and Ecuador being roughly 1-3 of the total import from these countries. (CBI, 2020)

Figure 1: Import of quinoa from Peru, Bolivia and Ecuador in 2019



*other countries is calculated as export from Peru/Bolivia/Ecuador minus the import of the mentioned countries

Figure 7 Import of quinoa from Peru, Bolivia and Ecuador in 2019 - Source "CBI, 2020"

The report assures that Europe has a stable and growing import of quinoa despite fluctuations in supply and trade prices, volumes have been stable in the last five years with a minimum variation in 2018. In 2021, when quinoa crop obtained its own statistical international code

(100850) Europe imported less than six thousand tons but in 2019 import reached twenty-eight thousand tons.

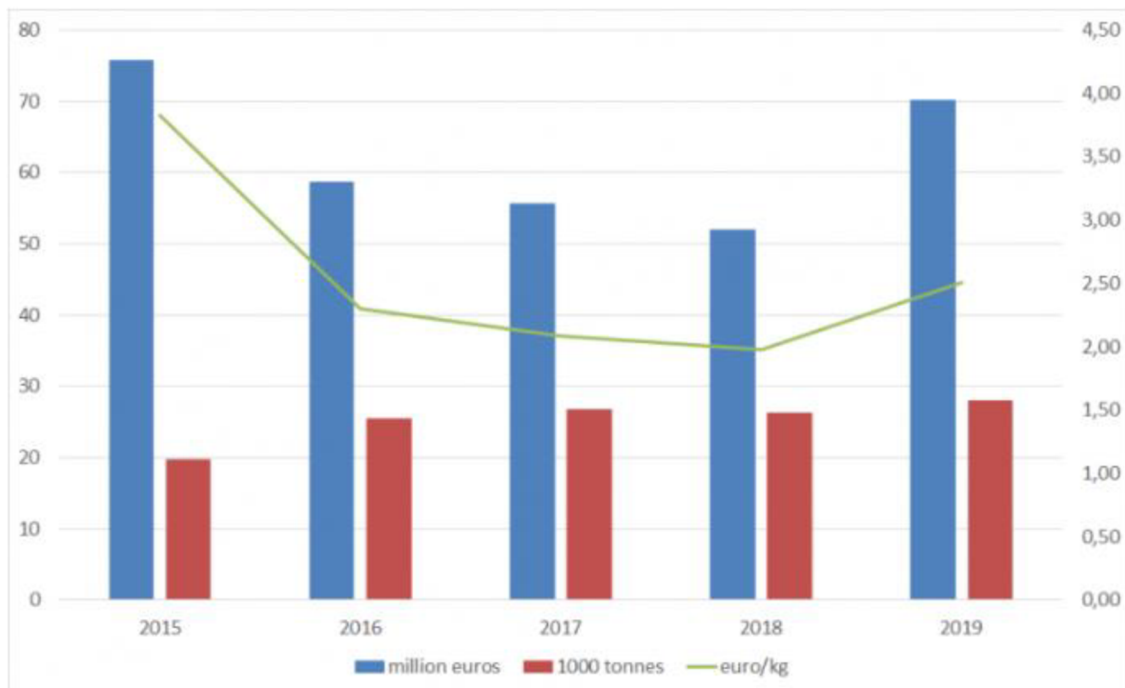


Figure 8 European import value and volume of quinoa with non-European origin - Source "CBI, 2020"

In the western region of Europe, quinoa has become a common grain which consumption is increasing incorporating in European diets. The most significant growth referring to local production of quinoa is in small countries like Slovenia, Lithuania, Greece, Czech Republic and Poland but part of the quinoa in these countries is not supplied directly from origin but through other traders in Europe, this is a good indicator that the European market for this crop has growing potential. The main consumer markets are France, Germany and the United Kingdom, The Netherlands and Belgium act as important logistical hubs for distribution and Spain combines production and re-exportation. (CBI, 2020)

In the last years, awareness of a healthy diet consumption has increased which contributes to the growing interest in the search for nutritious organic food like quinoa that has several benefits. Quinoa is not the only “new” healthy grain in the market but it is considered as a gluten free and vegan market important option. Latest, the Covid-19 pandemic is being used to promote plant based consumption.

Bolivia differentiates its offer to international markets with the “Royal Quinoa” variety, a product superior in quality and size so this is an advantage for the country to promote the

product which is cultivated in the southern region of Bolivia denominated Altiplano which has unique climate and soil conditions that help grow quinoa. One of the companies that is succeeding presenting quinoa products in Europe is the Bolivian “Coronilla Company” offering pastas and snacks made from quinoa. (CBI, 2020)

In the last report of IBCE (Bolivian Institute of Foreign Trade), quinoa is one of the top non-traditional most important export products. Products mentioned are also soya cake, crude soybean oil, jewelry, shelled Brazil nuts, quinoa, bovine meat, woods, sugar, bananas, milk, beans, coffee and cocoa. The agricultural trade balance has a surplus of almost 700 million due to the fact that the sector continued working during the Covid-19 pandemic. So, Bolivia is number 5 in the top 10 of non-traditional products exported as it can be seen in the following chart. The countries to which this product is exported to are United States (48%), Germany (9.6%), The Netherlands (8%) followed by Canada (7.7%), France (6.6%) and other countries that represent 19%. (CBI, 2020)

Data from INE, the National Statistics Institute, demonstrate that as mentioned before Exports in the country increased significantly between 2010 and 2014, in 2015 exports suffered a drop afterwards and from 2021 exports are expected to recover increasing year by year. Quinoa exports trends are the same. Using the linear regression model I estimated the total exports and quinoa exports in Bolivia for future 5 years, this numbers indicate that in 2025 quinoa exports will reach the highest point recorded in 2014 (1.5%). In conclusion, exports in the country are expected to grow significantly every year and quinoa has many opportunities to grow also adding the growing consumption tendencies in the world but mostly in European markets. (CBI, 2020)

Bolivia Exports (in million dollars)				
Time series	Year	Total Exports	Quinoa Exports	% quinoa exports from total exports
0	2010	6966.1	46.6	0.7%
1	2011	9145.8	63.4	0.7%
2	2012	12606.8	79.9	0.6%
3	2013	12251.7	153.3	1.3%
4	2014	12899.1	196.6	1.5%
5	2015	8737.1	107.7	1.2%
6	2016	7126.3	81.4	1.1%
7	2017	8223.1	74.5	0.9%
8	2018	9014.7	81.0	0.9%
9	2019	8795.9	90.7	1.0%
10	2020	6915.3	92.4	1.3%
11	2021	7902.1	100.8	1.3%
12	2022	7663.4	101.4	1.3%
13	2023	7424.6	102.0	1.4%
14	2024	7185.9	102.7	1.4%
15	2025	6947.2	103.3	1.5%
16	2026	6708.5	103.9	1.5%

Figure 9 Bolivia exports - Own creation - Source "INE, 2021"

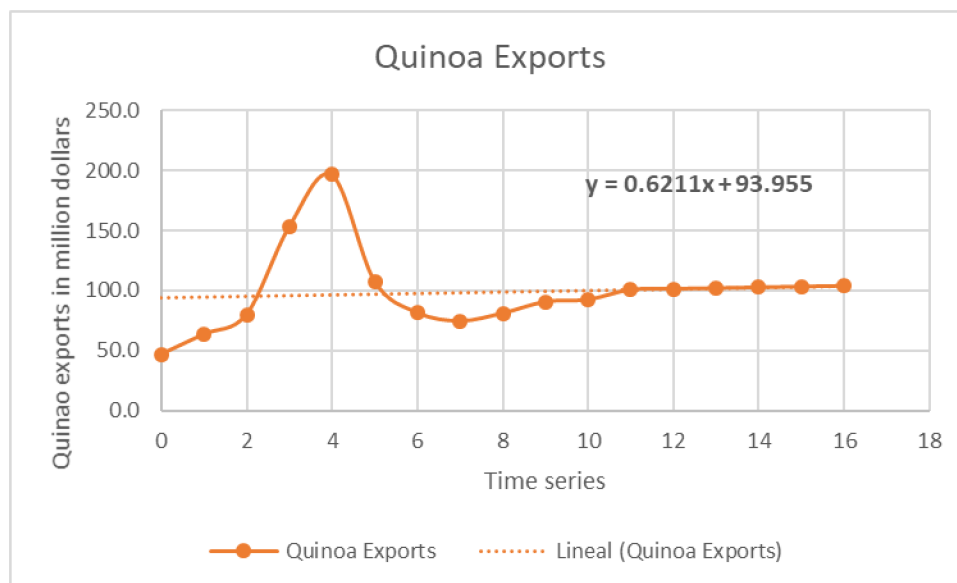


Figure 10 Quinoa exports in Bolivia - Own creation

4.5.3 Production stages and Productive process of Quinoa

The issue of quinoa is of interest to small producers that are part of the production chain, although in a reduced market. There are producers who, at the same time, are collectors. Then there are the intermediaries in the fairs. State and private certifiers are also part of the production chain, which validate the quality of the grain and certify the product. It is

important to identify that a production chain encompasses concepts such as: production, processing, certification, promotion and marketing; and that each one is related to the others to bring the quinoa to the final consumer. (Duran Olivares, 2019)

- **Quinoa production stages**

The existence of four stages that quinoa production goes through was identified. The first is made up of traditional cultivation, where producers came, in some cases, to offerings. Del Castillo and Bosque mention that the reading of the position of the stars served to prevent disasters in crops. The second stage is the implementation of innovative technologies for producers, such as the disc plow and the tractor, leaving traditional production behind. A third stage is constituted by the awareness of the quinoa producers. However, due to the demand for organic quinoa, producers have been forced to return to the first stage; But this time, each producer takes into account that if he wants to sell and export quinoa, he has to cultivate properly.

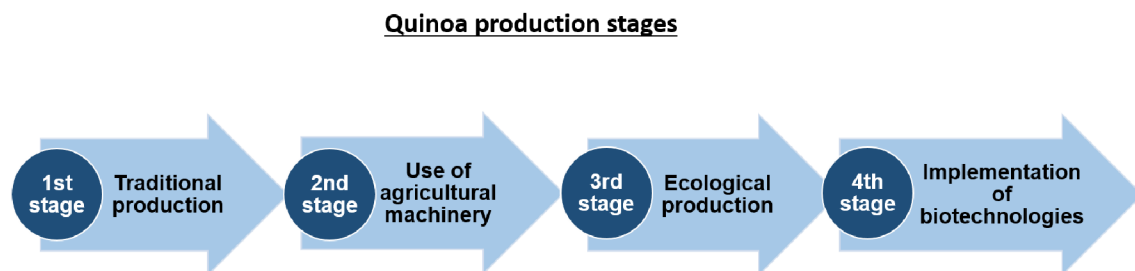


Figure 11 Quinoa production stages - Own creation - Source "Scielo, 2018"

The producer avoids all types of contact with toxic agents, agrochemicals, fungicides, among others, because organic production is subject to regulations that indicate compliance with caring for the environment, including: a) no use of agrochemicals, b) crop rotation, c) rest of the cultivation areas¹², and d) no use of machinery (disk plow) to remove the topsoil. Thus, the *quinuero producer* (as it is called in Latin America) has to comply with these ecological production criteria so that his cultivation is considered as such. In the last stage, new forms of organic production have emerged, but producers are afraid to implement modern technology in quinoa crops.

Organic production has come to specialize producers, who now prepare bio-inputs and adapt tools for sowing, harvesting and post-harvesting. This form of production is appreciated in

the international market, but the same does not happen at the national or local level. Producers also offer quinoa to intermediaries by rescuing the grain. (Duran Olivares, 2019)

- **Productive process of quinoa**

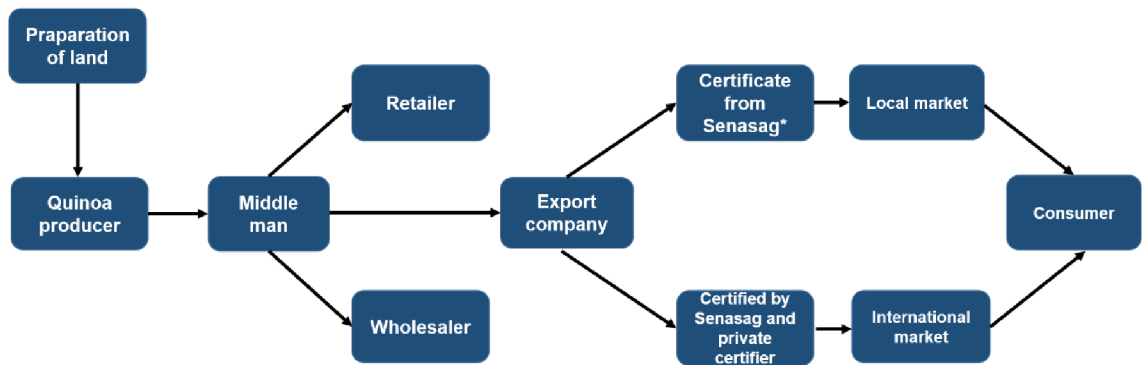
In relation to the production conditions, the quinoa grain was the main food of the cultures of the Andes (Rojas, 2011). Over the years, producers have implemented new machinery for sowing and harvesting the grain. Authors point out that the disc plow was one of the tools that was implemented and that, later, it caused the wear of the land. Later, producers introduced the chisel plow. Currently, producers are learning about new technological implements of a biological nature. Thus, quinoa production articulates small producers against producers who modernize their machinery, make production more technical and enter the market as intermediaries.

The European organic market has defined standards. The cultivation in the organic market is free of agrochemicals. The products are grown under the sustainable system, which takes care of the environment and the health of the consumer. For this reason, there are public and private institutions that verify and validate quinoa for its commercialization. (Duran Olivares, 2019)

- **Productive Chain of Ecological Quinoa**

The authors Tomta and Chiatchoua, point out that the production chain refers to all the stages included in the elaboration, distribution and commercialization of a good or service until its final consumption. Its main objective is to locate the companies, the institutions, the operation, the dimensions and negotiation capacities, the technologies, the production relations and the power relations in the determination of prices.

Productive Chain of Ecological Quinoa



*Senasag is the name of the National Service of Agricultural Health and Food Safety

Figure 12 Productive Chain of Ecological Quinoa - Own creation - Source "SciELO, 2018"

Institutions (public and private) are part of the production chain process. For the circulation of grain in the international market, private certifiers verify the quality of the product. The crops that circulate within the organic market are free of agrochemicals and the producers take care of the environment as well as the health of the final consumer. The purpose is to expand the consumption of organic quinoa nationally and internationally promoting the grain with the Bolivian seal. (Duran Olivares, 2019)

4.6 Institutions and Regulations of ecological certification of quinoa in Bolivia

The circulation of products in the organic market in Bolivia requires certification as an organic crop, which is based on international standards. In 1996, Bolicert¹ was created, promoted by the Association of Organizations of Ecological Producers of Bolivia (AOPEB²) Just nine years later, an institution that controls, validates and certifies organic products at the national level, the CNAPE, was implemented. Senasag³ and CNAPE⁴ are the institutions linked to the production of organic products, under the required phytosanitary conditions in the country. Phytosanitary is related to the health of plants with respect to the requirements of international trade especially in agricultural crops. “The Phytosanitary Certificate, PPQ Form 577, is used to certify that the domestic plants or plant products have been inspected according to appropriate procedures, and they are considered to be free from quarantine

¹ Bolicert is the company in Bolivia that gives Certifications to producers.

² AOPEB is the acronym in spanish for the Association of Organizations of Ecological Producers of Bolivia

³ Senasag is the acronym in spanish for the National Service of Agricultural Health and Food Safety

⁴ CNAPE is the acronym in spanish for the National Council of Ecological Production.

pests, practically free from other injurious pests, and conform to the current phytosanitary regulations of the importing country.” (Animal and Plant Health Inspection Service, 2020) There are two types of markets that the product quinoa can be sold, the international market and the local market, the institutions and regulations for selling quinoa in the local market and for exportation to international markets will be described in the following lines. (Duran Olivares, 2019)

4.6.1 Regulations of quinoa for the international market

Quinoa is marketed worldwide as an organic product (when it has been produced in an ecological way). This variety has a phytosanitary certification granted by the competent authority of each country and which is based on the requirements demanded by each destination. In the Directorate of Plant Health dependent on Senasag⁵, officials carry out inspections to validate the circulation of quinoa in the international market. Senasag issues a phytosanitary certification in accordance with administrative resolution No. 163 dictated in 2005. The issuance of the phytosanitary certificate is based on the ISO16 standards of each country. Worldwide, each country has its own regulations for importing and exporting products. The regulations mention, for example, that pests do not have to be present in an organic product. (Duran Olivares, 2019)

For Senasag to issue a phytosanitary certificate of circulation, the marketer has to meet the following requirements:

- NIT (Tax Identification Number)
- License
- Sketch of the location of its warehouses
- Photocopy of the owner's or legal representative's card
- Payment of 400 bolivianos (57 \$us) for the registration valid for two years.
- Commercial export invoice
- Packing list
- Bank receipts for the service provided by Senasag
- Inspection letter issued by Senasag.

4.6.2 Regulations of quinoa for local market

The quinoa grain is traditionally consumed in the local market since decades ago but its consumption increased in the last years due to its nutritional value and benefits which gave

⁵ Senasag is the acronym in spanish for the National Service of Agricultural Health and Food Safety.

Bolivians the idea of adding this product not only in soups but as a substitute to rice and other forms such as processes products mixed with other cereals.

Although, the commercialization of quinoa in the national market is still limited by the small population that consumes organic products, this segment is growing with the tendency to consume natural and healthy products. According to Edgar Soliz, director of CIQ (International Quinoa Center) each person in the country consumes 1.4 kilograms of quinoa per year (in 2016), this number has increased to 2 kilograms in 2019 but is still low in comparison to 20 kilograms of rice and 25 kilograms of pasta per person per year. (Jacobsen, 2020)

Within the organic production and certification at the local market, the institution CNAPE grants the seal of ecological products for the local market with the aim to control the quality of products and promoting the consumption of ecological crops. This institution encourages producers towards organic cultivation in their communities which is regulated by Law No. 3525 by giving them workshops and trainings during the year in communities where crops are produced. The evaluation and qualification carried out for organic products is divided in three steps: transition 1, 2 and 3. In each of these steps, a control and guarantee for producers is carried out including the verification of the productive system in the growing area, field inspection, pest controls, how do they compost and what ecological practices they use.

4.7 Impacts of the production and export of quinoa in Bolivia

Bolivia is one of the poorest countries in the world, since 2004 it has successfully increased domestic exports and reduced poverty from 61% to 54% between the years 2000 and 2007. This success is attributed to several trade agreements the country signed with Chile, Mexico, Cuba and also its participation in organizations like World Trade Organization, Mercosur and the Andean Community which were mentioned before. According to the report written by Paula Capodistrias, the increase in exportation of quinoa in the country has contributed to this reduction of poverty mentioned, she states that “Even though minerals and hydrocarbons lead to current export market, since the 1990s there has been an increasing interest in the export of the traditional crop quinoa.” (Capodistrias, 2013)

Even though the efforts to promote quinoa in the country and the initiatives to increase exports as a poverty alleviation solution, there are some problems in the application of this approach which will be described below.

- **Decrease in local consumption**

Between 1995 and 2010, quinoa production and consumption patterns have suffered several changes. As it can be seen in the following chart, production of quinoa increased significantly but local consumption fell and export increased steadily.

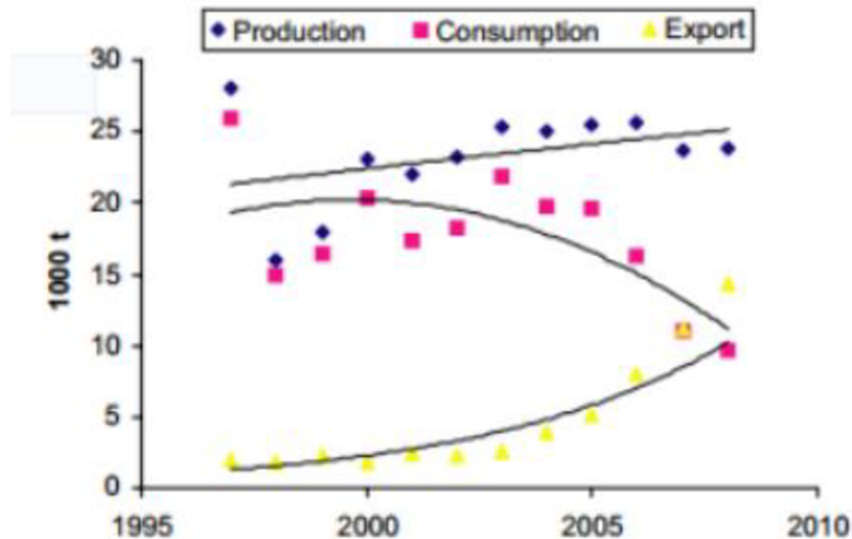


Figure 13 Production, consumption and export of quinoa - Source "ResearchGate, 2011"

This pattern can be explained by influence of market pressure on local prices because quinoa prices in the local market tripled from 1999 to 2008. Instead, foreign markets consume more every year and are willing to pay expensive price because the product is seen as sophisticated and nutritious.

- **Socioeconomic differentiation**

The intensification of quinoa production had negative impacts on the local socioeconomic context because before intensive production methods were used, anyone could appropriate land by clearing it by hand. After, tractors made it possible to clean land at higher speed facilitating the quick accumulation of land to those who owned the resources. "This initial distribution of land continues affecting the situation these days with a few land owners controlling most of the agricultural production of the country. The introduction of tractors continues on contributing to socioeconomic differentiation." (Capodistrias, 2013) another problem is that in Bolivia most of the quinoa produced is Fair Trade certified with the three main

supply chains for it being European and the main supplier represented by the local consumer's organization ANAPQUI which benefits more than smaller and poor farmers.

- **Environmental degradation**

The most important environmental problems related to quinoa production are the soil degradation from the increasing use of tractors and reduce animal manure being a drastic change in the production system. Natural vegetation which before served as livestock feed was replaced by the expansion of the agricultural frontier. “The increase in use of agricultural machinery also facilitates an adequate habitat for pests that leads to the increase use of agro chemicals which has a negative effect in the local biodiversity” (Capodistrias, 2013)

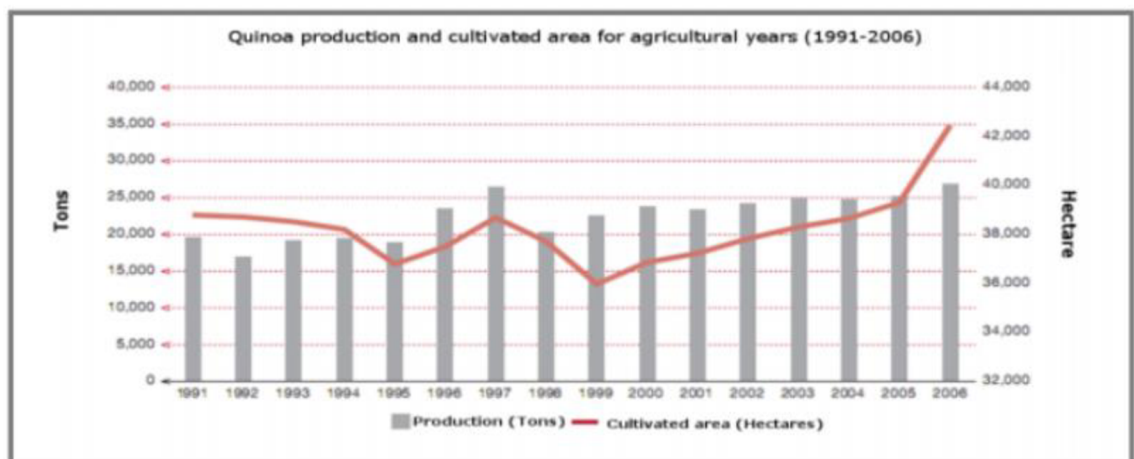


Figure 14 Quinoa production and cultivated area for agricultural years - Source "Research Gate, 2007"

4.8 Interviews

I interviewed two persons that exports quinoa from Bolivia, one exports to Spain and Germany since 2012 and the other one exports to the Germany. The objective of this interview is to obtain relevant and real information from people that work directly in the investigated field. In this way, the answers will provide a current, real vision of their experience regarding foreign trade in Bolivia.

In this part of the thesis I will mention the most relevant answers given by the two interviewees respecting their anonymity and only mentioning their names. The first person named Luis Fernando characterizes by being a male, 62 years old, born in La Paz actually

living in Santa Cruz since 2010, the other person named Javier is a male, 43-year-old who was born in Santa Cruz.

I considered very important to have a real opinion of people that works directly in the sector to know more about foreign trade in Bolivia, the importance of Foreign trade in the country, their experience about exporting quinoa from Bolivia and expectations for future years. Each person was interviewed individually. The first question asked is about themselves, where they are from and what they do for a living. The first interviewee answered that he is from the city La Paz, he moved to Santa Cruz in 2010 with his family searching for new business opportunities in the field of exporting chia. *“First, the idea was to cultivate and export chia, seeds that were in its boom at the moment when its health benefits became known. But things were complicated and other persons with more experience and capital were almost dominating the field so I was left with very little opportunities. In the searching for opportunities I started talking to a friend who told me why I don’t investigate to export or sell quinoa. At that moment I wasn’t convinced if quinoa was a good opportunity but it turned out that exports were increasing little by little and others that were already working with this crop told me to give it a try”* he said. The second interviewee tells that he was born and lives in Santa Cruz After, but travels several times in the year to La Paz because producers of quinoa are there in the cold weather. *I work exporting quinoa for almost 20 years now, I started helping my father in this business,* he explains. I asked about what they think about Foreign Trade, the first interviewee considers that *“Foreign trade is a very important tool for the growth and development in economy of almost all countries in the world. Modern lifestyle in the last years, globalization and now the rapid changes that the Covid-19 pandemic has brought allows people and countries to buy and sell abroad easily”*. The other person says that foreign trade is crucial for the economy of countries and a big opportunity for underdeveloped countries such as Bolivia because the country has resources that are bigger than the internal demand. I thought it was important to know the interviewees’ opinion about doing business in Bolivia to compare what reports and books establish with a real experience, one of them assures that *“Bolivia is a developing country with huge opportunities to grow due to abundant natural resources, working people and fast development in cities”*. The other person thinks that *“Bolivia has many resources and great potential to grow but governments laws and policies don’t contribute small producers to grow and export.*

Talking about the exportation of quinoa in Bolivia, Luis Fernando tells the following *“Quinoa is one of the products that grows in the coldest region of the country with unique characteristics that no other place in the world has referring to the Quinoa Real, the huge crops and high quality factors that differentiate from quinoa from Peru and Ecuador. This gives the country lots of opportunities to export the product to European countries principally because it is a region in the world that is increasing its consumption of organic and healthy foods like quinoa and now it the biggest importer of quinoa in the world”*, he says. Javier tells that *“Quinoa in Bolivia has excellent quality that qualifies for exportation to several countries and due to the perfect climate that the Andean area of the country has, crops grow easily so offer is greater than demand which is perfect for exportation. Of course in the last year other countries in Europe started to grow quinoa which affects us but we are willing to expand our exportation to compete in the international market”*. After asking Luis Fernando about his experience all these years about exporting to Spain and Germany, he explains that he started his company by buying high quality quinoa from local small producers and packaging it for local market with the objective of turning the product into new ways of consumption like cereal bars and milk. After two years in the market, an investor from Spain that already imports other products from Bolivia was interested in importing quinoa and it has been the best opportunity in my life he says. *“This investor helped adapting our product for export to international markets as well as investing capital to buy machinery and pay all the requirements to export. Some of the disadvantages of exporting is that procedures and paperwork take too much time and it seems that government policies want to make it difficult for local producers to export but it was possible after almost a year of patience and hard work”* he explains. When I asked Javier about his experience exporting to Germany, he explains that *“exporting to Germany has been challenging because of the requirements that they ask for in the product and also controls that importers do first to approve the product and then in every importation when products arrive. But, it was helpful because we are happy to know that our product has high quality and that it can also be distributed inside Bolivia and now we are prepared to export to other destinations”*.

I also asked both of the interviewees, how they see the future of exporting quinoa from the country? Luis Fernando says that he expects to grow his production and be able to sell to other countries in Europe such as France because he knows that it is one of the biggest consumers in the world and that organic products are becoming more popular as a healthy option to eat. To this answer I insisted to know if he will stay working with quinoa and if he

thinks to grow his company in future years to know if people like him will invest in the future and are willing to grow, the interviewee says *“Yes, I will continue working with quinoa because there are international destinations that are increasing their consumption of the product and I want to export to those destinations. Of course I know that I have to do it gradually introducing my products to each country after analyzing the demand and offer”*. Javier mentions that as he was saying, there is a great potential for quinoa in the future because people around the world is becoming aware of the nutritional benefits that the product has so there is a growing trend. European new producers may have benefits because they have facilities to export and commercialize their product but we need to compete with them in order not to lose customers.

In the interview I also asked the following: For the exportation of products and in this case quinoa, different requirements are needed including a phytosanitary certificate, NIT, certification, inspection letter by Senasag, payments and others, you have struggled gathering these requirements? because I read that they are considered as an obstacle in the process of exporting in the country. The interviewee Luis Fernando says *“Yes, all those requirements you mention are needed in order to sell quinoa, there are local requirements and requirements for international markets. They can be considered an obstacle because although we know that selling products and even more if somebody sells food, certain measures and controls must be taken by authorities, in Bolivia these take too much time to gather adding that public institutions were almost all the requirements need to be filed, are not organized, are informal, they lack procedures. First, when I started it took over a year to gather all the requirements, payments are sometimes more than what requirements show but after you have them all it is easier. We constantly have controls, inspections, need to actualize every year legal paperwork which takes times but you get used to it. Wanting to export to a new destination will be again paperwork and payments because each destination has different requirements but I hope we can do them ok”*. Javier tells that because their family business operates since many years ago, they already had all the paperwork when he started working but of course it took time to present all que requirements that in the last five years the government has asked. We understand that we need to fulfill requirements to sell and export but bureaucracy takes place in every procedure when we want to export a new product or destination. We have controls almost two times a year.

As last question I asked the quinoa exporters, what pros and cons they can mention from exporting quinoa from Bolivia. To this question, he answers: *“I can summary this answers saying that as advantages I would mention the creation of job opportunities, positive future*

trends of quinoa consumption in the world and as disadvantages the informality from public companies which gives certificates and licenses, long paperwork procedures, the lack of help from the country such as less requirements to obtain loans from banks being small and medium companies. Also I will consider a disadvantage if the actual government doesn't accomplish their aims of developing and implementing strategic business intelligence systems to promote the access to external markets and promote investment agreements and others to help foreign trade.” Javier tells that “the main advantages that I can mention are growing trends of quinoa consumption, soil and climate great conditions in Bolivia to grow quinoa and creation of job opportunities. The disadvantages are the lack of help from government and legal entities and bureaucracy in paperwork and procedures.

4.9 Output

Bureaucracy in paperwork and lack of support from the government are the main disadvantages of foreign trade in Bolivia mentioned by the two interviewees. The list of requirements mentioned in the point 4.6.1 in this thesis is confirmed to be real by the quinoa producers and although they understand that there are requirements and payments for all sectors and companies an important aspect is the informality in the public companies who deal with all the paperwork and the extended time it takes. This, if real should be solved by the actual government as one of the Functions and powers of the Vice Ministry of Exterior Commerce and Integration the “implementation of mechanisms that ensures transparency of public management in the negotiation, signing and implementation of economic, commercial and integration agreements”. (Ministerio de Relaciones Exteriores, 2016) Not forgetting that the Vice Ministry also mention as a goal to promote the commercial promotion of the Bolivian exportable offer and contribute to the facilitation of trade to turn the country into a logistics hub of foreign trade in the region.

5 Conclusion

The mutual exchange of services or goods between international regions and borders, known as Foreign Trade has increased over the years becoming a crucial activity for the economy in almost all countries. The need of certain goods and services that lack in some countries has led to the importation of products from other regions who export goods and services that have in excess or the availability to produce. This need has grown with time and taking into account globalization it has grown even more. Nowadays people and companies can sell and buy products from local or international markets from their computer at home or even their mobile phones, this has grown at a faster speed after the Covid-19 pandemic started in 2020 due to lockdowns and fear of going out.

Another trend that has also increased in the last years is the consumption of natural, organic and healthy products such as the quinoa grain. This crop that grows mostly in the regions of Bolivia, Peru and Ecuador, has various nutritional benefits and characteristics that turned it into a delicacy in homes and restaurants all over the world. This product was cultivated and consumed in some Latin American countries in soups or traditional foods but now quinoa is included in the everyday diet as an option like pasta or rice. There are even other new ways of consuming quinoa such as cereals, flour and others. The biggest importers of quinoa worldwide were United States and Europe but since last year (2020), Europe had the biggest percentage as quinoa importer. Countries like France, Germany, Netherlands and United Kingdom are increasing significantly their consumption of quinoa since 2015.

Bolivia, a landlocked country located in the center of South America, is one of the biggest producers of quinoa and the only in the world that produces “Quinoa Real”, a term used to describe high quality and big quinoa grains. In Bolivia, quinoa exports are growing in the last decades; in 2013 the highest figures ever recorded were reached. Although afterwards, exports of this product decreased due to the instability of the economy and social problems that affected GDP and the economy in general, it is expected that exports start to recover and increase year by year in the following years. Bolivia has many opportunities to develop more than ever the production and exportation of quinoa due to the growing tendencies of the consumption of the product and favorable climate and soil conditions that make certain regions in the country the best ones to produce quinoa. Also it can be considered as an opportunity that the actual Vice Ministry of Exterior Commerce and Integration mentions as part of their strategic objective to “strengthen integration processes, promoting national

interests, in search of better conditions in the social, commercial, economic and physical infrastructure fields for Bolivia through the negotiation and renegotiation of trade and investment agreements.” (Ministerio de Relaciones Exteriores, 2016)

6 References

- Angeli , V., Silva, P., Crispim Massuela, D., Waleed Khan, M., Hamar, A., Khajehei, F., . . . Platti, C. (2020, February 19). *US National Library of Medicine National Institutes of Health*. Retrieved December 12, 2021, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7074363/>
- Animal and Plant Health Inspection Service. (2020, June 2). *APHIS*. Retrieved November 2021, from https://www.aphis.usda.gov/aphis/ourfocus/planthealth/SA_Export/SA_Forms/CT_Export_certificates_forms
- Baier , S., & Standaert, S. (2020, March 31). *Oxford Research Encyclopedias - Economics and Finance*. Retrieved December 12, 2021, from <https://oxfordre.com/economics/view/10.1093/acrefore/9780190625979.001.0001/acrefore-9780190625979-e-327>
- Biz Latin Hub. (2019). *Biz Latin Hub*. Retrieved Septemebr 2021, from <https://www.bizlatinhub.com/category/bolivia/>
- Bondarenko, P. (2018, May 14). *Britannica*. Retrieved November 29, 2021, from <https://www.britannica.com/topic/absolute-advantage>
- Bourchtein, V. (2011). *The Principles of Economics Textbook:An Analysis of Its Past, Present & Future*. New York.
- Brander, J. A. (1995, February). *Strategic Trade Policy*. Cambridge: National Bureau of Economic Research. Retrieved December 12, 2021, from <https://www.nber.org/papers/w5020>
- Canavire, G., & Ehrlich, L. (2006). *Scielo Org*. Retrieved from http://www.scielo.org.bo/scielo.php?script=sci_arttext&pid=S2074-47062006000100005
- Capodistrias, P. (2013, May). *Research Gate*. Retrieved September 2021, from https://www.researchgate.net/publication/318112807_Impacts_of_the_production_and_export_of_Quinoa_in_Bolivia
- CBI. (2020, November). *CBI Ministry of Foreign Affairs*. Retrieved September 2021, from <https://www.cbi.eu/market-information/grains-pulses-oilseeds/quinoa-grains/market-potential>
- Coface Central Europe For Trade*. (2021). Retrieved from <https://www.cofacecentraleurope.com/Economic-analysis/Bolivia>
- Delso, D. (2021). *Nations Online Org*. Retrieved August 31, 2021, from [https://www.nationsonline.org/oneworld/bolivia.htm#:~:text=Bolivia%20occupies%20an%20area%20of,%2C8%20million%20people%20\(est.](https://www.nationsonline.org/oneworld/bolivia.htm#:~:text=Bolivia%20occupies%20an%20area%20of,%2C8%20million%20people%20(est.)

- Duggal, S. (n.d.). *Legal Service India* . Retrieved from <http://www.legalserviceindia.com/legal/article-2758-international-trade-law-theories.html>
- Duran Olivares, T. (2019, October 4). *Scielo Org*. Retrieved September 2021, from http://www.scielo.org.bo/scielo.php?pid=S0040-29152019000200002&script=sci_arttext
- E Finance management. (2018, October 30). *E Finance management*. Retrieved August 2021, from <https://efinancemanagement.com/international-financial-management/international-trade>
- EAE Business School. (2021, May 12). Retrieved August 26, 2021, from <https://retos-operaciones-logistica.eae.es/comercio-intraindustrial-de-la-teoria-a-la-eficiencia-productiva/#:~:text=El%20comercio%20intraindustrial%20se%20refiere,tipo%20de%20bienes%20o%20servicios>
- Encyclopaedia, T. E. (2018, October 12). *Britannica*. Retrieved December 11, 2021, from <https://www.britannica.com/topic/comparative-advantage>
- Factbook, T. W. (2020). *CIA - The World Factbook*. Retrieved September 2021, from <https://www.cia.gov/the-world-factbook/countries/bolivia/>
- Fernando, A. (2012). *El multilateralismo y su Caballo de Troya*. Camara de Eportadores de la Republica Argentina.
- Food and Agriculture Organization of the United Nations Regional Office for Latin America and the Caribbean. (2001). *La Quinoa: cultivo milenario para contribuir a la seguridad alimentaria mundial*. FAO Org. Retrieved December 12, 2021, from https://www.fao.org/quinoa-2013/what-is-quinoa/origin-and-history/en/?no_mobile=1
- Frachtbox team. (2020, September 1). *Frachbox*. Retrieved August 24, 2021, from <https://www.frachtbox.com/blog/what-is-foreign-trade>
- Framework, P. S. (2019). *Privacy Shield Framework*. Retrieved from <https://www.privacyshield.gov/article?id=Bolivia-Market-Overview>
- Fundacion Proinpa. (2014). Proinpa Org. *Revista de Agricultura Bolivia*, 5-7.
- Hanson, J. L. (1977). *A Handbook of Economics*. Trans-Atlantic Publications. Retrieved from <https://www.iedunote.com/foreign-trade>
- Hedrick-Wong, Y. (2018, October 18). *Forbes*. Retrieved August 2021, from <https://www.forbes.com/sites/yuwahedrickwong/2018/10/18/competition-in-international-trade-separating-fact-from-fiction/amp/>
- Helpman, E. (1999). The Structure of Foreign Trade. *The Journal of Economic Perspectives*, 121-144.
- Heritage Org*. (n.d.). Retrieved from 2021 Index of Economic Freedom: <https://www.heritage.org/index/country/bolivia>

- IBCE. (2010, June). *Instituto Boliviano de Comercio Exterior*. Retrieved September 2021, from <https://ibce.org.bo/images/publicaciones/comext183.pdf>
- IEDU Note. (2019). *IEDU Note*. Retrieved August 30, 2021, from <https://www.iedunote.com/foreign-trade>
- Index Mundi. (n.d.). *Index Mundi*. Retrieved September 2021, from https://www.indexmundi.com/bolivia/economy_overview.html
- INE. (2021). *INE - Instituto Nacional de Estadística*. Retrieved September 2021, from <https://www.ine.gob.bo/index.php/estadisticas-economicas/comercio-exterior/cuadros-estadisticos-exportaciones/>
- Instituto Boliviano de Comercio Exterior. (2021). *IBCE*. Retrieved from <https://ibce.org.bo/images/publicaciones/ce-280-cifras-del-comercio-exterior-de-Bolivia-2020.pdf>
- International Trade Experts. (2020, February 27). *Biz Latin Hub*. Retrieved September 2021, from <https://www.bizlatinhub.com/what-are-trade-agreements-bolivia/>
- Jacobsen, S. E. (2020). La producción de quinua en el sur de Bolivia. Del éxito económico al desastre ambiental. *LEISA Revista de Agroecología*. Retrieved from <https://www.leisa-al.org/web/index.php/volumen-28-numero-4/967-la-produccion-de-quinua-en-el-sur-de-bolivia-del-exito-economico-al-desastre-ambiental>
- Knight, P. (2020). *Environmental Conscience*. Retrieved December 12, 2021, from <https://environmental-conscience.com/international-trade-pros-cons/>
- LaHaye, L. (2008). *The Concise Encyclopedia of Economics*. Retrieved August 24, 2021, from <https://www.econlib.org/library/Enc1/Mercantilism.html>
- LaMarco, N. (2019, March 12). *Small Business Chron*. Retrieved December 12, 2021, from <https://smallbusiness.chron.com/maintain-strategy-decline-stage-26080.html>
- Lawrence, R., & Weinstein, D. (2017). *IDEAS*. (I. National Bureau of Economic Research, Editor) Retrieved September 2, 2021, from <https://ideas.repec.org/p/nbr/nberwo/7264.html>
- Legal Team Bolivia. (2020, February). *Biz Latin Hub*. Retrieved from <https://www.bizlatinhub.com/opportunities-doing-business-bolivia/>
- Lloyds Bank trade. (2020, September). *Lloyds Bank Trade*. Retrieved 2021, from <https://www.lloydsbanktrade.com/en/market-potential/bolivia/economy>
- Lopez Camacho, E. (n.d.). *Los Tiempos*. Retrieved from <https://www.lostiempos.com/actualidad/economia/20160803/decada-repunte-exportaciones-se-desploman>
- Lopez, R. (2020). *Captura Consulting*. Retrieved from <https://www.capturaconsulting.com/tendencias-del-consumidor-en-bolivia/>
- Management Study Guide*. (n.d.). Retrieved from <https://www.managementstudyguide.com/history-of-international-trade.htm>

- Marco Sanjuan, F. (2018, December 6). *Economipedia*. Retrieved September 1, 2021, from <https://economipedia.com/definiciones/condiciones-para-el-crecimiento-economico.html>
- Ministerio de Relaciones Exteriores. (2016). *Cancilleria Gobierno Bolivia*. Retrieved September 2021, from <https://www.cancilleria.gob.bo/webmre/node/2824>
- Observatory of Economic Complexity. (2021). *OECD*. Retrieved September 2021, from <https://oec.world/en/profile/country/bol>
- Paez, G. (2020). *Owlgen*. Retrieved September 1, 2021, from <https://www.owlgen.in/express-the-significance-of-foreign-trade/>
- Roldan, P. N. (2016, May 17). *Economipedia*. Retrieved August 25, 2021, from <https://economipedia.com/definiciones/competencia-imperfecta.html>
- Sherlock, J., & Reuvid, J. (2008). *The Handbook of International Trade*. London: GM Publishing Ltd.
- Smith, A. (2007). *An Inquiry into the Nature and Causes of the Wealth of Nations*. Amsterdam: Metalibri.
- Suranovic, S. (2010). *International trade theory and policy*. FlatWorld. Retrieved December 12, 2021, from https://saylordotorg.github.io/text_international-trade-theory-and-policy/s09-economies-of-scale-and-interna.html
- Tatum, M. (n.d.). *WiseGeek*. Retrieved November 19, 2021, from <https://www.wise-geek.com/what-are-the-differences-between-domestic-and-international-trade.htm>
- The Editors of Encyclopaedia. (2020, June 16). *Britannica*. Retrieved December 11, 2021, from <https://www.britannica.com/topic/Heckscher-Ohlin-theory>
- United Nations Conference on Trade and Development. (n.d.). *Key Statistics and Trends in International Trade 2020*.
- World Affairs - Why Foreign Trade is Important. (1934). *World Affairs*.
- World Trade Organization*. (1999). Retrieved from https://www.wto.org/english/tratop_e/tpr_e/tp109_e.htm

7 Appendices

Functions and powers of the Vice Ministry of Exterior Commerce and Integration:

- Incorporate in the design and practice of international economic and commercial relations the principles of the Political Constitution of the State.
- Formulate and execute policies and strategies for bilateral, regional and multilateral international economic relations in accordance with the constitutional principles of the Plurinational State.
- Negotiating economic, commercial, investment, integration treaties, agreements and Trade Agreements of the Peoples for solidarity relations, fair trade, complementary and cooperation with other States.
- Participate in international economic and commercial institutions and - organizations in coordination with the pertinent instances.
- Promote the strengthening and consolidation of economic cooperation and international trade relations.
- Preside over the Bolivian delegations related to economic and commercial matters and integration.
- Design, negotiate and promote investment agreements.
- Consolidate, promote and negotiate economic and technical cooperation agreements with other states, international organizations and cooperation agencies, in coordination with the corresponding national entities.
- Propose and implement integration policies and physical infrastructure, promoting Latin American integration in particular.
- Promote, negotiate and manage facilities, areas, warehouses and free zones, granted to Bolivia abroad.
- Supervise compliance with the agreements signed and the decisions taken in the economic and international trade and integration fields.
- Coordinate economic, commercial and integration negotiations with social organizations, nations and rural native indigenous peoples and institutions of civil society, and implement mechanisms of social control and participation.
- Implement mechanisms that ensure the transparency of public management in the negotiation, signing and implementation of economic, commercial and integration agreements.
- Direct and supervise the performance of Foreign Service officials in the economic and commercial area.
- Propose and promote policies for the development of exports of value-added goods and services.
- Develop and implement strategic business intelligence systems to promote articulation and access to external markets.
- Execute logistics development policies for foreign trade in coordination with the competent entities. (Ministerio de Relaciones Exteriores, 2016)

Nutritional value of quinoa seeds cultivated in different regions

Table 1

Proximate composition of quinoa seeds cultivated in different regions.

Growing Year	Country	Location	Cultivar	Observation	Carbohydrate	Protein	Fat	Fiber	Ash	Reference
(values in % or g 100 g ⁻¹ Seeds DM)										
1998	Bolivia		Real		63.7	12.9	6.5	13.9*	3.0	[12]
2006–07	Italy	Vitulazio	KVLQ520Y	early sow	55.6	16.2	7.8	16.1*	4.3	[13]
				late sow	54.8	16.2	7.7	16.9*	4.1	
			Regalona Baer	52.8	16.8	7.9	18.6*	4.0		
2006–09	Argentina	Salta and Jujuy	mean value of 21 data entries		51.4	16.8	5.9	12.1*	4.7	[9]
2010	Chile	North	Ancovinto		68.1	13.0	6.2	1.5	3.4	[14]
			Cancosa		65.8	13.6	6.0	1.8	3.5	
		Center	Cáhuil		64.2	11.1	7.1	1.2	3.2	
			Faro		63.8	11.4	6.7	1.6	3.5	
		South	Regalona		59.4	14.4	6.4	1.8	3.7	
			Villarrica		56.5	16.2	5.6	2.9	3.7	
2010	Peru	Cusco	ND			13.2	6.5	4.2	2.3	[15]
			ND			13.5	6.3	7.0	2.3	
		Puno	03-21-0093		11.8	-	-	2.8		
			03-21-1181		13.5	4.0	2.9	3.1		
			Coito		14.7	5.3	1.8	2.8		
			Huaripongo		13.2	6.1	2.5	2.9		
			INIA-415		12.7	6.9	2.2	2.5		
			Pasankalla							
			Roja de Coporaque		11.5	5.2	2.3	2.9		
			Salcedo		13.2	5.3	1.8	2.4		
			Witulla		12.3	5.3	2.6	2.6		
		2011	Puno	La Molina 89		13.6	6.0	3.0	4.8	
				Blanca de Juli		12.4	4.9	1.8	3.0	
Kcancolla				13.5	5.1	2.7	3.1			
		Sajama		12.7	4.1	1.7	2.7			
2010	Italy	Vitulazio	Titicaca, Q100	100% irrigation	49.0	14.6	5.1	17.6*	3.4	
			Titicaca, Q25	25% irrigation	49.9	14.4	5.2	14.6*	3.3	

2013	Peru	Mantavaro valley	Ayni		14.8	4.7			[16]
2015	USA			USDA database	57.2	14.1	6.1	2.4	[17]
				Various primary sources †	59.9	13.1	5.7	3.3	3.3
2015	Germany	Stuttgart	Zeno		12.0	5.5	‡		[18]
			Jessie		16.1	7.3	‡		
			Puno		13.0	6.5	‡		
			Titicaca		13.4	7.5	‡		
2016	Germany	Stuttgart	Zeno		12.0	5.5	‡		
			Jessie		13.1	7.3	‡		
			Puno		13.0	6.5	‡		
			Titicaca		12.3	7.5	‡		
2016	Chile	Río Hurtado	Regalona		15.2		3.1	[11]	
			Salcedo		18.1		3.3		
			Titicaca		16.4		3.6		
2016	Spain	El Pobo	Regalona		17.8		3.0		
			Salcedo		15.7		3.2		
			Titicaca		15.3		3.5		
2016	Peru	Arequipa	Salcedo		14.6		3.3		

* values for fiber are reported as total dietary fiber. † n= 34 for carbohydrate, 37 for protein, 37 for fat, 23 for fiber, and 37 for ash. ‡ mean values for two growing years.

Table 1 Nutritional value of quinoa seeds in different regions - Source "US National Library of Medicine National Institutes of Health"