The Agro Exports of Organic Native Products and Environmental Security in Peru

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Abstract

The study objective is to analyze agro-exports of organic products and environmental security (certification) in Peru. Agro-exports are the second generator of foreign currency for Peru. The descriptive, comparative-graphical method and the polynomial curve are used. In 2019 traditional agro-exports and non-traditional agro-exports contributed 11% and 89% of total agro-exports respectively, the main markets were the United States (35%) and the Netherlands (15%). Peru is the world's leading exporter of native functional products (called superfoods) quinoa and maca. Quinoa is the most demanded native agro-export product internationally. It was found that during the period 2000-2019 the main Peruvian agro-exports of non-traditional products with a vertiginous growth are fruits and vegetables. For the year 2019, fruit agro-exports in terms of FOB value in millions of US $ contribute 56% to the total of non-traditional agro-exports. The increase in fresh grapes, fresh blueberries and fresh avocados is remarkable. Environmental security in terms of the area for organic production affects 51% of agro-exports. Peru promotes organic production from the producer to the final consumer and the certification of organic products in the production, transformation and marketing processes.

Keywords: Agro exports, organic products, certification, environmental security

Introduction

In recent decades, the Peruvian agro-export sector is the second economic activity with the highest profitability after mining, with earnings from non-traditional exports multiplying almost eight times (Larrea, *et al.* 2018).

The first efforts to diversify exports of traditional products such as coffee, cacao, sugar and cotton began in the mid-1980s with the successful promotion of asparagus exports, in the 1990s it was accompanied by diversification across a wide range of other high-value products for export (World Bank Group, 2017).

Agro-exports are the second generator of foreign currency for Peru. Since the year 2000, its export figures have experienced an exponential increase of US$ 700 million to US$ 7 billion (trillion). Peru is known worldwide for its biodiversity, climatic zones allows in produce variety of high quality products, increasingly recognized by international markets, Europe is the second destination market for exports of fruit and vegetables, accounting for 37% of the total exported in 2019 (Blueberries Magazine, 2020).

The producers of quinoa the Puno region use local inputs and have limited access to providers of financial and technical assistance, in the region of Junin farmers enjoy greater access to these providers and answers more quickly to market changes / price (Mercado and Ubillus, 2017).

About 65% of national agriculture depends on native genetic resources, such as potatoes, corn, sweet potatoes, Andean grains (quinoa, kiwicha and kañiwa, tarwi or lupine), fruits (avocado, papaya, prickly pear, camu-camu, custard apple, custard, cocoon, cherry, sweet cucumber, etc.), roots (arracacha, yacón, maca), Andean tubers (oca, mashua, olluco), cacao, legumes (pallar, beans, pashullo) and various other crops (Lakkala *et al*., 2019).

Peru is ready to implement plans to promote its range of superfoods with plans to increase exports of its ethnic and other agricultural products to the Middle East region in line with growing demand.
Peru has unique products in the world, from agricultural and artisan products to its gastronomy.
The range of Peruvian superfoods is classified into fruits and vegetables (aguaymanto, blueberries, artichokes, camu camu, custard apple, asparagus, pomegranate, passion fruit, guanabana, lúcuma, mandarin, avocado and grapes), grains (cacao, chestnut, sweet potato), cañihua , chia, amaranth, maca, purple corn, quinoa, sacha inchi, yacón and yuca), and seafood (anchovy, eel, tuna, bonito, mackerel, squid, scallops, horse mackerel, shrimp, mahi-mahi, hake, paiche, cuttlefish and trout). At the Asia Fruit Logistics 2020 Fair to be held from September 16 to 18 in Singapore, through PROMPERÚ, various Peruvian companies negotiate organic products. In Biofach 2020, the main fair of organic products in the world, aguaymanto, cacao, coffee, camu camu, chestnut, ginger, kiwicha, quinoa, lúcuma, maca and sacha

inchi were exhibited, promoted under the Super Foods Peru brand, highlighting the nutritional properties that benefit its consumers.

Literature review

Peru's rich biodiversity distinguishes it as a provider of superfoods, such as cacao and chia seeds, but also lesser-known native crops such as lucuma, a tropical fruit known as the "gold of the Incas", sacha inchi, also known as the "Inca peanuts", camu camu, a powerful source of vitamin C, and other Andean grains such as kiwicha and cañihua o kañiwa. Peru launched the Superfoods brand at the Fruit Logistica trade fair in Germany in February 2017 aimed at highlighting quality, variety and its benefits for consumers (Oxford Businnes Group, 2018).

According to Legal Team Peru (2019), Peru and Bolivia export quinoa, the health benefits of the superfood include high levels of protein and it contains all the essential amino acids.

The aguaymanto or Physalis peruviana (golden berries or Inca berries), are another superfood from Peru, the fruit is receiving worldwide attention for its high levels of antioxidants. In Peru, aguaymanto is produced in the Ancash, La Libertad, Cajamarca, Lambayeque, Ayacucho, Lima, Junín, Huánuco and Cusco regions and is exported to the European market and the United States, where demand is growing. Camu Camu or Myrciaria dubia, a fruit native to the Amazon rainforest located in Peru, is a promising super food in world markets, Peru is the largest exporter of camu camu, common export destinations include Japan, USA. USA, Italy and other European countries (Legal team Peru, 2019).

Higuchi and Dávalos (2016) identified two segments of consumers of organic products in Lima Metropolitana, central –level and midlevel who buy organic food because they are healthiers, for best flavor or cooler than the product standard is and the environmental safeguards, additionally the central level segment exhibits greater preferences for sensory, quality and learning of organic attributes; also evidence rum that educational attainment increases the probability of being an organic consumer midlevel .

In Peru, the boom in agricultural exports has changed from traditional crops (coffee and cotton) to agribusinesses non - traditional and has left room for small farmers to enter the sector traditional agro-industrial like the *Gossypium Barbadense* native cotton on the north coast of Peru, part of the pre-Inca Moche indigenous culture supported by Law No. 29224 of 2008, affirming native cotton as the country's genetic, ethnic and cultural heritage. Pisani *et al*., (2015) argue that the revival of the Peruvian native cotton is an opportunity to generate income for the small farmers.

Today, Peru has a high biodiversity, to develop various crops native of interest in the international market (Correa *et al.*, 2017).

Compared to international competitors Peru has had the fastest evolution in agro-exports of fruit and vegetables from 2004 to 2016, surpassing China and India and in the region to Mexico and Chile have grown much less (Zegarra, 2019), also found that a higher educational level of farmers in agro-export zones increases export survival capacity, that greater access to credit has a negative (unexpected) effect in increasing the risk of stopping exporting , in addition, agro- exports of the coast they have greater survival capacity (climatic advantages, agriculture under irrigation, transportation) than the mountains and jungle.

The native species of bio-commerce are being valued with innovative techniques that will improve their production and are friendly to the environment, in itself, has fostered good agricultural practices and the conservation of species and ecosystems (De la Cruz, 2015).

In recent years, organic products, many of them called superfoods, have become very important in the global consumer's diet.

Before exporting to Portugal, it must be ensured that organic certification is harmonized with EU legislation, otherwise the product will not be recognized as organic in Europe (MINCETUR, 2013).

According to the International Trade Center (ITC, 2015), Peru has managed to become the world's leading provider of asparagus and quinoa, and the world's third largest provider of fresh cranberries and avocado.

Asmat-Campos et al. (2019) propose to increase the agro export of dehydrated lucuma that would be processed using an innovative technique (equipment) of solar dehydration that preserves the organoleptic properties of the fruit, while reducing production costs and additionally reducing CO2 emissions.

From a human or national security perspective, environmental security is a concept intended to give greater importance to environmental change issues that already apparent in the politicization of nature inherent in the emergence of political ecology from the 1990s (Hough, 2019).

The desire to increase productivity and yields of agriculture has led historically to environmental degradation, reduced biodiversity and limitations to ecosystem services, with the greatest impacts on the poor. Food security must be increased in a sustainable way and resilient to climate change, while also reducing greenhouse gas emissions, alleviating poverty and conserving biodiversity (Poppy *et al*., 2014).

Environmental security reflects the ability of a nation or a society to resist scarcity of environmental assets, environmental risks, or adverse changes related to the environment (Belluck *et al*., 2006).

According to Miner (2019) it is possible to preserve forests through trees reforestation, minimizing the consumption of meat and palm oil, choosing sustainable coffee and cacao cultivation. Mountain ecosystems may be strengthened by replanting

native grass and trees. The negative impacts of climate change in South America can be prevented by increasing the sustainability of human land use practices.

Sustainable coffee certification has been a hallmark of Peruvian coffee production, including certified organic coffee since 1989 with OCIA and since 1994 with Fair Trade. A significant proportion of Peruvian cocoa is also certified for export. A 2013 Rainforest Alliance survey found that certified farmers reported better management and organization, increased access to education and training, and improvements in soil and biodiversity (International Trade Center, 2015).

Justification and importance:

The topic is justified because since 10,000 years ago the ancient Peruvians accumulated important knowledge about the uses and properties of native species, and today, the world market demands healthy and nutritious food.

It is important to generate more currency pair to Peru exporting native organic products in green markets that contribute to the welfare of consumers in the world and also promote sustainable use of the resources native Peruvians and the (security) environmental sustainability.

General objective

Analyze the relationship between agro-exports of native organic products and environmental security in Peru

Specific objectives

Find out which native products have the highest international demand

Determine the status of the agricultural exports of the super - food and environmental safety (certification)

Methodology

Non-experimental, descriptive and explanatory research.

Temporal and spatial scope:

The study includes the agro-export of organic Peruvian native products and security environment in Peru (2000-2019)

Universe: agro-exports of organic products, unit of analysis: native product

Materials:

Information sources: Specialized magazines and journals on agro-exports and environmental impact.

Statistics of the Ministry of Foreign Trade and Tourism -MINCETUR, PROMPERÚ, INEI.

Software: Excel

Data collection techniques: Secondary information, PROMPERÚ, BCRP, PRODUCE

Process:

First, the characteristics of the agro-exportations of native Peruvian products and environmental security have been reviewed.

Second, the relationship between agro-exports of native organic products and environmental security in Peru is studied.

Third, the contribution of organic products to non-traditional agro-exports is analyzed. The certification of organic products, environmental security and Peruvian economic development are also addressed.

The polynomial curve and agro-export approaches are used.

Results

In this section, the main products of Peruvian agro-exports are comparatively analyzed and then we review the progress in the certification of organic products as an environmental safety factor.

Comparative analysis of Peruvian agro-exports

In 2017, 94% of traditional Peruvian agro-exports were Coffee (86%) and Sugar (8%), and more than 50% of Non-Traditional agro-exports were mainly Grape (13%), Avocado (12%), Asparagus (11%), Blueberry (7%), Mango (5%) and Cacao (5%) (PromPerú, 2017).

The exports of functional products and of the biocommerce in the year 2017 represented the 5% of the participation of the whole of the agricultural exports non-traditional with growth of 16%, compared to the 2016 by increasing the exports of quinoa grain, sauces quinoa, maca powder, giant corn snacks, and roasted sacha inchi to the United States and South Korea.

Peru has been positioned in the exports of quinoa and maca (1st place at level worldwide) and nuts from Brazil without shell (2nd place at level worldwide). The main destinations of the products functional and of the biocommerce during the 2017 were the United States (33%), Korea of the South (14%), Spain (7%), Netherlands (5%) and Canada (5%); the which had one variation of -2%, + 1208%, + 18%, -16% and + 11%, respectively. At the highest increase in exports to South Korea stand out the nut of Brazil and the sacha inchi toasted (PromPeru, 2017).

For 2019 traditional agro-exports contributed 11% and non-traditional agro-exports 89% of total agro-exports (table 1), the main markets were the United States (35%), the Netherlands (15%), Spain (6%) and the United Kingdom (5%). They highlighted the increase in fresh blueberries, fresh grapes and fresh avocados. Of the functional products, quinoa in grains stands out (PromPerú, 2019).

Table 1. Agro-exports contribution of traditional and non-traditional products, Peru 2000-2019

Año	% traditional products agro-exports/Total Agro-exports	% non-traditional products agro-exports/Total Agro-exports
2000	38.7	61.3
2001	32.2	67.8
2002	28.2	71.8
2003	26.4	73.6
2004	28.9	71.1
2005	24.7	75.3
2006	32.0	68.0
2007	23.3	76.7
2008	26.4	73.6
2009	25.8	74.2
2010	30.7	69.3
2011	37.3	62.7
2012	26.2	73.8
2013	18.6	81.4
2014	16.7	83.3
2015	14.1	85.9
2016	15.7	84.3
2017	13.8	86.2
2018	11.4	88.6
2019	10.9	89.1

Source: BCRP, Prepared by the authors

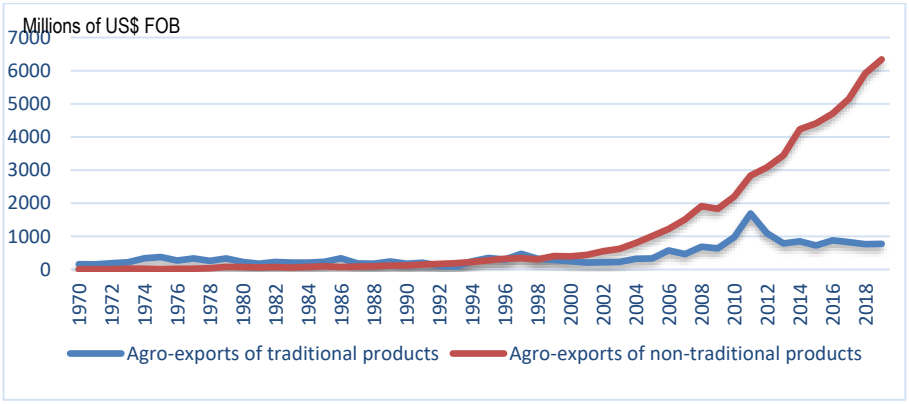
According to International Monetary Fund (2020: 38) in the last two decades, Peru has experienced an agro-export boom, while the exports of mining, oil and gas still accounts for about 2/3 of total exports and 22 percent of GDP, the agricultural exports have expanded dramatically, reaching US $ 6 billion or 2.7 percent of GDP in 2019 from 0.4 percent in 2001.

Seasonal exports to the northern hemisphere of high-value fresh fruits and vegetables (mainly grapes, avocados, blueberries and asparagus) total $ 2.5 billion or 1.2 percent of GDP. Exports of other products (including citrus, bananas, cacao and pomegranates) are also increasing rapidly.

Traditional agriculture is labor-intensive characterized by low productivity, employing 4.5 million workers (25 percent of the workforce) mainly in non-salaried or informal jobs; whereas the agricultural sector agro-export provides 0.8 million formal agricultural employment, over 0.46 million in 2004, and indirectly supports 0.7 million in jobs, productivity and high incomes, while, poverty has fallen dramatically in rural areas (from 80 percent in 2004 to 36 percent in 2018), coastal

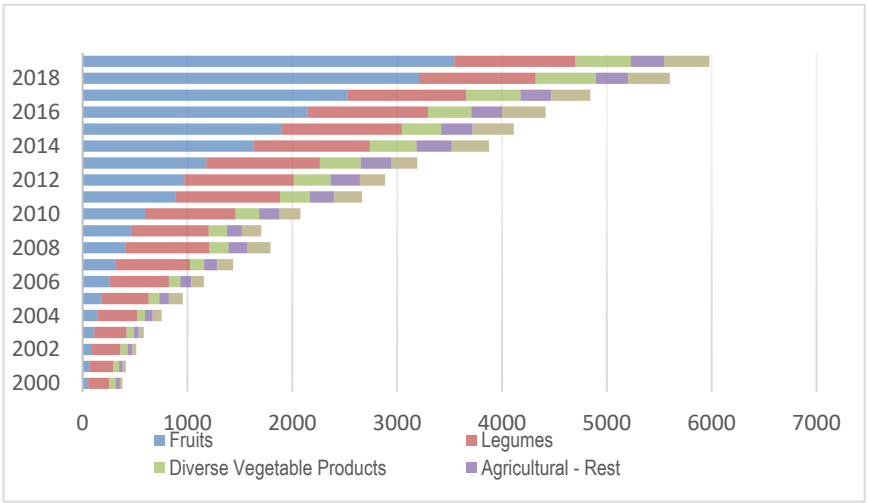
poverty has fallen further (from 67 percent in 2004 to 19 percent in 2018) (International Monetary Fund 2020: 38).

Figure 1. Peruvian agro-exports of traditional and non-traditional products - FOB values (US$ million), 1970-2019



Source: BCRP. Prepared by the authors

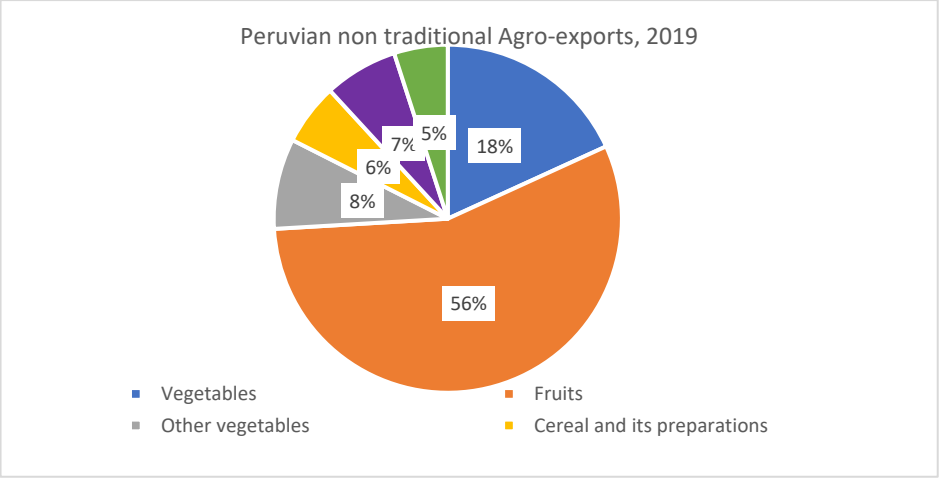
Figure 2. Agro exports of non-traditional products - FOB values (US $ million), Peru, 2000-2019



Source: BCRP. Prepared by the authors

In the study period 2000-2019, there was a boom in non-traditional agro-exports led by fruits and vegetables with 56% and 18% respectively (figures 1 -3).

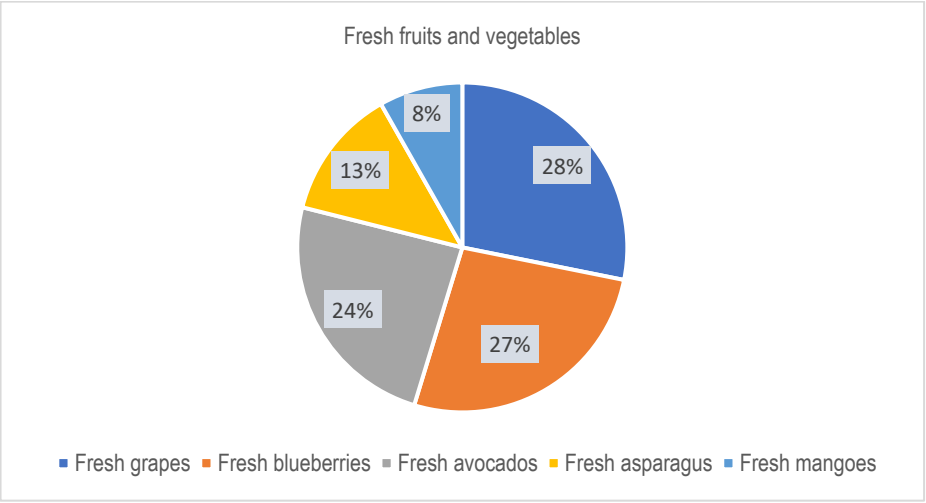
Figure 3. Non-traditional agro exports (FOB values in millions of US$), Peru, 2019



Source: BCRP, SUNAT.

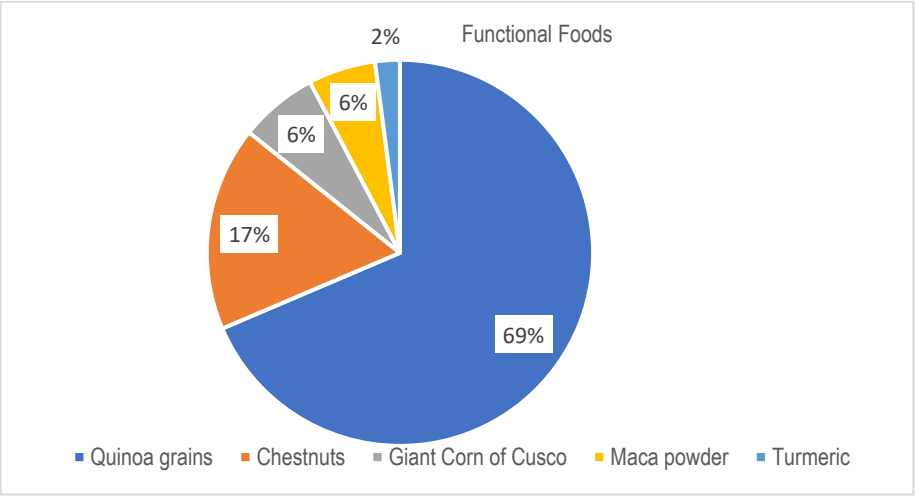
The main fresh fruits and vegetables exported in 2019 were found to be grapes and blueberries (figure 4). Likewise, the main native functional product exported is quinoa (figure 5).

Figure 4. Non-traditional Agro exports: Main fresh fruits and vegetables - FOB value US$ million, Peru 2019



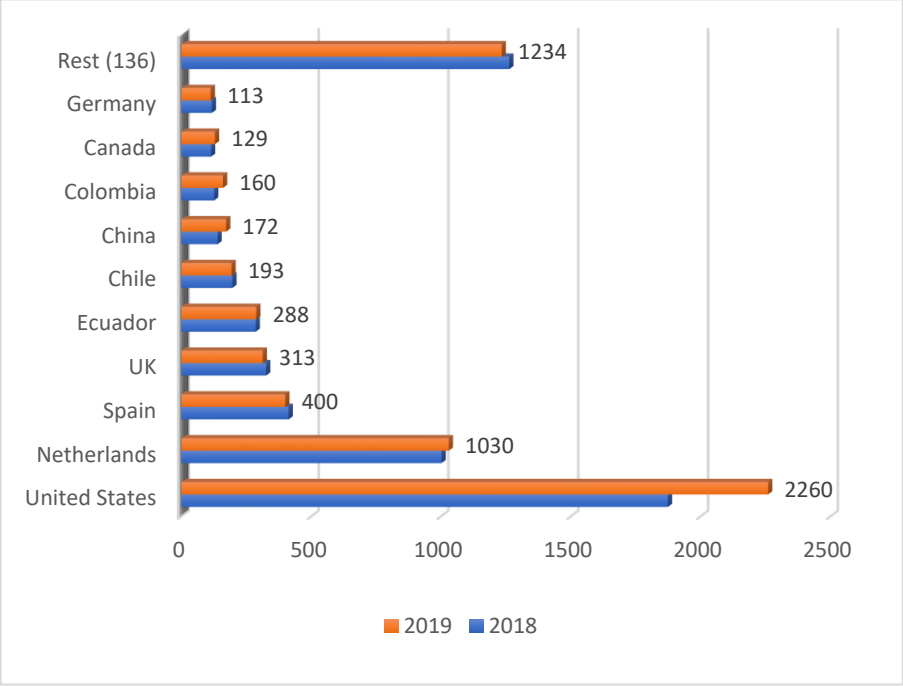
Source: PROMPERU

Figure 5. Non-traditional Agro exports: Main functional foods- FOB value US$ million, Peru 2019



Source: PROMPERU

Figure 6. Main markets for non-traditional agro-exports - FOB US $, Peru 2018- 2019



Source: PROMPERU

The main international buyers of Peruvian agro-exports are the United States and the Netherlands (figure 6).

In Peru, the area destined for organic production (INEI, 2019) is less than 2% of the total agricultural hectares (ha).

Table 2. National organic production statistics 2018

Region	Number of Operators (ha)	Number of Producers (2)	Area (ha) Transition	Organic Area	Total
Amazonas	28	7,337	4,784.23	12,626.96	17,411.19
Ancash	16	9	1.5	773.36	774.86
Apurímac	6	1,120	475.31	2,881.33	3,356.64
Arequipa	15	611	49.82	11,713.95	11,763.77
Ayacucho	28	3,910	6,221.44	9827.77	16,049.21
Cajamarca	89	20,013	14,252.27	35,294.65	49,546.92
Cusco	32	5,555	4,991.27	14,768.15	19,759.42
Huancavelica	2	3	0	0.76	0.76
Huánuco	13	2,553	2,195.31	6,413.12	8,608.43
Ica	21	118	225.86	928.57	1,154.43
Junín	144	15,246	23,019.87	43,625.70	66,645.57
La Libertad	27	2,801	1,352.26	1,750.62	3,102.88
Lambayeque	36	1,202	338.63	1,805.60	2,144.23
Lima	306	4,563	6,843.08	12,441.42	19,284.50
Loreto	1	22	30.5	46.54	77.04
Madre de Dios (3)	5	402	278.96	213,114.48	213,393.44
Moquegua (4)	0	0	0	0	0
Pasco	13	817	1,168.39	1,853.53	3,021.92
Piura	146	14,687	4,557.42	19,623.59	24,181.01
Puno	12	4,530	1,699.13	3,994.94	5,694.07
San Martin	68	16,187	17,399.73	30,379.05	47,778.78
Tacna	1	13	1.21	9.12	10.33
Tumbes	4	120	145.35	158.5	303.85
Ucayali	9	1,735	5,195.15	5,596.03	10,791.18
TOTAL	892 (1)	103,554	95,226.69	429,627.74	524,854.43

(1) The number of operators is accounted for ignoring the operators that operate in 2 or more departments.

(2) The data corresponds to the number of organic and transition producers.

(3) Wild collection areas

(4) In 2018, no information on organic production was recorded.

Source: SENASA

In Peru 2018, The Cajamarca region concentrates the largest number of organic producers with 20,013 ha. The regions of Madre de Dios, Junín and Cajamarca represent the largest certified organic areas with 213,114 ha, 43,626 ha and 35,295 ha respectively (table 2).

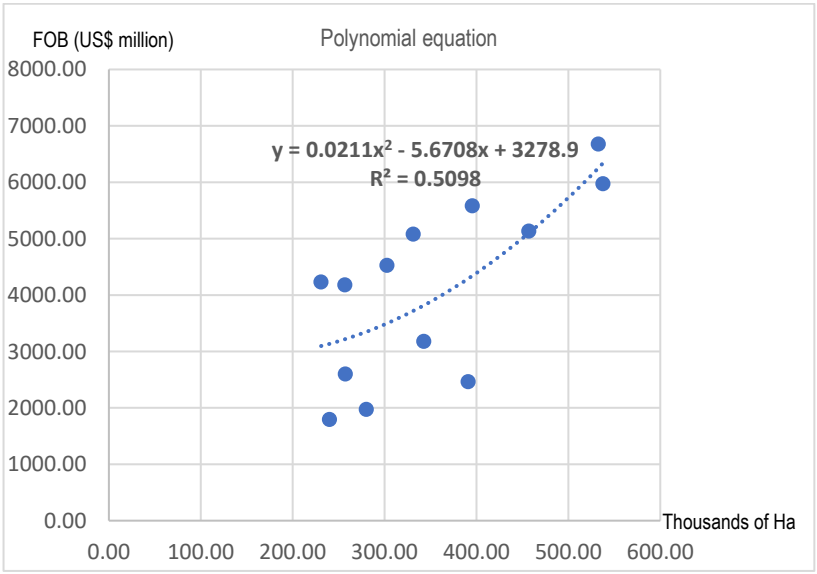
Table 3. Agro-exports and area for organic production, Peru 2006-2018

Año	Total Agro-exports FOB (US$ million)	Area destined for organic production (Thousands of Ha)
2006	1793.79	240.17
2007	1972.58	280.24
2008	2598.58	257.44
2009	2461.97	390.95
2010	3177.65	342.70
2011	4524.88	302.60
2012	4177.51	256.84
2013	4230.25	230.94
2014	5078.74	331.29
2015	5131.39	457.04
2016	5580.27	395.56
2017	5972.61	537.75
2018	6675.75	532.66

Source: BCRP; INEI. Perú: Anuario de estadísticas Ambientales 2019

Table 3 shows the accelerated increase in Peruvian agro-exports, we assume the area for organic production as an indicator of environmental security.

Figure 7. Relationship between Agro-exports and area for organic production, Peru 2006-2018



Source: The authors

The X axis measures the area destined for organic production in thousands of hectares, the Y axis (dependent variable) measures total Peruvian agro-exports (millions of US$). The polynomial curve fits the data better than a linear equation and Figure 7 shows that the area destined for organic production (indicator of environmental security) has an impact of 51% on Peruvian agro-exports.

Advancement of quality certifications of Peruvian agro-exports of native organic products and environmental Security

According to Supreme Decree No. 002-2020-MINAGRI, the National Agrarian Health Service - SENASA is the competent national authority to authorize and supervise the certification entities, which operate in Peru; and promotes and supports the certification of organic products directly to producers in order to guarantee the organic condition of products called organic, biological or ecological in the internal and external market, helping to promote the sustainable and competitive development of organic production in Peru, from the producer to the final consumer. SENASA also authorizes and controls the use of the National Seal of organic products, in the production, transformation and marketing processes according to the national organic production standards.

In Peru, advances in quality certifications guarantee the quality of agricultural production, the export process, and environmental safety. SENASA registers organic production certifiers such as Bio Latina Perú, BCS Peru, Control Unión, IMO Control Latinoamérica Peru, OCIA international PERU, CERES PERU among other. Organic certification helps to differentiate the product, to have visibility in national and international markets, to have environmental benefits: healthy natural resources, soil conservation and species biodiversity.

Conclusions

In the period 2000-2019, the main Peruvian non-traditional agro-export products are fruits and vegetables, which increased from 53 and 192 million FOB dollars in 2000 to 3,544 and 1,153 million FOB dollars in 2019, respectively.

For the year 2019, fruit agro-exports in terms of FOB value in millions of US$ contribute 56% of total non-traditional agro-exports.

Quinoa known as functional food is the most demanded native agro-export product internationally.

Environmental security via the area destined for organic production has a 51% impact on total agro-exports.

Peru promotes organic production from the producer to the final consumer through SENASA, who authorizes and controls organic product certifiers and controls the use of the National Seal of organic products in production, transformation and marketing processes.

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