Netherlands Enterprise Agency

Fact-finding Agro-Food Bolivia

With a special focus on the Santa Cruz region

Commissioned by the ministry of Foreign Affairs

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Kingdom of the Netherlands

Fact-finding

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With a special focus on Santa Cruz region

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Netherlands Enterprise Agency

Kingdom of the Netherlands

Fact-finding Bolivia 2016-2017

Commissioned by the Royal Dutch embassy in Lima

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Executive summary

A quick overview in English, Spanish and Dutch

In the last decade Bolivia showed a significant development in the agricultural production and agro-food industry. A positive contributing factor was the strong GDP growth from 2006 until 2015, supported by the high prices for gas and minerals. While mining and gas revenues decreased in recent years, the agricultural sector remains a very valuable economic driver for Bolivia. It is a sector in which opportunities are endless, but with deviant local circumstances and the typical challenges of a country in development.

Fact-finding

This fact-finding report, commissioned by the Dutch embassy in Lima, has the objective to pinpoint some of the challenges in Bolivian agribusiness as well as to identify potential opportunities for bilateral cooperation on different levels of the private, non-profit and public sector. Certain findings may be a motive for further investigation.

The principle focus of this report will be on the agricultural commodities and livestock (cattle and poultry) and some of their related businesses such as feed, dairy and meat. However, potential opportunities in preserving fruit, high value crops and food processing are also briefly reviewed.

Department of Santa Cruz

Santa Cruz is the centre of agricultural development, especially in commodity crops as well as commercial livestock. The different agro industries in this region are well established in branch and producers organisations that execute projects and work closely together with their members. The open business mentality and entrepreneurial motivation are positive characteristics for the promotion of potential cooperation with Dutch counterparts.

Crops

Soybean is the leading commercial crop, dominating the agro production as well as the export (mostly soybean oil and oil cake). Other relevant crops include sugar cane, maize, wheat, sorghum and sunflower, each playing a significant role in different agro-food or feed value chains in Bolivia.

Bolivia's potential is large thanks to the abundance of fertile lands and different climate zones. Nevertheless, Bolivia still lacks competitiveness due to low yields. On one hand, transgenic crops and quality seed have not been adopted as much as in neighbouring countries. On the other hand, poor agricultural practices, monocrops and excessive usage of agrochemicals result in soil erosion. In the meantime, the need for proper water management and irrigation has become a national priority, especially after the drought in 2016.

Poultry, livestock and dairy

Crops such as maize and soybean are important feed ingredients for Bolivia's livestock, and indirectly for meat and dairy products. Larger companies try to maintain grip on the inputs by having their own storage and feed production. However, further down the chain they are still subject to an underdeveloped infrastructure and cold chain.

The poultry industry has experienced the strongest growth and reached a mature level in production and applied technologies. It offers room for further increasing efficiency through integration and scaling. In contrary to the poultry sector, cattle farms are much more extensive and less technological, but with a future perspective to increase beef export. Animal health and sanitary control are key. The dairy industry is under heavy pressure because of current low international milk prices. Quality is another major subject in the industry, in which the production process is generally low tech and consists of dairy farmers of all kinds of sizes. Growth potential also exists in the pig industry, for the consumption rate is currently low and is expected to increase.

Government

The government withholds a policy with an emphasis on national markets (food security) and social inclusion rather than supporting the expansive and international ambition of private agribusinesses. A quota system limits the export of the agro-industrials and provides fixed prices for small farmers through public enterprises such as Emapa. It is a governance of public intervention, but it has not contributed to the legal security of landowners or to full commercial freedom for exporters.

Opportunities

Most current and future challenges in Bolivia are strongly related to improving the business environment and competitiveness. Necessities that can lead to cooperation or business opportunities are diverse in the sense of local awareness, financial dependency and government involvement. Examples include:

- Knowledge development: exchange of knowledge on academic and practical level.
- Environment and sustainability: e.g. water treatment, irrigation, research, integrated pest management.
- Biotechnology: animal genetics and seed improvement.
- Food safety & animal health: laboratory services, technology and training.
- Dairy: e.g. pre-coolers, processing equipment.
- Competitiveness & export: access to market, joint ventures, preservation/processing equipment.
- Livestock and poultry: technology to produce more efficiently, feed technology.
- Agro-commodities: storage and processing facilities.
- Institutional: Senasag, technical assistance, cooperative development.
- Finance: access to credit for medium sized companies.

Bolivia, and certainly Santa Cruz, counts with high ambitions in agricultural development. Many things are needed in Bolivia, but doing business successfully requires dedication and organisation. This makes Bolivia an interesting market for pioneers and organisations that know how to combine an opportunity with business development.

Resumen ejecutivo (Spanish)

En la última década Bolivia mostró un desarrollo significativo en la producción agrícola y la industria agroalimentaria. Un factor que contribuyó positivamente fue el fuerte crecimiento del PIB desde el 2006 hasta el 2015, apoyado por los altos precios del gas natural y los minerales. Mientras que los ingresos de minería y gas disminuyeron en los últimos años, el sector agrícola sigue siendo un motor económico muy valioso para Bolivia. Es un sector en el que las oportunidades son infinitas, pero con circunstancias locales divergentes y desafíos comunes de un país en desarrollo.

Informe factual

Este informe, asignado por la embajada holandesa en Lima, tiene como objetivo señalar los desafíos de la agroindustria boliviana, así como identificar oportunidades potenciales de cooperación bilateral en diferentes niveles del sector privado, las ONG y entidades públicas. Ciertas conclusiones pueden ser un motivo para una investigación más profunda.

El principal enfoque de este informe será el de los productos agrícolas, ganaderos y avícolas y sus negocios relacionados como los piensos, los productos lácteos y la carne. Sin embargo, también se examinan brevemente las posibles oportunidades de preservar frutas, cultivos de alto valor y procesamiento de alimentos.

Departamento de Santa Cruz

Santa Cruz es el centro del desarrollo agrícola, especialmente en cultivos masivos y la cría comercial. Las diferentes agroindustrias de esta región están bien definidas en organizaciones de ramas y productores que ejecutan proyectos y trabajan en estrecha colaboración con sus miembros. La mentalidad abierta de negocios y la motivación empresarial son características positivas para promocionar la cooperación potencial con sus socios holandeses.

Cultivos

La soja es el principal cultivo comercial, que domina tanto en la producción agrícola como en la exportación (principalmente aceite y torta). Otros cultivos relevantes son la caña de azúcar, el maíz, el trigo, el sorgo y el girasol, cada uno de ellos desempeña un papel importante en las diferentes cadenas agroalimentarias o de alimentación animal.

El potencial de Bolivia es grande gracias a la abundancia de tierras fértiles y diferente zonas climáticas. Sin embargo, Bolivia aún carece de competitividad debido a los bajos rendimientos. Por un lado, no se han adoptado los cultivos transgénicos y las semillas de calidad tanto como en los países vecinos. Por otro lado, las malas prácticas agrícolas, los monocultivos y el uso excesivo de agroquímicos provocan la erosión del suelo. Mientras tanto, la necesidad de una gestión adecuada del agua y del riego se ha convertido en una prioridad nacional, especialmente después de la sequía del 2016.

Avicultura, ganadería y productos lácteos

Los cultivos como el maíz y la soja son importantes insumos para la avicultura y ganadería de Bolivia, e indirectamente para la producción de carne y los productos lácteos. Las empresas más grandes tratan de mantener el control sobre los insumos al tener su propio almacenamiento y producción de alimentos balanceados. Sin embargo, más abajo de la cadena todavía están sujetos a una infraestructura y cadena de frío subdesarrollada.

La industria avícola ha experimentado el mayor crecimiento y ha alcanzado un nivel maduro en la producción y las tecnologías aplicadas. Existe espacio para aumentar aún más la eficiencia mediante la integración y la ampliación a escala. A diferencia de la industria avícola, las granjas de ganado son mucho más extensas y están menos tecnificadas, pero existe una perspectiva futura para incrementar la exportación de carne. La sanidad animal y el control sanitario son fundamentales. La industria láctea está bajo fuerte presión debido a

los actuales precios internacionales bajos de la leche. La calidad es otro tema importante en esta industria, en la que el proceso de producción es generalmente de baja tecnología y se compone de productores lecheros de todo tipo de tamaños. El potencial de crecimiento existe también en la industria porcina, ya que se espera un aumento en la tasa de consumo que actualmente es baja.

Forma de gobierno

El gobierno mantiene una política con énfasis en el mercado nacional (seguridad alimentaria) e inclusión social en lugar de apoyar la ambición expansiva e internacional de los agro-negocios privados. Un sistema de cupos limita la exportación de los agroindustriales y proporciona precios fijos para los pequeños agricultores a través de empresas públicas como Emapa. Es una gobernanza de intervención pública, pero no ha contribuido a la seguridad jurídica de los propietarios de tierras ni a la libertad completa de los exportadores.

Oportunidades

La mayoría de los desafíos actuales y futuros en Bolivia están fuertemente relacionados con la mejora del entorno empresarial y la competitividad. Las necesidades que pueden llegar a una cooperación u oportunidades de negocios son diversas en el sentido de conciencia local, dependencia financiera y participación del gobierno. Ejemplos incluyen:

- Desarrollo del conocimiento: intercambio de conocimientos a nivel académico y práctico.
- Medio ambiente y sostenibilidad: tratamiento de agua, riego, investigación, manejo integrado de plagas.
- Biotecnología: genética animal y mejoramiento de semillas.
- Seguridad alimentaria y sanidad animal: servicios de laboratorio, tecnología y capacitación.
- Industria láctea: pre-enfriadores, equipos de procesamiento.
- Competitividad y exportación: acceso al mercado, joint ventures, equipos para preservación / procesamiento.
- Ganadería y avicultura: tecnología para producir más eficiente, tecnología productiva de alimento balanceado.
- Cultivos masivos: instalaciones de almacenamiento y procesamiento.
- Institucional: Senasag, asistencia técnica, desarrollo cooperativo.
- Finanzas: acceso a crédito para las medianas empresas.

En Bolivia, y especialmente en Santa Cruz, se cuenta con grandes ambiciones en el desarrollo agrícola. También tiene muchas necesidades, pero hacer negocios exitosos requiere dedicación y organización. Esto hace de Bolivia un mercado interesante para pioneros y organizaciones que saben combinar una oportunidad con el desarrollo de negocios.

Managementsamenvatting (Dutch)

In de afgelopen tien jaar liet Bolivia een belangrijke ontwikkeling zien van de agrarische productie en agro-food industrie. Een positieve factor was de sterke groei van het BBP van 2006 tot 2015, ondersteund door de hoge prijzen voor gas en mineralen. Terwijl de mijnbouw en gas inkomsten in de afgelopen jaren gedaald zijn, blijft de agrarische sector een zeer waardevolle economische motor voor Bolivia. Het is een sector waarin de mogelijkheden eindeloos zijn, maar welke kampt met afwijkende lokale omstandigheden en de typische problemen van een land in ontwikkeling.

Fact-finding

Deze fact-finding, in opdracht van de Nederlandse ambassade in Lima, heeft als doel om een aantal van de uitdagingen in de Boliviaanse agrosector te belichten alsook om potentiële kansen te identificeren voor bilaterale samenwerking op verschillende niveaus van de private, non-profit en de publieke sector. Bepaalde bevindingen kunnen een motief zijn voor nader onderzoek.

De voornaamste focus van dit rapport zal zijn op landbouwproducten en veeteelt (runderen en pluimvee) en een aantal van hun aanverwante producten, zoals diervoeder, zuivel en vlees. De potentiële kansen in het conserveren van fruit, hoogwaardige gewassen en de verwerking van levensmiddelen worden ook kort beschouwd.

Departement Santa Cruz

Santa Cruz is het centrum van landbouwontwikkeling, en dan voornamelijk van commodity gewassen en commerciële veehouderij. De verschillende agro-industrieën in deze regio zijn goed vertegenwoordigd in brancheverenigingen en producentenorganisaties die projecten uitvoeren en nauw samenwerken met hun leden. De open mentaliteit en motivatie in het ondernemerschap zijn positieve eigenschappen voor de bevordering van potentiële samenwerkingen met Nederlandse collega's.

Gewassen

Soja is het belangrijkste commerciële gewas en domineert zowel de agrarische productie als de export (voornamelijk olie en perskoeken). Andere relevante gewassen zijn onder meer suikerriet, maïs, tarwe, sorghum en zonnebloem, die elk een belangrijke rol vervullen in verschillende Boliviaanse waardeketens in agrofood en diervoeders.

Bolivia's potentieel is groot dankzij de overvloed van vruchtbare gronden en verschillende klimaatzones. Desalniettemin ontbreekt het Bolivia nog steeds aan een goede concurrentiepositie als gevolg van lage oogstopbrengsten. Aan de ene kant wordt er minder gebruik gemaakt van transgene gewassen en kwalitatieve zaden dan door buurlanden. Anderzijds zijn slechte landbouwpraktijken, monoculturen en overmatig gebruik van landbouwchemicaliën een oorzaak van bodemerosie. In de tussentijd is de noodzaak van goed waterbeheer en irrigatie uitgegroeid tot een nationale prioriteit, vooral na de forse droogte in 2016.

Pluimvee, veeteelt en zuivel

Gewassen zoals maïs en sojabonen zijn belangrijke voedingsingrediënten voor de Boliviaanse veeteelt, en indirect voor vlees en zuivelproducten. Grotere bedrijven proberen greep te houden op deze producten doormiddel van eigen opslag en diervoeder productie. Echter, verderop in de keten zijn ze nog steeds onderworpen aan een onderontwikkelde infrastructuur en koelketen.

De pluimvee-industrie heeft de sterkste groei ervaren en een volwassen niveau bereikt in productie en toegepaste technologie. Het biedt ruimte voor een verdere verhoging in efficiency via integratie en schaalvergroting. In tegenstelling tot pluimvee zijn rundveebedrijven veel extensiever en minder technologisch, maar hebben een toekomstperspectief om de export van rundvlees te vergroten. Diergezondheid en sanitaire controle zijn fundamenteel. De zuivelindustrie staat onder zware druk van de huidige lage internationale melkprijzen. Daarnaast is kwaliteit een belangrijk onderwerp in deze industrie,

waarbij het productieproces over het algemeen van laag technisch niveau is en bestaat uit melkveehouders van sterk variërende grootte. Groeipotentieel bestaat er ook in de varkenshouderij, daar de consumptie momenteel laag is en naar verwachting verder zal toenemen.

Regering

De regering hanteert een beleid met de nadruk op de nationale markt (voedselzekerheid) en sociale integratie in plaats van het ondersteunen van de expansieve en internationale ambities van particuliere landbouwbedrijven. Een quotasysteem beperkt de export van de agro-industrie en biedt zekerheid en vaste prijzen aan kleine boeren door middel van overheidsbedrijven zoals Emapa. Het is een bestuur van publieke interventie, maar het heeft niet bijgedragen aan de juridische zekerheid voor grondeigenaren of volledige commerciële vrijheid voor de exporteurs.

Kansen

De meeste huidige en toekomstige uitdagingen in Bolivia zijn sterk gerelateerd aan de verbetering van het ondernemingsklimaat en het concurrentievermogen. Benodigdheden die kunnen leiden tot samenwerking of zakelijke kansen zijn divers in de zin van lokale bewustzijn, financiële afhankelijkheid en betrokkenheid van de overheid. Voorbeelden hiervan zijn:

- Kennis ontwikkeling: uitwisseling van kennis op de academisch en praktisch niveau.
- Milieu en duurzaamheid: bijv. waterzuivering, irrigatie, onderzoek, geïntegreerde plaagbestrijding.
- Biotechnologie: dierlijke genetica en zaadveredeling.
- Voedselveiligheid en diergezondheid: laboratoria diensten, technologie en training.
- Zuivel: bijv. pre-koelers, verwerkingsapparatuur.
- Concurrentievermogen & export: marktentree, joint ventures, conservering en verwerking apparatuur.
- Vee en pluimvee: technologie om efficiënter te produceren, diervoedertechnologie.
- Agro-grondstoffen: opslag- en verwerkingsfaciliteiten.
- Institutioneel: Senasag, technische assistentie, coöperatieve ontwikkeling.
- Financiering: toegang tot krediet voor middelgrote bedrijven.

Bolivia, en zeker Santa Cruz, heeft grote ambities in landbouwontwikkeling. Veel dingen zijn nodig in Bolivia, maar het succesvol zakendoen vereist toewijding en organisatie. Dit maakt Bolivia een interessante markt voor pioniers en organisaties die weten hoe ze kansen combineren met business development.

Bolivia in general

Food security is policy, export is the future

Facts Bolivia:

- Over 26 times larger in size than the Netherlands.
- 11 million inhabitants.
- Landlocked in between 5 neighbouring countries: Brazil, Paraguay, Argentina, Chile and Peru.
- Geographically divided into highland (southwest), lowland (east and north) and valleys in between.
- Sucre is the capital, but the government's administration is in La Paz.
- Santa Cruz has become the largest city before El Alto (#2) and La Paz (#3).

Source: wikipedia

Bolivia has been one of the fastest growing economies in Latin America during the last decade. Although natural gas and minerals are responsible for most of Bolivia's income, the agricultural sector is one of the main economic drivers of the country. Over 30% of Bolivian's labour force is involved in agriculture. There is a large potential for the extension of agricultural production. The internal market is limited, therefore export is an important factor to realize growth.

Export vs food security

The agricultural sector is most advanced in the region of *Santa Cruz*, where commercial farmers and agribusinesses are highly motivated to further develop their activities. Access to (new) markets and export are common objectives in the agri-food business. Smaller businesses seek more control over the commercialization of their crops, while medium and large companies invest in expansion or add value to their products. In short, four patterns of developments can be identified:

- Expand current activities
- Adding value
- New products
- Access to markets (export)

While an increasing number of companies are looking for export possibilities, the discourse of the national government is focused on food security. The administration of Evo Morales exercises control on the commercialization of agricultural commodities through quotas and public enterprises in order to secure national food supply and protect small farmers. Agribusinesses have the obligation to first fulfil local demand before they are allowed to export. Moreover, their production land must have a socio-economic function to guarantee their ownership.

Although several large Agri-food businesses indicated to be optimistic about recent policymaking, there is still awareness for sudden changes in government policy, especially when in need of public funding. It is a reality that makes entrepreneurship in Bolivia challenging and sometimes results in short term thinking.

Bolivian businesses: Open attitude towards solutions and opportunities
The fact that Brazil, Argentina and even Paraguay are in many ways ahead of Bolivia and many times bigger in agricultural export, is at the same time the principle opportunity in Bolivia: Nearly everything has to be developed in Bolivia. And the biggest advantage over the more developed countries is the level of motivation and openness of Bolivian businesses.
It is fairly easy to get in contact with companies, which are very receptive in learning about new opportunities and technologies that gives them a better advantage. Entrepreneurship in Bolivia is high risk but with potentially high returns. For many this is the reason to have a continuous urge to advance.

Quota

Export quota ('cupos') or specific export periods exist for most products, including maize, soybean, soybean derivates, meat, etcetera. Some products are exempt from strict quota, among which are quinoa and chia. Limitations in export prevent businesses in becoming reliable suppliers and acquire supply contracts.

Quota also exist in purchase contracts with public or former public organizations, which offer fixed prices and are meant to ensure a reasonable income for small farmers. Organisations such as Emapa and PIL Andina work with product quota. These product quota are sometimes transferable.

Bolivia is not a 100% free market, prices are regularly fixed or influenced by the government, such as soy oilcake or maize for feed, with the goal to maintain food (e.g. poultry) prices affordable for the consumer. Public intervention in pricing and a significant contraband of cheap import products from surrounding countries make the Bolivian agri-food industry little competitive.

Bolivian regions:

Santa Cruz leads agribusiness development

Bolivia is divided in highland or '*altiplano*' and (semi-)tropical lowland. In between there is an area of valleys with many different microclimates.

Santa Cruz region

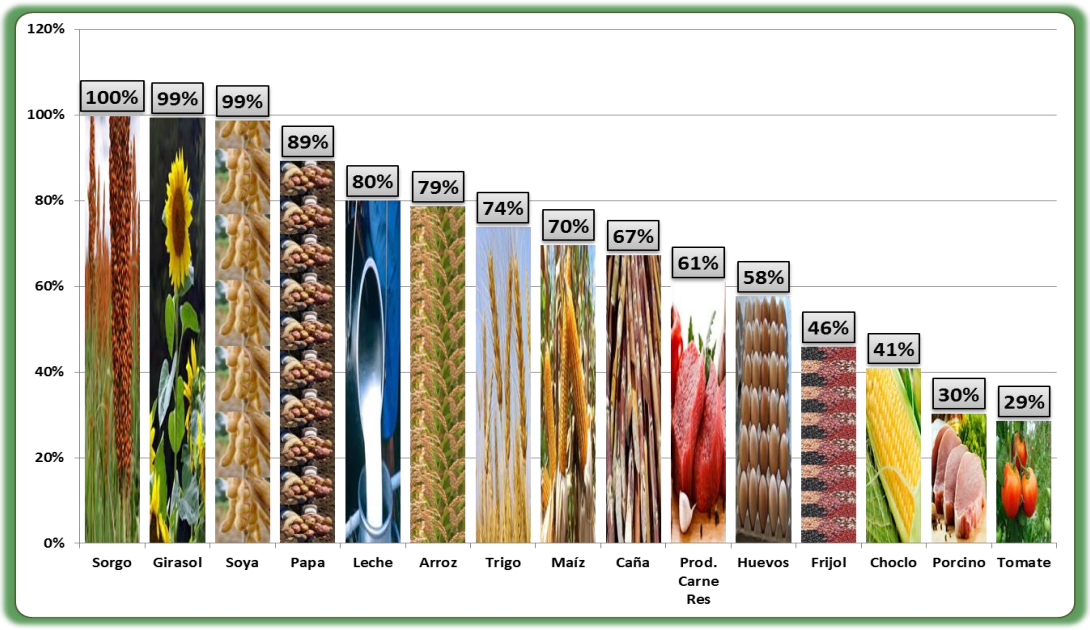
Santa Cruz is responsible for 70% of the national food supply, almost 30% of the GBP and 40% of the national tax income. In recent years Santa Cruz has expanded rapidly in arable land. Farmers of all sizes, from 1 ha to over 20.000 ha, contribute to a growing production and have created an estimated 1.5 million jobs in the agricultural sector. There has been a continuous migration of people from other regions and countries to Santa Cruz in search of economic opportunities and inexpensive land. This has led to an exchange in technological knowledge and agricultural practices.

Origin of producers in historic soybean production (in hectares and share in %)								
Producers	**1993-94**		**1998-99**		**2003-04**		**2008-09**	
Nationals	86,760	36%	131,760	26%	189,700	36%	301,715	43%
Brazilians	19,075	8%	166,700	33%	185,500	31%	175,886	25%
Mennonites	103,490	43%	142,330	28%	145,800	24%	113,116	16%
Argentinian	-		-		-		70,480	10%
Japanese	27,700	11%	37,800	7%	40,500	7%	32,044	5%
Other	4,768	2%	30,450	6%	40,500	7%	7,090	1%
Total	**241,793**		**509,040**		**602,000**		**700,331**	

Source: Tierra 2015

The business environment is highly institutionalized. Business owners are used to being organized in sector or branch organizations. The contrast of large agribusinesses with smallholders is emphasized by their superior technology and their highly integrated structure, often including proper storage, processing and investments in parallel industries. The corporate agro-industry in Santa Cruz is heavily focused on cultivating and processing soybean.

Production share of Santa Cruz region in agriculture in 2015



Source: INE, MDRyT, various subsectors; Elaboration: CAO-planning

Highland

Highland Bolivia is characterized by small scale farming. Smallholders and rural families focus on breeding llamas, sheep and cultivating suitable crops such as quinoa, potato and corn. Most is subsistence farming, except of quinoa which has become a popular export product.

One of the major problems in the region is the lack of water resources and financial strength. The highland region profits most from its natural resources (mining). Mining is also an industry that competes with agriculture for water.

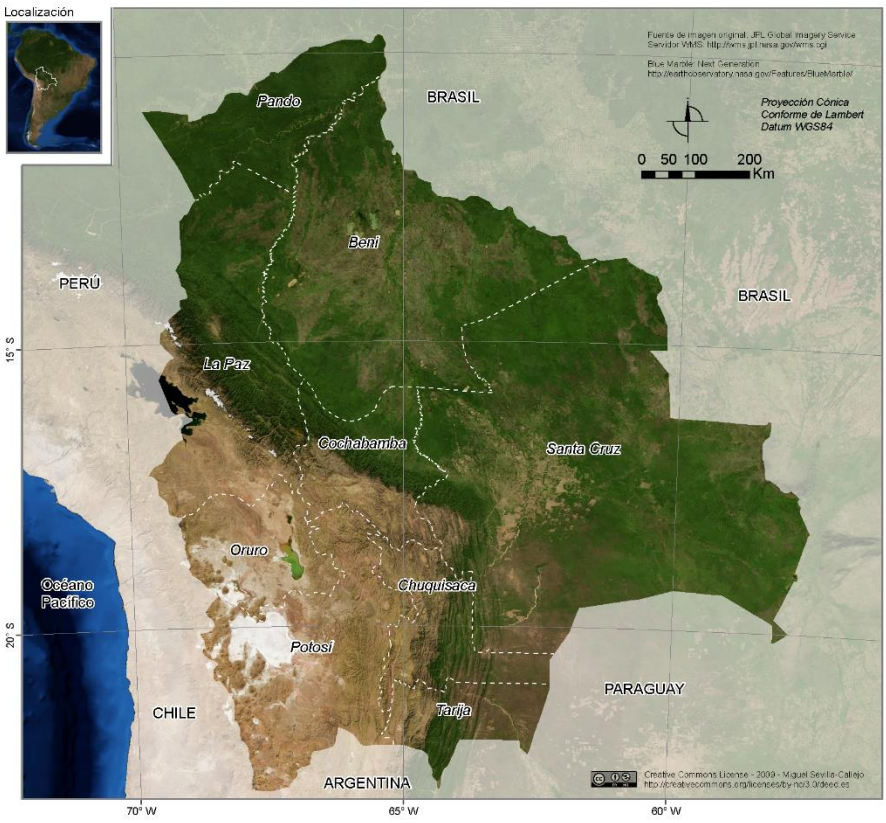
The Valleys

The diversity of microclimates in the valleys are very suitable for the cultivation of less extensive crops such as fruit, vegetables and coffee (mostly food crops). Tarija is well known for its grape and wine production. Cochabamba was originally destined to become the food production centre for the mining industry. The Bolivian valleys have similar problems with water as the highlands and productivity is generally low. This results in insufficient economic resources and low investment in technology. Many farmers in the valleys are small sized.

Better agricultural practices and water management can contribute in making this region more profitable. Technologies such as drip irrigation are still at its staring point.

Tropical north

Northern Bolivia consists of wet grasslands and jungle in the departments of Beni, Pando and the northern part of La Paz. In general the northern departments are less developed. The grasslands in Beni are suitable for extensive livestock breeding. According to industry sources cattle from Beni is often transported closer to cities such as Santa Cruz for fattening. Typical crops in this region are yucca (cassava), plantains, rice and brazil nuts.



Source: Wikipedia

Agricultural inputs

Towards a sustainable production

About 50% of the providers of agricultural inputs and agrochemicals (fertilizer, seeds, pesticides, generic and patented products) are represented in the association APIA, which is in turn member of CropLife Latin America. There is a strong link with large biotechnical multinationals such as Bayer, Monsanto and BASF. Besides the organized trade of agrochemicals, there is also a large number of informal suppliers that sell uncontrolled products. APIA strives for a formalization of their sector, but also stimulates sustainable agriculture with projects such as Campo Limpio ('Clean Field') and CuidAgro. The Campo Limpio Program achieved to collect 200 tonnes of agrochemical plastic containers in 2015. The company Cañoplast cleans and recycles a part of the containers, and transforms them into tubes. According to APIA the company Dutex is also starting to work on recycling.

Multinationals	Suppliers of seed	Suppliers of machinery / agrochemicals	Institutional
Monsanto	Semillas Mónica	Agripac	Anapo
DuPont Pioneer Syngenta	Agrosem	Mainter	INIAF
Dow AgroSciences	Semexa	Ciagro	Fundacruz
Bayer	Totai Semillas	Agrobolivia	APIA
BASF	Agrallia Agroindustrial	Saat srl	APRISA
	Cordillera	ABSA	
	Caico ltda	Agroinco	
	Caisy ltda		
	Brasem		
	Bolfarm		
	Agromil		

* More suppliers can be found via APIA or APRISA

Machinery

Bolivian Import of machinery (CIF) in 2014	Bolivianos (BOB)	Euros (exchange 1:8,9)
Tractors	534,875,763	60,098,400
Combine harvesters	224,513,136	25,226,195
Seeders	109,230,920	12,273,137
Harrows	48,540,777	5,454,020
Plows	24,606,912	2,764,822
Threshers	17,545,788	1,971,437
Mowers	4,609,095	517,876
Single-axle tractor	2,321,864	260,884
Fertilizing machinery	1,437,946	161,567
Total Machinery	**967,682,201**	**108,728,337**

Source: APIA

Agrochemicals & fertilizers

Agrochemicals that are allowed for usage in Bolivia are registered by Senasag. The list dates from 2011(!). Agricultural commodities such as soybean take in large amounts of chemicals, such as glyphosate and paraquat. Agrochemicals are applied manually, mechanically or by airplanes, depending on the size and the budget of the producer. Also an increasing amount of ammonium and urea is being imported. As of 2017 Bolivia expects to be self-sufficient in their need for urea thanks to a major investment in an ammonia/urea plant by YPFB.

Facts about the YPFB urea and ammonia plant	
Location:	Carrasco province, Cochabamba
Investment:	862,5 million USD
Builder:	Samsung Engineering Co. LTD
Gas consumption:	1,4 million cubic meters per day
Production:	756.000 metric tonnes of UREA per year
Markets:	10-20% local market and 80-90% export

Source: Yacimientos Petrolíferos Fiscales Bolivianos (YPFB)

Bolivian import of pesticides (CIF) in 2014	Bolivianos	Euros (exchange 1:8,9)
Herbicides	671,521,440	75,451,847
Fungicides	577,981,215	64,941,710
Insecticides	421,346,495	47,342,303
Fertilizers	329,339,989	37,004,493
Adjuvants	46,553,963	5,230,782
Total Pesticides	**2,046,743,103**	**229,971,135**

Source: APIA

Seeds

There is little phytosanitary and quality control on the import of seeds. Large quantities are contraband and not registered in formal imports. Bolivia's experience in seed technology is underdeveloped. The National Institute of Agricultural and Forestry Innovation (INIAF) is responsible for the registration and certification of seeds.

Bolivian import of seeds (CIF) in 2014	Bolivianos	Euros (exchange 1:8,9)
Corn	66,270,581	7,446,133
Sorghum	56,746,370	6,375,997
Sunflower	36,930,133	4,149,453
Soy	27,969,416	3,142,631
Grass	24,307,871	2,731,221
Vegetables	15,867,513	1,782,867
Watermelon	2,993,123	336,306
Fruits	1,775,776	199,525
Other	1,773,966	199,322
Condiments	398,679	44,795
Flowers	250,617	28,159
Oats	248,478	27,919
Potato	63,980	7,189
Sesame	56,062	6,299
Wheat	4,278	481
Rice	1,111	125
Total Seeds	**235,617,954**	**26,473,927**

Source: APIA

Agroindustry

The dependence of the commodity crops

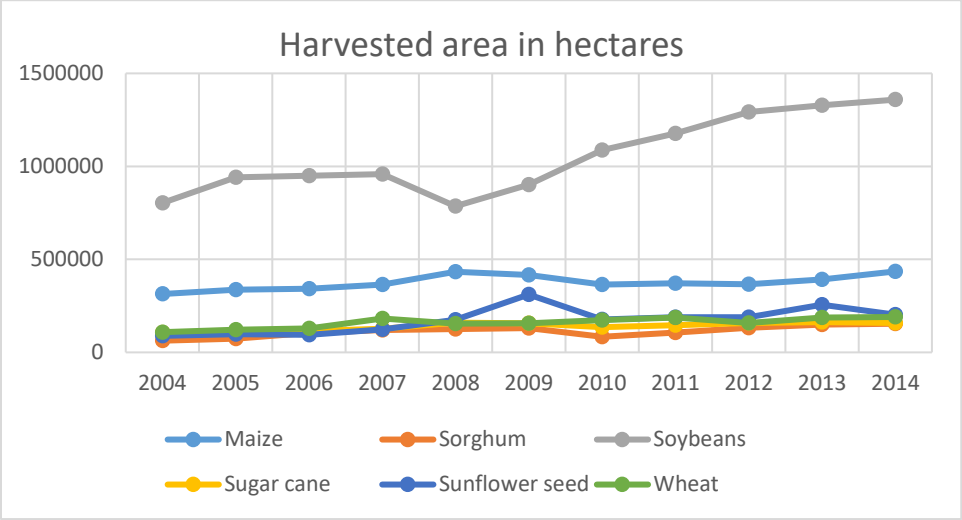
Important cash crops are soybean, sugar cane, maize, sunflower and wheat. Other significant crops are beans, sesame, quinoa (altiplano) and chia. Summer and winter crops alternate:

- Summer (may/june): Sugar cane, soybean, maize, rice, sesame.
- Winter (nov-march): Soybean, sorghum, sunflower, maize, wheat, chia.

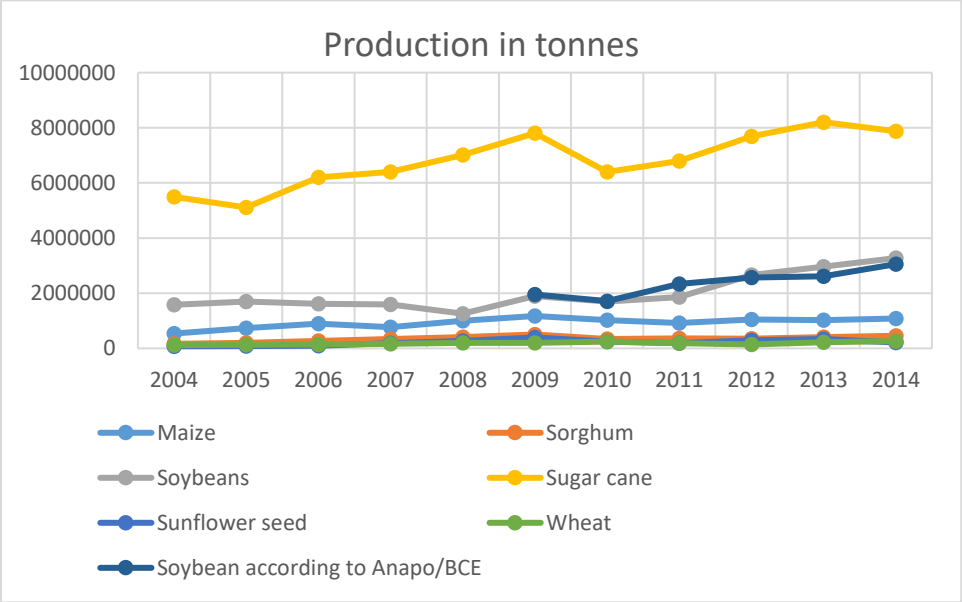
There is a tendency of monocrops. Soy has little rotation and sugar cane has no rotation at all, with soil erosion and excessive use of agrochemicals as a result. Only a part of the larger agribusinesses apply precision agriculture with the help of grid maps, satellite images or drones. Most drones are sold in Santa Cruz, where an estimated 15-20% of the total production area is monitored by drone technology.

An important observation is that, while Bolivia is expanding its production of large scale commodities, the country is becoming increasingly dependent on the import of food products such as tomatoes, onions, potatoes and wheat.

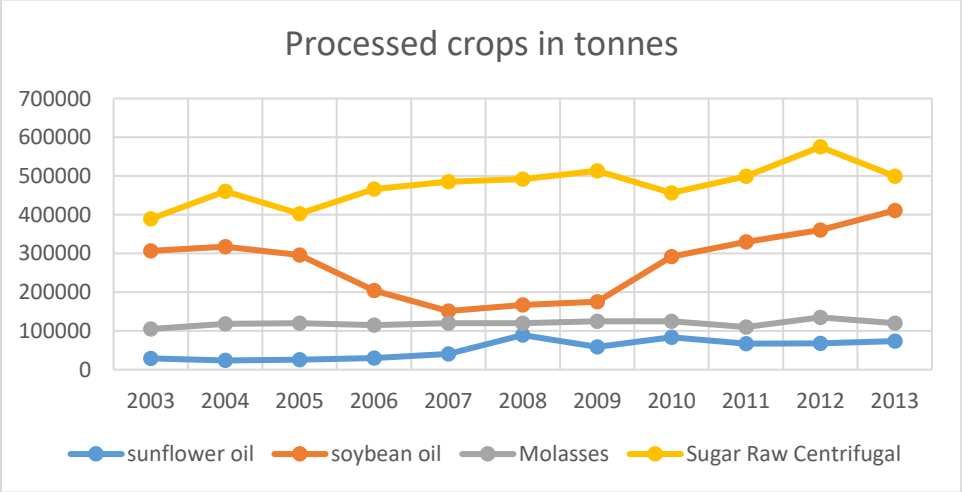
Grain storage



Source: Faostat, Bolivian statistics



Source: Faostat, Bolivian statistics



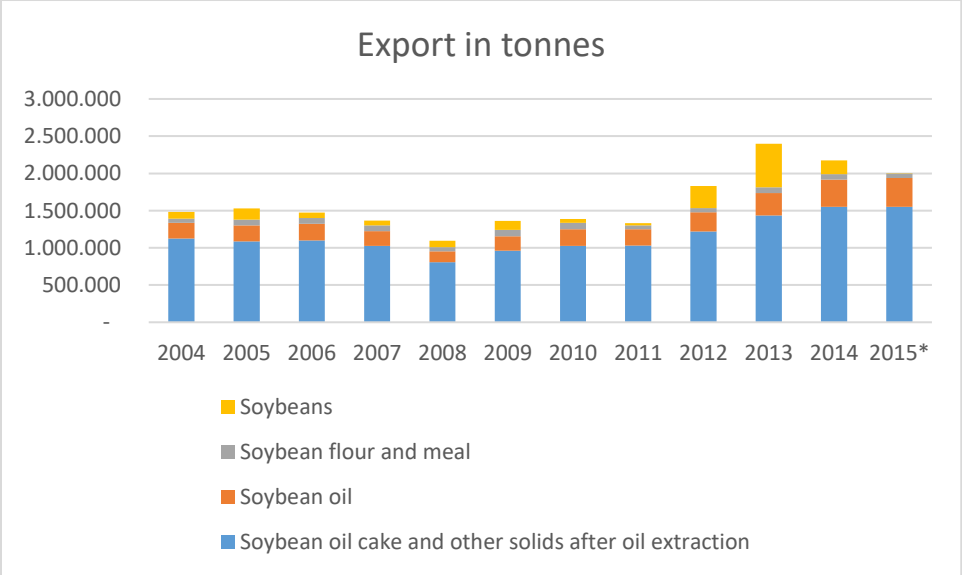
Source: Faostat, Bolivian statistics

Soybean

The leading crop in agribusiness development

Soybean is the leading crop in Bolivia and an economic driver for its economy. Around 20% is obligatory sold on the local market as feed to livestock breeders. The rest of the 3 million tonnes of soybean are processed and exported as oil and oilcake. The enormous global demand ensures farmers of a relatively secure market. This has boosted private investment and the production area of soybean significantly over the past decade.

In the northern part of Santa Cruz soybean is technologically most advanced and has almost become a monocrop, where two harvests per year are possible, but cultivation is relatively expensive due to fertilization costs. The eastern part of Santa Cruz has much more natural fertility but less rainfall than in the north.

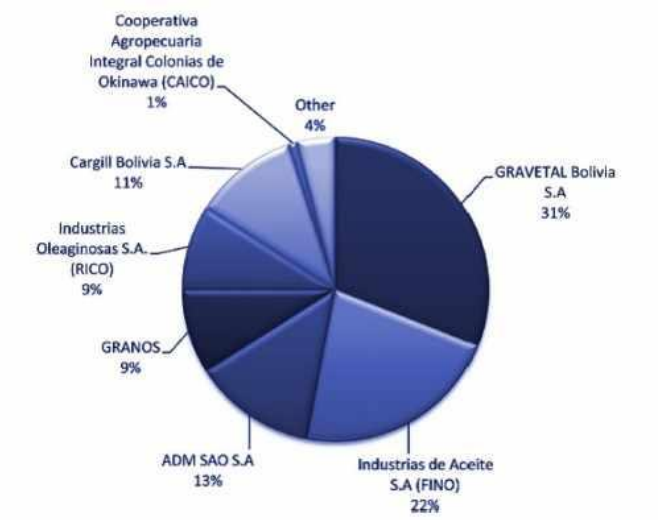


Source: ITC Trademap, Bolivian statistics
* Statistics of 2015 are not yet confirmed

Large industry, small farmers

Agroindustry (oil, oil cake, flour)	**Producers**	**Institutional**
Gravetal Bolivia (Colombia)	Mónica S.A.	Anapo
Industrias de Aceite (Fino)	Agrosem	
ADM SAO (multinational)	Intergrain S.A.	
GRANOS	Etasa Crisol	
Industrias Oleaginosas (IOL)	Granos del Oriente SRL	
Cargill Bolivia (multinational)	El Productor SRL	
CAICO		
CAISY		

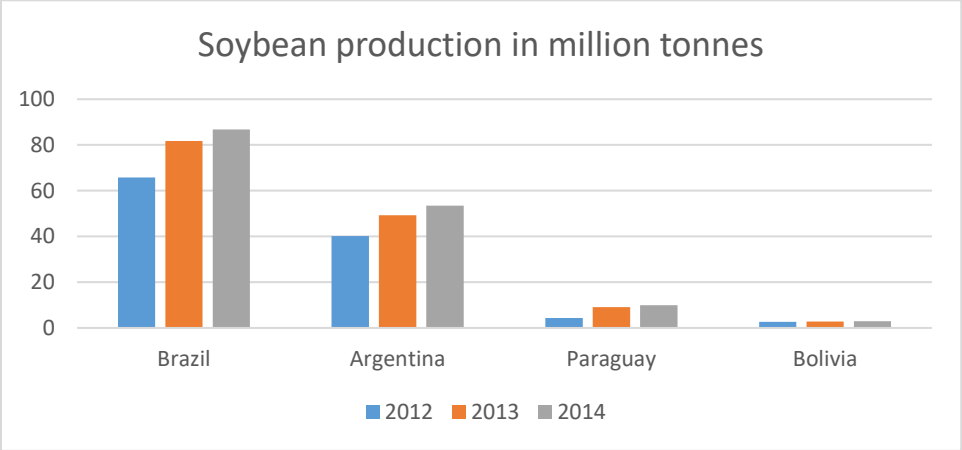
There are 14,000 producers of soybean, almost all located in the department of Santa Cruz. About 80% are small producers, most of which do not have their own storage facilities. These producers depend on the large companies and multinationals and have little opportunity to speculate on pricing themselves. The producers association Anapo supports the negotiation process. Larger companies as well as multinationals such as ADM SAO, Fino and Industrias Oleaginosas have invested in processing plants to produce oil, oil cake and flour.



Source: El Pais Online

Bolivian soybean still far behind Brazil and Argentina

Bolivia has positioned itself on the international soybean market next to the mega-producers in their neighbouring countries. Since 2005 Bolivia has made the conversion from conventional soybean to transgenic soybean. Nowadays almost all soybean in Bolivia is transgenic. Compared to Brazil, Argentina and Paraguay the yields are still lower as Bolivia mainly uses older GMO types, such as the RR1 soybean seed.



Source: Faostat, Bolivian statistics

The negative effects of soybean

The strong growth of the soybean industry is also related to a number of serious problems:

- Increasing soybean production is the principle cause of deforestation;
- Soil erosion due to low rotation and poor agricultural practices;
- Resistant undergrowth and excessive pesticide use;
- Vulnerability to diseases.

Unfortunately, many of these problems do not create a sense of urgency with farmers and remain unsolved. Meanwhile, more experienced farmers admit that "they are crazy" to have such a mentality. For small farmers it is more important to improve their access to markets through independent silos or better cooperative systems.

Sugar cane

The most industrialized crop

Sugar cane is not the largest crop in hectares, but with 8 million tonnes of raw product it is significant in production. Sugar cane in Bolivia is one of the most industrialized agricultural products and besides producing raw sugar and ethanol, the crop has a great biomass potential. Sugar cane refineries ('*ingenios*') such as Guabirá, Unagro, Aguaí and Easba are already generating electricity through biomass and partly supplying the national network. The cultivation of sugar cane requires less use of agrochemicals than most other crops. But there are many other characteristics that pose major environmental and social risks:

Environmental: Monoculture, pre-harvest burning and industrial processing have great impact on the soil and water quality. Only 30% uses fertilisation and only few have implemented irrigation systems. With irrigation and fertilisation technologies sugar cane farmers could improve their yield and take better care of their soil. In sugar cane processing the enforcement to combat pollution is insufficient, making sugar cane one of the main water polluters. Anticipating on the increasing water pollution and the inevitable intervention of the government, the need for water treatment technology will become more urgent.

Social: In despite of the high level of processing, much of the sugar cane harvest is done manually. According to the International Labour Organization (ILO) and the International Research on Working Children (IREWOC) abusive recruitment, debt bondage and child labour were common practices in the sector for many years. Solidaridad reported that in recent years the number of child labour has been reduced from 8,000 to less than a 1,000. Mechanisation has also helped reduce poor labour practices: a small majority of the Santa Cruz harvest has been mechanised.

Santa Cruz dominates the sugar cane industry

Sugar cane production is principally concentrated in Santa Cruz. With 130,000 to 140,000 hectares and 5 large sugar plants Santa Cruz dominates 90% of the sugar cane cultivation and sugar production.

In 2016 the cultivation area was for 73% managed by 553 larger farms (>50ha), while the rest of the land was cultivated by 2,103 small and medium producers. Since then the cultivation area has almost doubled and nowadays there are several large producers with over 1,000 hectares.

Farm size and share in sugar cane cultivation
2016

	Number of producers	%	Hectares	%
Small (<20ha)	1,448	55%	14,639	11%
Medium (20-50ha)	655	25%	21,548	16%
Large (>50ha)	553	21%	95,938	73%
Totals:	2,656	100%	132,125	100%

Source: Organización de Técnicos de la Agroindustria (OTAI), Elaboration: CAO-SIPREM

The sugar cane mills and refineries started to arise around the 1950's. The processing is concentrated in a few industrial complexes. Large processors in Santa Cruz are Unagro, Guabirá, San Aurelio, Aguaí and La Bélgica.

Sugar cane industry	Institutional
Unagro Guabirá San Aurelio (CIASA) Aguaí La Bélgica Bermejo (Tarija) San Buenaventura (Easba) (La Paz)	Association of sugar cane producers (Asocaña) Federation of sugar cane producers Santa Cruz (F.C.S.C.) Asociación of sugar cane producers Soca

Maize

An important feed crop

Livestock and poultry in Bolivia depend on a wide offer of affordable maize. Until today, Bolivia is not competitive with its production of maize. Lack of innovation and improved seeds result in low yields and a variety of diseases. Officially the cultivation of transgenic maize is not permitted in Bolivia, but a large quantity of uncontrolled contraband seeds enters the market from surrounding countries such as Argentina. The government attempts to regulate the market for maize, but the general opinion indicates that Bolivia needs to advance in biotechnology.

Good soil management could also improve production, for example by combining maize with grass to protect the soil with a cover and maintain humidity.

Sorghum

Principally used as rotation crop

Sorghum is an important rotation crop and serves principally as a protective and fertile bedding or stubble for the next crop. At the same time it can be used as animal feed. Its production has increased thanks to the poultry industry but commercially it has less importance than other commodity crops.

Wheat

A permanent shortage as food source

Wheat is considered a crop that is strongly related to food security. The production area of wheat has increased, but yields are far below average compared to surrounding countries. Due to the tropical climate and wheat blast disease (Pyricularia) the cultivation of wheat in Bolivia is challenging and not always profitable. This has resulted in a production volume that is insufficient to meet the local demand. Bolivia imports wheat from Argentina and the United States to compensate its shortages. By using better seeds and conducting more investigation, Bolivia hopes to improve its wheat production.

Sunflower

The second crop for the vegetable oil industry

Sunflower seeds are destined for the vegetable oil industry. Many of the soybean refineries also process sunflower. In recent years the motivation of farmers to grow sunflower has been low. White mold (Sclerotinia) and birds are negative influences on the production. Similarly to maize and wheat, producers demand more investigation and seeds that are resistant for diseases. Some farmers use laser technology against birds, although in practice it has been only partly successful.

According to the producers association Anapo, the production of sunflower is decreasing. They report lower production figures in 2014 than the FAO; 97,500 against 208,000 tonnes. According to Anapo, the productive area increased again to 140,000 ha in 2015, but only 66,000 ha was in good conditions.

National production of sunflower seeds 2011 - 2015			
Year	**Area (ha)**	**Yield (tonnes/ha)**	**Production (tonnes)**
2011	216,818	0.9	194,040
2012	280,000	1.03	287,020
2013	190,000	1.04	197,740
2014	95,000	1.03	97,500
2015	140,000*		

Source: Anapo - *Only 66,000 hectares were in good conditions

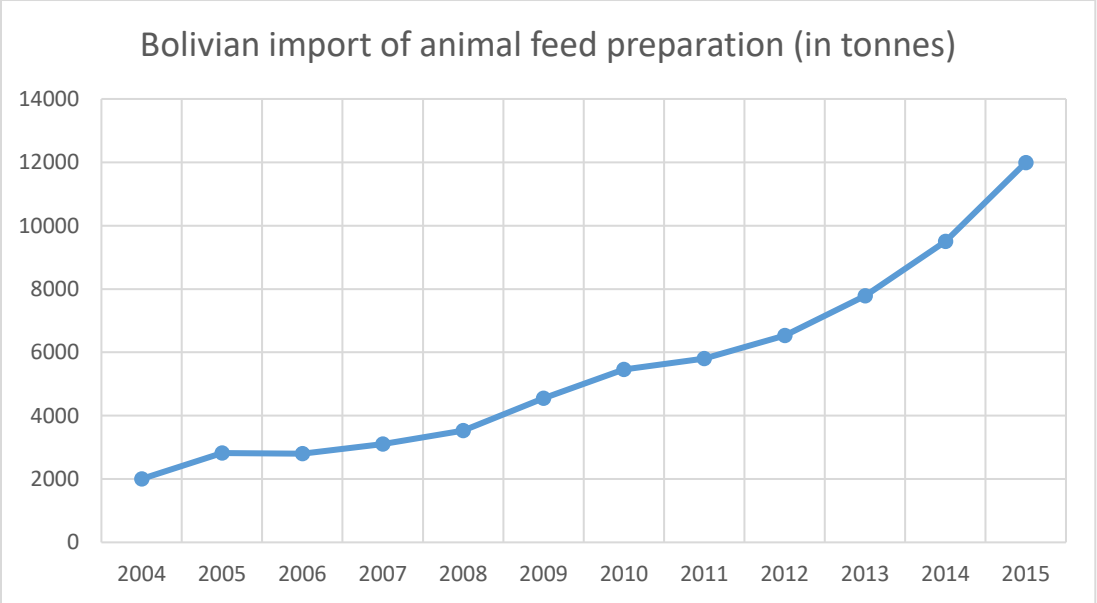
Feed

Unmissable, but not a core business

Soybean, maize and molasses are important commodities for animal feed in Bolivia. Although you would expect a thriving feed industry in Bolivia, the production of feed is not seen as a core business. Large companies such as Sofía (poultry), Imba (poultry) and ClaraBella (dairy) have installed their own feed mills. These are the type of companies that require feed technology and knowledge for their livestock production. For them it is interesting to have their own reliable and affordable feed source. Others depend on third parties or grain collectors with simple feed mills, often low-tech, or feed importers. For grain collectors ('*acopiador*') feed production is never a core business; they consider collection and speculation to be much more profitable.

Dependency on external feed sources

Increasing imports of feed confirm a growing livestock sector, but it also indicates that there is an increasing dependency on external feed sources. Bolivia mainly imports feed preparations from Argentina. According to Alltech global feed survey data Bolvia also showed a 16% increase in feed production, but with 1.86 million tonnes it is still a fraction of the production in Brazil and Argentina.



Source: ITC Trademap

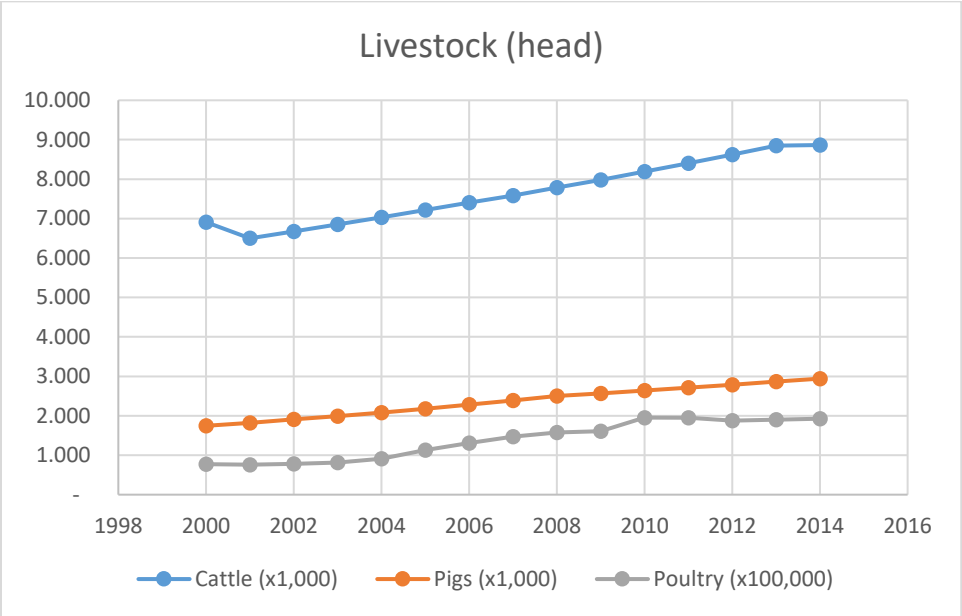
Feed production (in million tonnes)	
Brazil	66.15
Argentina	11.80
Chile	6.19
Peru	4.55
Bolivia	**1.86**
Uruguay	1.42
Paraguay	0.48

Source: Alltech 2015 Global Feed Survey

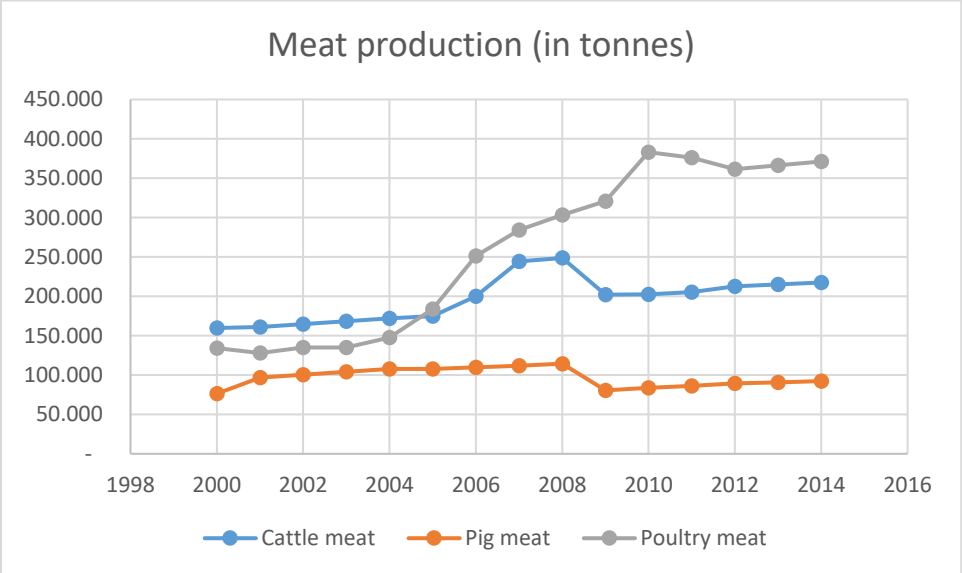
Companies	Public enterprise
Totalpec Central de Insumos Nutrex	Emapa

Poultry farm

Cattle ranch



Source: Faostat, Bolivian statistics



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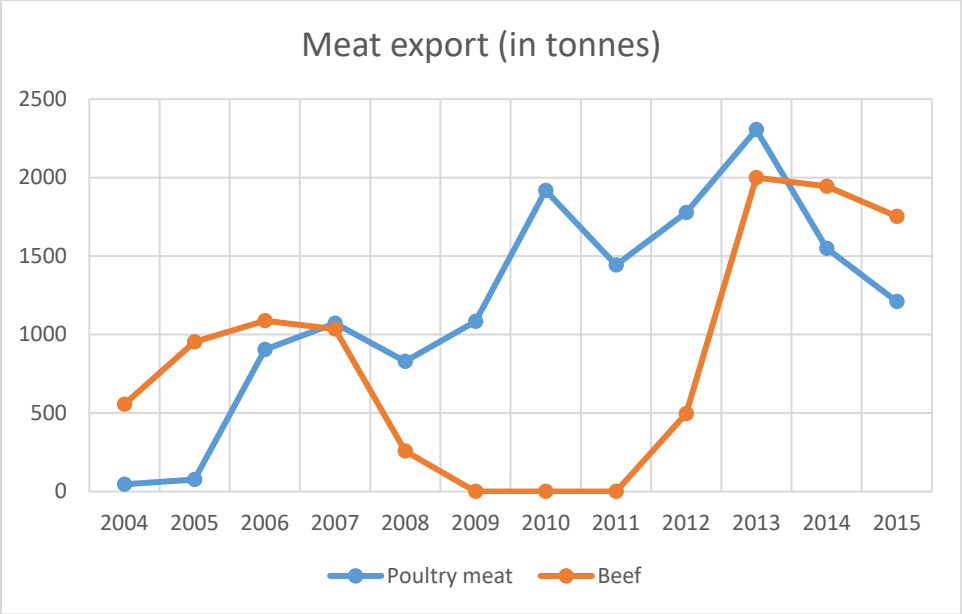
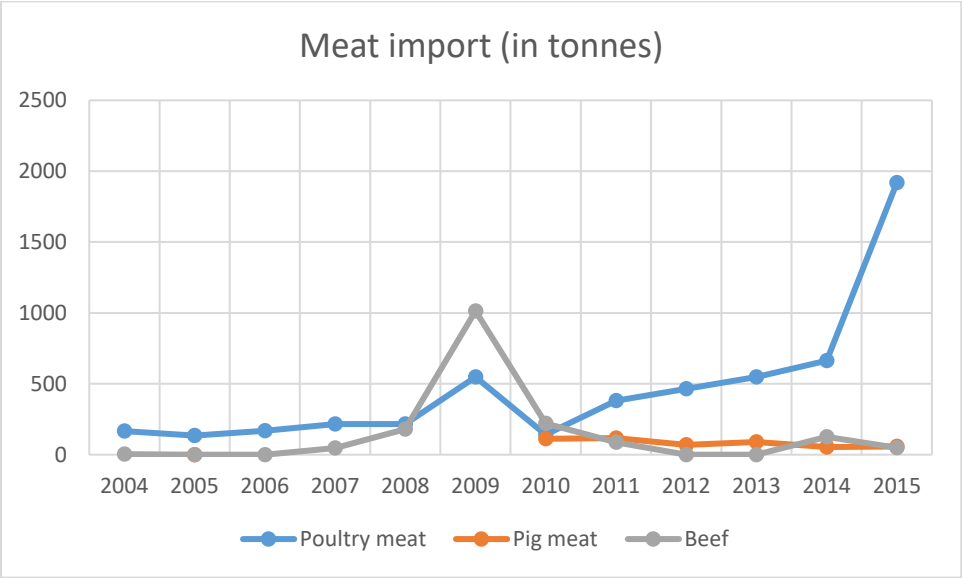


Source: ITC Trademap, Bolivian statistics



Source: ITC Trademap, Bolivian statistics

Poultry

A mature industry with potential for scaling and integration

According to industry sources the market for poultry is mature. Santa Cruz became the largest poultry producer in 2013 with a market share of 51%. Cochabamba maintained a market share of 42%. Santa Cruz may have become the specialist in poultry breeding, Cochabamba is better positioned with broiler farms and slaughter houses to supply La Paz, a large consumer market.

A census in Santa Cruz in 2011 concluded that the majority of poultry farms had less than 10,000 chickens. Nowadays, medium producers in Santa Cruz are believed to have generally between 40,000 and 60,000 chickens per cycle. Large producers reach numbers of 120,000 chickens or more. Large farms have become bigger, while the average number of broilers has remained low due to a greater number of small farms.

Logistics (road blocks), overproduction and high cost of feed are some of the main challenges in the supply chain.

BROILER farms in Santa Cruz					LAYING HEN farms in Santa Cruz	
Classification	Establishments	Share	Conventional	Acclimatised	Establishments	Share
Small <10k	718	64%	1,001	0	133	53.6%
Medium 10-50k	328	29%	1,042	18	106	42.7%
Large >50k	68	6%	382	191	9	3.6%

Source: Censo Avícola Comercial 2011 en el Departamento de Santa Cruz - Bolivia - 2011

Poultry farms per segment in Santa Cruz				
	Establishments	Sheds	№ of chickens	№ of producers
Broiler	1,114	2,634	11,257,582	880
Laying hen	248	1,234	3,504,623	227
Reproduction	37	293	1,428,208	24
Incubation	26			26
Double purpose	15	18	3,486	15

Source: Censo Avícola Comercial 2011 en el Departamento de Santa Cruz - Bolivia - 2011

Egg producers	Broiler producers and commerce	Institutional
Caisy (SCZ)	Sofía	Asociacion de Avicultores Avipar
Avícola Rolon (CBBA)	Avesca (Imba)	
Avícola Modelo (CBBA)	Piorico	Asociación de Avilcultores de Santa Cruz (ADA)
Carger (SCZ)	Avícola Modelo	
Inacruz (SCZ)	ALG Grupo Avícola Navallo	
F. Suarez (SCZ)	Proavi	Asociación de Avilcultores de Cochabamba (ADA)
Avícola Mónica (SCZ)	Avícola Rolon	
Avícola Vargas (CBBA)	Avícola R&R	
Adolfo El-Hage (SCZ)	Caisy	Asociación Nacional de Avicultores (ANA)
Avícola Sebastian (SCZ)	Pio Lindo	
Avicola Hurtado (SCZ)	Inavi	
Avícola M. Humbolt (SCZ)	Avisur	
ALG (CBBA)		
Avícola Felicidad (CBBA)		

*For an overview of poultry farmers in Santa Cruz, see ADA associates in Santa Cruz

Technological progress

The sector has developed itself successfully thanks to:

1. The application of advanced technologies;
2. Vertical integration;
3. Economies of scale.

Technology and scaling: The intensive nature of poultry production provides opportunities for technology. Large poultry farmers look globally for specific technologies from suppliers such as Agro Marau, Plasson, Chore-time, Meyn , Marel (Stork poultry) and Salmet. There is interest in scaling with multilevel farms and further integration of the industry.

Technology and efficiency: Automation and acclimatisation are considered important factors to increase efficiency. Acclimatisation can help reduce the mortality rate, which can be as high as 8 to 10% because of the tropical temperatures. Another determining factor in cost efficiency is raw material, which can be a major expenditure for production. This is the reason for large poultry brands to invest in their own storage and feed lines.

Technology and vertical integration: The number of farms with incubation and breeding technologies is increasing in Bolivia (especially Santa Cruz), but there is still a significant import of chicks (≤185 g) of around 4 million euros and the import of fertilised eggs has increased from 590 thousand euros in 2012 to 3.2 million euros in 2015. Brazil and Peru are the principle suppliers, among which are San Fernando (Peru), Aviagen do Brasil, Avicola del Norte (Peru) and ISA Hendrix Genetics LTDA (Dutch-Brazilian).

Consumption and export

News media sources suggest that the poultry consumption increased 6.7% from 2010 to 2015 to 34.7 kg per person. But the local market does not require a high quality product and cannot absorb the surplus production. Export could increase investment in quality. Current export is of poultry meat is possible to Peru, which amounted to 1,211 tonnes in 2015. Other export will depend on governmental policies and phytosanitary support by Senasag.

Poultry processing

There are only a few automated slaughter houses, likely not more than 10. According to poultry entrepreneurs probably more than half of the commercial chickens are slaughtered manually or in a clandestine manner, without any type of food safety control.

Poultry processing is still a niche industry. Frozen chicken, for example, is not really developed in Bolivia and with good reason: Brazil is a very large provider of frozen chicken, and as long as Bolivia remains a fresh market, the competition from Brazil will be limited. Only the larger poultry brands have tunnel freezers. While having a minor focus on frozen poultry meat, the market also experiences more fluctuations.

Secondary products are bone flour and feathers. There are also opportunities to compost chicken manure, but knowledge about characteristics and application should be further developed to make it commercially viable. Chicken manure is often also applied directly in farming without composting.

Sofía supplies 25% of Bolivian chicken

The company and brand Sofía maintains 25% of the poultry market (and 15% of the pig market). The company is diversified and has invested in high quality equipment.

With 10-12 medium-large associate producers, Sofía reaches 30 million broilers per year (5 million per cycle). All their producers are required to have climate control and their own water sources. Sofía provides the chicks, feed and advice (including on farm design). The company has 4 feed plants for 100,000 tonnes of grains, and also a new modern plant for pet feed. Grains are locally sourced – the government normally does not allow for import.

Important business drivers:
- Reliable inputs of raw material
- Quality equipment

Poultry farm

Poultry brands

Cattle

Higher Standards can facilitate beef export

Beni and Santa Cruz control over 70% of the livestock. Beni is much less advanced than Santa Cruz, but offers a good place for extensive breeding on its tropical grasslands.

Developments are taking place at a fast pace: Traditional farms are becoming professional breeders with better planning and more specialization. There are indications of a regional specialisation of cattle being bred in the north (Beni) and as they are maturing calves are moved closer to the city of Santa Cruz for rearing and fattening in feedlots.

According to experienced people in the business, a decent size of a cattle farmer is 1000-5000 cattle heads, but the larger farms manage 10,000 to 20,000 heads or even more.

	Total number 2013	Total number 2015	Breed	Medium and small farmers	Large farmers
Bolivia	8.8 million	8.1 million (100%)	85% Zebu & Criollo breed 8% Dairy breed 7% Genetically improved breed	n.a.	n.a.
Santa Cruz	3.2 million	3.5 million (44%)	42% Zebu Nelore breed 20% Zebu Mestizo breed 2% other breed 16% Dairy breed 19% Genetically improved breed	24,000	5,000
Beni	3.1 million	2.6 million (32%)		7,600	400

Source: La Razon 2013; El Día 2015

Conditions for quality cattle farming

Cattle farming has growth potential: Bolivia has both affordable, fertile land and the necessary ingredients for feed. The Bolivian Brangus association argues that the current 8.5 million heads could, in time, potentially increase to 14 million if external markets can be reached.

Because Bolivia is not used to high standards and the national market does not require premium quality, many cattle breeders still need to learn to manage their operations at international standards. Small farmers sometimes lack basic facilities such as water wells. Important focus points for the sector to realise more export, include:

- Better logistics;
- Control of animal health (free of food and mouth disease) and vaccinations;
- Gaining knowledge on pastures and genetics;
- Export standards and application of norms (this should be coordinated by the ministry).

Companies	**Institutional**
Fridosa	Federación de Ganaderos de Santa Cruz (Fegasacruz)
Frigor	La Federación de Ganaderos del Beni (Fegabeni)
Chiquitano	Asociación Boliviana de Criadores de Cebú (Asocebu)
Frigorifico Santa Fe	Asociación Boliviana de Brangus (AB-Brangus)
La Sociedad Comercial Agropecuaria Tusequis | Stege	La Confederación de Ganaderos de Bolivia (Congabol)

Suppliers to the cattle can be found on: Portal Boliviano de Ganaderia

Production standards

On Bolivian cattle farms there is little automation, mainly because farms are often extensive and far away from any technical assistance, but also because workers are not skilled in automated processes.

What is more important for cattle farmers are genetics and feed planning. The wealthier farmer uses high quality breeds and invests in the feeding process. For the feeding and fattening of livestock, farmers use different techniques such as creep feeding and auto-consumption silos ('*silos de autoconsumo*'). Auto-consumption silos stock fodder under plastic that is slowly removed, which is a simple way to feed cattle during droughts when pastures are poor. There is also an increasing number of feedlots near Santa Cruz.

Meat processing and consumption

The local distribution of beef consists for 90% of carcasses that are cut up at markets and supermarkets. The local markets for deboned and processed meat are still in development. The meat consumption is gradually increasing reaching 20 kilos per capita in 2013 and with an ambition within the sector to increase this to 25 kilos in 2025.

According to the leading abattoirs ('*frigoríficos*') there is still much improvement needed in quality. It all starts with good animal health at the farms. But the high level of informality also results in an incomplete cold chain and many artisanal slaughter houses that operate with low standards and little control by authorities.

The most advanced processors organise their own supply chain as far as possible and use imported equipment from Brazil or Argentina, packaging technology from, for example, the German company Multivac and water treatment technology from the United States. These companies have started to export meat, as well as hides and grease.

Export is the future

Special cuts for export is a relatively new business. At the moment most exported meat goes to Peru (1,753 tonnes in 2015). Export restrictions hinder Bolivian exporters in becoming reliable international suppliers. But Bolivian abattoirs are optimistic that their lobby will improve public sanitary services and export quota. In 2015 export quota for meat was increased from 2,000 to 7,000 tonnes. International markets will become crucial for the meat industry in the future.

With the Brangus breed, a mix between Angus and Brahman, Bolivia has a potential export product to compete with quality suppliers from other South American countries. The association for Brangus maintains a register of the Brangus bulls that ensures control and traceability through the use of chips and certifications. They represent around 16 breeders of reproductive bulls.

Fridosa and Frigor: Export is the future

Two of the most professional abattoir and processing companies are Fridosa and Frigor. These large companies are well organized and technologically advanced. Although very aware of the challenges in Bolivia, they are optimistic about a steady development towards export. They are the type of companies will lead the way in the Bolivian meat industry, on a local and international level.

Important business drivers:
- Animal health
- Professionalization of the food safety authority Senasag
- Amplification of export quotas

Dairy

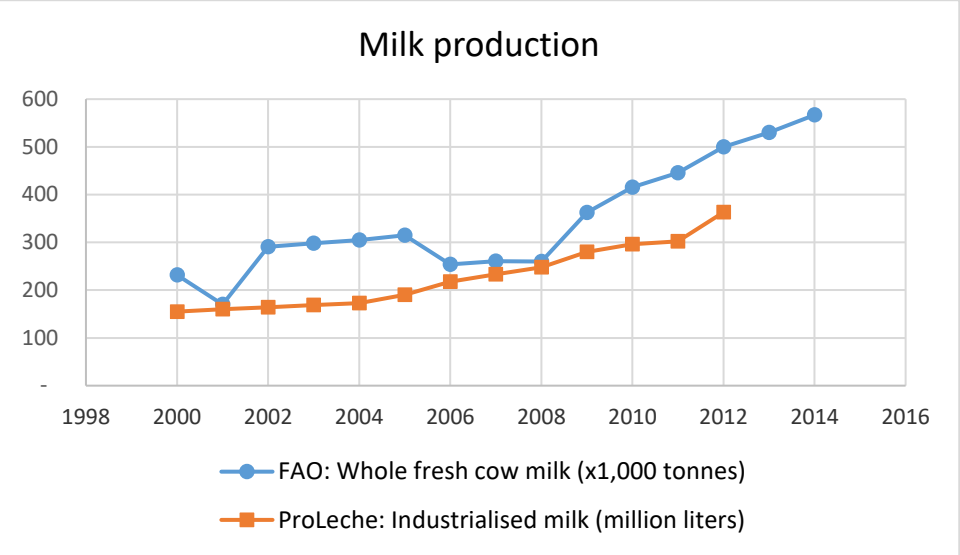
A complex industry with high ambitions and big challenges

There has been an increase in dairy farming and milk production over the last years, but statistics are variable. Notiboliviarural.com estimated that there were 15,000 dairy farms in Bolivia in 2012, of which 6,000 were in Santa Cruz, with a total milk production of 1.4 million litres a day. The agricultural census in 2013 (Censo Agropecuario 2013) indicates numbers that are much higher. In 2014 yet another statistical estimation was provided by the CAO. According to the latest news, in the year 2015 Santa Cruz and Cochabamba reached an overproduction of 220,000 litres per day.

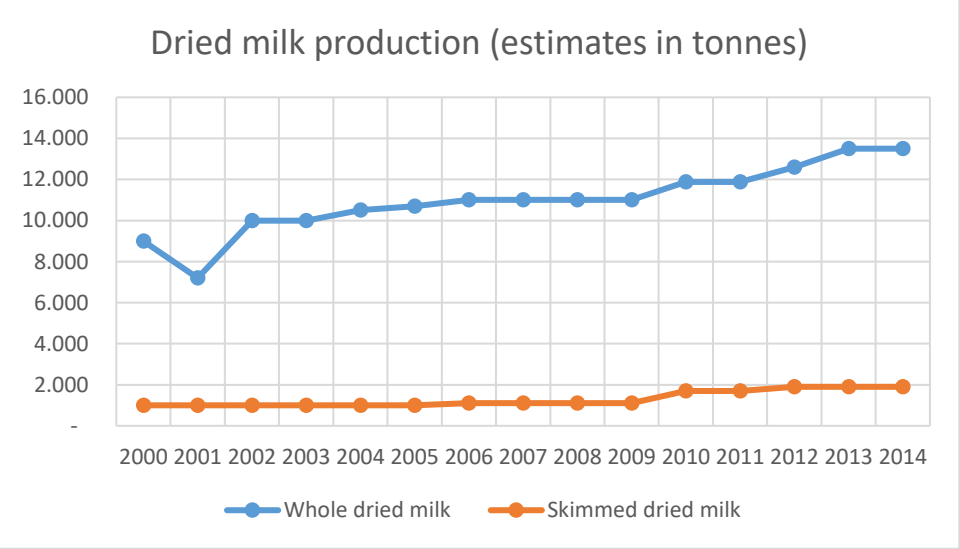
	2012: Notiboliviarural.com			**2013: Censo Agropecuario**					**2014: CAO Números de nuestra tierra**	
	Dairy farmers	million litres / day		Dairy farmers	Milking cows	million litres / day	Mecha-nised		Dairy farmers	million litres / day
Bolivia	15,000	1.4		77,477	382,561	2.3	2,355		13,919	1.5
Santa Cruz	6,000	0.85		23,082	204,429	1.3	1,077		1,809	0.75
Cochabamba				12,270	36,611	0.37	1,026		3,758	0.51
La Paz				29,457	65,229	0.28	47		6,820	0.20

* NB: Statistical data should be considered as indicative only due to strong deviation

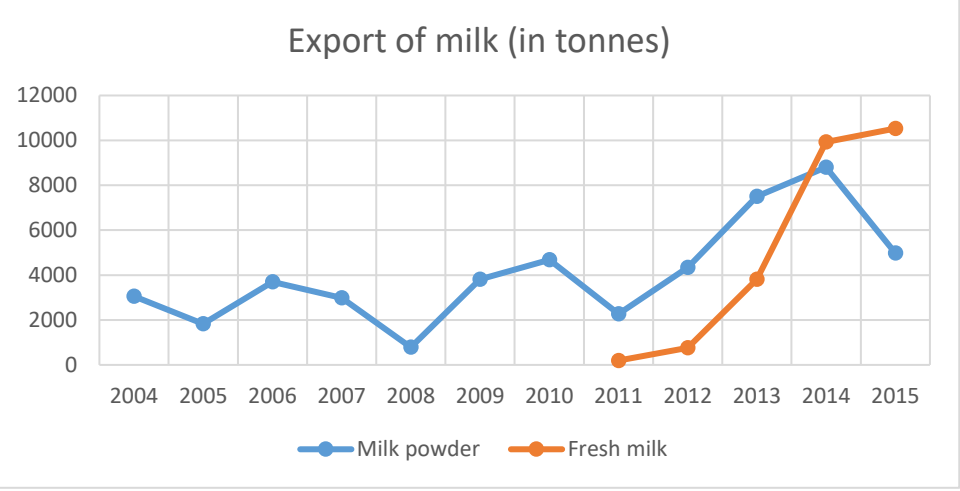
Feed stable for cattle



Source: FAO; ProLeche, Bolivian statistics



Source: Faostat, Bolivian statistics



Source: ITC Trademap, Bolivian statistics

Dairy industry	Institutional
Cochabamba - PIL Andina (Cochabamba, Santa Cruz, La Paz) - Industrias Lácteas del Valle Alto (ILVA) | Cooperativa Integral de Servicios **Santa Cruz** - ClaraBella | ALSA Alimentos (also pigs, feed) - Productos Lacteos La Campiña - Industrias de Productos Lacteos La Purita - Okimilk - Delicruz SA **La Paz / El Alto** - Delizia - Flor de Leche - Sociedad de Alimentos Procesados Santiago (SOALPRO) - Industrias Lácteas de La Paz (ILPAZ) - Industria de Alimentos (INAL) | Panda **Other regions** - Productos Lácteos Capital - Chuquisaca - Productos Lacteos Tarija (PROLAC) – Tarija	ANDIL: Asociación Nacional de Industrias Lácteas (Andil) FEDEPLE: Federación Departamental de Productores de Leche – Santa Cruz FEPROLEC: Federación de Productores de Leche – Cochabamba APL: Asociación de Productores de Leche - Cochabamba APLI: Asociación de Productores de Leche Independientes ProLeche ASOCRALE: Asociación de Criadores de Razas Lecheras ACRHOBOL: Asociación de Criadores de Holstein *en* Bolivia LACTEOSBOL: Empresas Publicas Productivas Lacteos de Bolivia

Low-tech milk production

There are dairy farmers of all kinds of sizes, starting from as low as a single cow. Based on statistics of 2013, the productivity is assumed to be between 2.6 and 10.1 litres per cow per day on average. The best results can be found in Cochabamba (10.1 L/cow/day), Tarija (7.9 L/cow/day) and Santa Cruz (6.5 L/cow/day). According to Fedeple a more accurate estimation of the average production in Santa Cruz is around 10 litres per cow. More advanced dairy farms can reach a production of around 20 litres per cow per day.

Around 97% of the dairy farms in 2013 used manual milking. Mechanized milking is most common in Santa Cruz and Cochabamba, with just over 1,000 mechanized farms in each region in 2013.

Climate control systems are relatively new for milking farms in tropical Santa Cruz, with a probable penetration of less than a dozen professional farmers.

The dominant cow for milking is Holando (Holstein). The breed was traditionally not ideal for tropical climates, but once introduced, they adopted very well. Nowadays calves that are born and bred in Bolivia have become more or less resistant for local diseases and ticks. The import of bovine semen has continuously increased since 2008 to a value of 432 thousand euros in 2015, mostly from the United States.

Consumption

The milk consumption in Bolivia has doubled from 28.3 litres per capita per year in 2009 to 58.4 litres in 2014. The governmental programme ProLeche has supported this growth and aims to increase further to 150 litres per capita by the year 2025. Bolivian milk consumption is still far behind Brazil, Argentina and Uruguay, where the annual intake per capita reaches 160 to 240 litres.

PIL Andina: a leading dairy company in a controlled market

PIL Andina, privatised by the Peruvian company Gloria in 1996, employs over 2,500 workers and has a market share of 70-80% in dairy products and 90% in dried milk.

In 2015 the company collected 1,027 tonnes of milk in Santa Cruz, Cochabamba and La Paz. In Santa Cruz they recently extended their processing capacity from 0.5 to 1.5 million litres per day – an investment of approximately 45 million USD. To ensure product quality they use a bacteria analyser (Foss Bactoscan), but also help farmers with training and lowering the use of antibiotics.

Difficult times

The dairy industry in Bolivia experienced a big blow due to the decreased international milk price. Milk prices in Bolivia remained relatively high due to the production contracts ('*cupos*') with farmers. As a result PIL Andina milk powder exports to Peru were reduced and the pressure of contraband milk from Argentina and Brazil even complicated the new reality further.

Important business drivers:

- Maintain good quality in the influx of raw milk
- Improve competitiveness that facilitates export
- Better control of contraband
- Flexibility in the quota system

PIL processing plant Santa Cruz

Current challenges

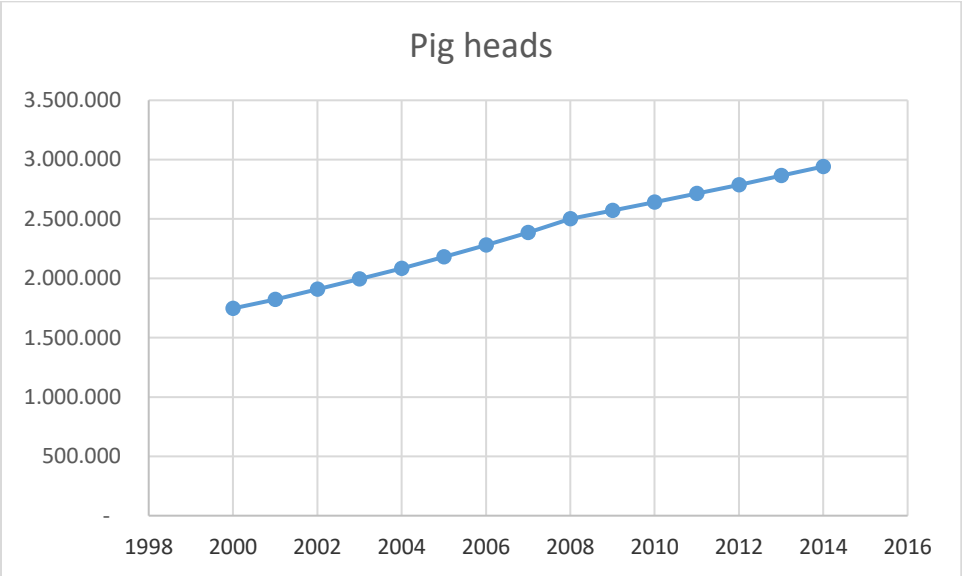
Recently the dairy sector is facing a number of problems, such as drought (2016), raw materials becoming more expensive and a lack of market due to overproduction and low international prices. As a result, many of the dairy farmers have seized their activities.

While the dairy industry is positioning itself in Bolivia, at farm level Bolivia counts with a variety of quality issues. Most common problems are concerning the acidity, high level of antibiotics and fraud (adding water to milk). Also the management of a proper cold chain needs improvement. The traditional collection often lacks the pre-cooling which is needed in a sub-tropical climate. Many small dairy farmers use milk jugs, but no further infrastructure.

Other Agrofood industries

#1 Pigs

The pig industry in Bolivia is considered to have room for further growth. Professional pig breeding has just taken off. In 10 years' time, the pig production increased with almost 35%. Sofía is one of the main pig breeders. According to the producer association Adepor the consumption of 3.5 kilos per capita has increased to 7,5 kilos in just 3 years, but there is potential for 15-20 kilos per capita. Large farmers have over 500 pigs and 80% of the pig industry is located in Santa Cruz.



Source: Faostat, Bolivian statistics

#2 Specialty food crops

There is an interest in moving away from (only) commodities. Agricultural professionals are looking for alternative crops, especially products with a higher value and export potential. Among these products you can find brazil nuts, quinoa, chia, bananas, coffee, palm hearts and ground nuts, but also niche grains such as amaranth, tarwi and teff.

In just a decade brazil nuts (tropical), quinoa (highland) and chia (Santa Cruz) have become some of the Bolivia's most valuable export products. But with annual exports of only 20 to 30 thousand tonnes, their volume is many times lower than that of soybean (184 thousand tonnes in 2014). Brazil nuts, ground nuts and quinoa find their origin in Bolivia.

High value products are destined for human consumption and mostly western markets, which means food safety requirements are strict and technological improvement is needed: processing and cleaning equipment (sorting, metal detectors, anti-microbiological), traceability systems, certification bodies, laboratories, proper storage, packing equipment, organic fertilizers and eco-friendly inputs.

		Export in million euros	2004	2009	2014
Traditional export	Non- traditional export	Soybean oil cake	209	234	498
		Soybean oil	101	112	221
		Quinoa	3	31	148
		Brazil nuts (shelled)	40	52	130
		Soy beans	19	33	68
		Raw hides, skins (no fur) and leather	18	12	49
		Ethyl alcohol (>= 80%)	10	29	48
		Sunflower oil (incl. safflower, cotton oil)	11	59	42
		Chia seeds (incl. other oilseeds)	0	1	30
		Soybean flour and meal	12	23	27
		Bananas (incl. plantains)	5	9	26
		Oil cake (non-soya)	4	20	21
		Dried leguminous vegetables (beans)	7	25	21
		Coffee	8	12	12
		Preserved palm hearts	4	6	12
		Sesame seed	8	12	10
		Cane sugar	24	49	8
		Groundnuts	1	2	6
		Lemon juice	0	0	2
		Maize	1	4	1
		Cocoa and cocoa preparations	1	1	1

Source: ITC Trademap

Plant breeding

#3 Processed fruit and vegetables

The production of fruit and vegetables are focused on the local market. There is little experience, nor the proper infrastructure to export (fresh) fruit and vegetables in large quantities. Traditional fruit orchards are not even suitable for modern machinery. But during the harvest season there is often an oversupply that cannot be absorbed by the local market. This results in serious quantities of produce that is left without being harvested or commercialised.

Production & export 2014 in tonnes		production	export
Fresh	Potatoes	1,069,011	7
	Bananas	163,749	111,103
	Onions	82,971	-
	Tomatoes	54,526	-
	Pineapples	50,993	2,559
	Peaches and nectarines	39,556	-
	Grapes	32,356	-
	Lemons and limes	26,934	2,139
	Watermelons	20,111	-
	Mangoes (incl. mangosteens, guavas)	11,310	-
	Papayas	8,337	-
	Avocados	5,896	-
	Apples	2,145	-
Preserved	Dried leguminous vegetables (pulses)	85,980	29,136
	Preserved palm hearts	n.a.	6,362
	Citrus juice	n.a.	1,691
	Peel of citrus	n.a.	778
	Preserved pineapples	n.a.	180
	Dried fruit	n.a.	23
	Wine	9,422	13

Sources: Faostat, ITC Trademap, Bolivian statistics

The export of fresh fruit is limited to banana, lemons and pineapples, which concerns mainly the supply of regional markets and only a fraction of the production. In order to increase trade and capitalise the production efficiently, there are two important developments needed:

1. Investment in processing, preserving and extending shelve life of fresh produce.
2. Improvement of market compliance, infrastructure and phytosanitary agreements for fresh trade.

This translates in a (latent) need for equipment and expertise in freezing (IQF), freeze-drying, pulp and juice processing, packaging, storing and cold chain logistics. In addition to the list above, other exportable and niche products include blueberries, açaï, camu camu, achachairu and maca.

Company	Product	Advantage	Challenge
Totaí	Citrus; fresh, essential oil, juice, dried peel	Longer production season than Argentina	Wind damaging lemons, financing, packaging
De la Sierra	IQF fruit (e.g. blueberries, mango, pineapple)	Use of surplus production	Market access
Bolita banana	Fresh bananas	Quality and access to Argentinian market	Logistics

Fruit processing line (IQF)

Frozen fruit

#4 Food industry / processing: bakery, drinks, confectionary

Traditionally Bolivia is a primary production country. The food industry in Bolivia is in its infancy. While international companies have left a mark in the processed food market through the distribution of their products or participation in Bolivian companies, there is now a growing competition of local brands. There is also more attention for local ingredients and flavours (e.g. papaya, achachairu, quinoa, coca).

According to Euromonitor 75% of the retail value for bakery products is dominated by artisanal brands. But the industrial offer of bread substitutes, snacks, packaged pastries, biscuits and breakfast cereals is expected to continue to grow. Also worth investigating is the drink industry, in specific niches such as sport and energy drinks, fruit juices and instant drinks. And a third segment for potential development is chocolate and confectionery.

Bakery	- **Sociedad Industrial y Comercial La Francesa** - **Sociedad de Alimentos Procesados Santiago (SOALPRO)** - Industrias Alimenticias Fagal Srl (Nestlé) - **Sociedad Industrial Molinera SA (SIMSA)**
Drinks	- Embotelladoras Bolivianas Unidas SA (EMBOL) (Coca Cola) - **Compañía de Alimentos Ltda – (Delizia)**
Confectionery	- La Serrana (Arcor) - Nestlé - **Chocolike (Madisa)**

Madisa: An example in chocolates

One of the famous and leading chocolate brands in Bolivia is Chocolike, which belongs to the diversified company Madisa.

For the chocolate production they use technology from Italy and Germany, but have also designed some of their own equipment. Just as in other Latin American countries, the quality of chocolate is kept at a low level (compound) because the local market does not require better. Nevertheless, the company counts with high production standards and has serious interest in the European and North American markets.

Madisa imports most of the cacao. For industrial users the cacao production in Bolivia is not sufficiently developed for a sustainable and competitive supply. But with at least 12 of the 17 thousand hectares being wild cacao, Bolivia has a unique product on offer. The combination of organised and motivated companies such as Madisa and the use of unique ingredients could be the basis for further development in Bolivian food processing, offering opportunities for both Bolivian and foreign businesses.

Important business drivers:
- Product development
- Access to markets

Chocolate production line

Product development

#5 Wood industry (Reforestation)

Improved control on forest clearing and strong foreign competition have slowed down the forestry industry since 2010. Wood export decreased with 50% between 2010 and 2016, and according to the Chamber of forestry in Bolivia (Cámara Forestal) 3,500 small wood companies have quit the business. At the same time there are new regulations to give an impulse to reforestation projects and motivate farmers to plant windbreakers (forest strips). These reforestation projects offer opportunities for tree nurseries.

Overview of the future challenges

The 8 major challenges in Bolivian agriculture

The challenges beneath are based on conversations with companies, branch organizations, and government officials. Most current and future challenges have a strong link with improving the business environment and competitiveness in Bolivia.

#1 - Food safety practices and control

Low attention and control in food safety and animal health are obstacles for Bolivia to become an export nation. Underlying issues include:

- High level of informality.
- Low quality standards in local market.
- Small producers lack knowledge and financial resources.
- Public sanitary service (Senasag) is poor and underfunded.
- Deficient control on silo storage (vermin, mould) sometimes resulting in 10-15% losses or more.

#2 - Productivity

Bolivia is not able to compete with large productive powers such as Brazil and Argentina. Yields are low and performance is poor.

- Seed breeding and biotechnological knowledge is underdeveloped.
- Less access to genetically improved seeds.
- Lack of investigation.
- Small scale farming.
- Poor agricultural practices (e.g. lack of windbreakers, crop rotation and cover crops).

#3 - Sustainable agriculture

In despite of increasing attention to sustainable and socially responsible farming, the impact of soil erosion, (illegal) deforestation and pollution remain a concerning issue.

- Insufficient control on deforestation.
- Insufficient control on pollution (e.g. water)
- High use of agrochemicals.
- Little rotation (monocrops).
- Poor agricultural practices (e.g. tillage).

#4 - Climate change & water

Climatic circumstances are changing and strong droughts (such as in 2016) alternates with inundations. Water availability has become one of the principle subjects in climate change, especially in the Bolivian valleys.

- Little use of irrigation.
- Poor water management.

#5 - Institutional development

Public authorities and executive bodies often lack resources and knowledge to sufficiently support the agricultural and private sector.

- Management positions of public organisations are politically appointed.
- Many executive and public knowledge institutes lack funding and qualified personnel.
- Contraband import is competing with local companies.
- High level of corruption.

#6 - Public intervention in private sector

Export quota and state owned businesses result in a complex commercial environment, corruption and low competitiveness.

- State owned companies (Emapa) compete with low prices.
- Export quota limits reliability and potential of exporters.

#7 - Access to markets

Many farmers depend on intermediaries and Bolivia's participation on international markets is limited. There are many reasons:

- Most farmers do not have silos for storage and thus no direct access to the market.
- There is a lack of market knowledge and transparency (internal and external).
- The national export promotion effort is low.
- Bolivia lacks export standards and bilateral phytosanitary agreements.
- Logistical challenge: no sea access and large distances (Santa Cruz to Arica/Chile is over 1,100 km with high mountain crossing, Santa Cruz to Brazilian border is over 600 km)

#8 – Legal security of land ownership

The rules of land ownership are not clear and in the current governmental policy (INRA) farmers are not secured of their land ownership and risk losing their land to the state if not properly used.

- Food security and small farmers have a preference over export and large scale commercial farming.
- Illegal squatters/farmers cause long-lasting legal processes for land owners.

Private organisations

The level of private organisation is high, especially in Santa Cruz. Sector and branch organisations are often better organised, more informed, more involved with producers than public authorities. They are an excellent starting point to get market information or get in contact with companies.

Organization	Description
AB CREA	Bolivian association of groups
CADEX	Chamber of exporters of Santa Cruz
CAINCO	Chamber of industries, commerce, services and tourism of Santa Cruz
CAO	Agricultural chamber of the east
CETABOL	Technological centre for agriculture in Bolivia
FEPSC	Departmental federation of private entrepreneurs of Santa Cruz
FUNDACRUZ	Foundation for the agricultural development of Santa Cruz
IBCE	Bolivian Institute of international commerce
IBNORCA	Bolivian Institute of Standardisation and Quality
PROINPA	Foundation for agricultural investigation and technological innovation
PROLECHE	Fund to support the dairy productive complex
Sector associations	**Description**
AB-Brangus	Bolivian association of Brangus
ACRHOBOL	Association of Holstein breeders Bolivia (Cochabamba)
ADA Cochabamba	Association of poultry farmers of Cochabamba
ADA Santa Cruz	Association of poultry farmers of Santa Cruz
ADEPOR	Association of pig farmers in Santa Cruz
ANA	National association of poultry farmers
ANAPO	Association of producers of oil crops and wheat
ANAPOR	National association of pig farmers in Bolivia
ANDIL	National association of dairy industries
APL	Asociación de Productores de Leche (Cochabamba)
APLI	Asociación de Productores de Leche Independientes (Cochabamba)
APRISA	National association of suppliers of agricultural inputs, goods and services
ASOCAÑA	Association of sugar cane producers
ASOCEBU	Association of zebu cattle breeders
ASOCRALE	Association of dairy cow breeders
ASOHFRUT	Departmental federation of horticulturist and fruit growers
AVIPAR	Association of poultry farmers Avipar
CONGABOL	Confederation of cattle breeders in Bolivia
F.C.S.C.	Federation of sugar can producers Santa Cruz
FEDEPA	Federation of cotton producers
FEDELPAZ	Departmental federation of milk producers of (La Paz)
FEDEPLE	Departmental Federation of Milk Producers (Santa Cruz)
FEGABENI	Federation of cattle breeders in Beni
FEGASACRUZ	Federation of cattle farmers Santa Cruz
FENCA	National federation of rice cooperatives
FEPROLEC	Federation of milk producers (Cochabamba)
PROMASOR	Association of producers of maize, sorghum, beans and alternative crops
SOCA	Association of sugar cane producers SOCA

Highlighted:

CAO

The Agricultural Chamber of the East (CAO) is the umbrella organisation of 18 farmer, livestock and agri-business associations, with over 60,000 members in Santa Cruz. It is also one of the initiators of the annual international trade fair EXPOCRUZ. The CAO is an important strategic partner for trade and investing relations between the Netherlands and Santa Cruz.

Expocruz trade fair

Expocruz Holland pavilion

ANAPO

Anapo is one of the main producer organisations, including soya as a crucial commodity for the local economy. They supply seeds and provide technical and commercial assistance, but are also a spokesperson towards policy makers. Some of their objectives are:

- Triple the agricultural production;
- Improve access to the same transgenic seeds as Argentina and Brazil;
- Strive for free export of commodities;
- Improve logistics (e.g. Puerto Busch);
- Increase legal security of land ownership.

Grupo CREA

CREA, an Argentinian concept in origin, facilitates and formalizes the exchange of knowledge. For example knowledge about insects, seed varieties, the use of agrochemicals or fertilizer, drones or automatic feed silos. CREA forms groups of 10-12 agricultural companies that meet once per month. A meeting is hosted at one of the companies where they will present an actual problem or challenge, after which the rest tries to find a solution divided in two groups.

CREA publishes 4 magazines per year and has 3 main events (one per year):

- Congreso internacional ('international congres'), an educational and philosophic get-together.
- Tranqueras abiertas ('open gates'), technical conversations.
- Crea familia ('CREA Family'), for members and their families.

CREA statistics			
Members	**Total represented production**	**Groups**	**Sectors**
180 (medium and large agribusinesses)	250-350,000 ha cultivated land 300,000 heads of livestock.	16 active groups 4 groups in formation 3 groups in restructuring	60% livestock 20% agriculture 15% mixed 5% sugar cane dairy & eggs (in formation)

Public organizations

Organization	Description
MDRyT	Ministry of Rural Development and Land
MMAyA	Ministry of Environment and Water
MDPyEP	Ministry of Productive Development and Plural Economy
Gobernación Autónomo Departamental de Santa Cruz	Autonomous departmental government of Santa Cruz
CIAT	Centre of investigation for tropical agriculture
INIAF	National Institute of agricultural and forestry innovation
SENASAG	National Service of Agricultural Health and Food Safety
INRA	National Institute of Agricultural Reform
ABT	Authority of inspection and social control of forests and land
INE	National institute of statistics of Bolivia
UAGRM	Autonomous university Gabriel René Moreno in Santa Cruz
CNI	National centre of industries

Public policies

Socially engaged or contra-productive?

When speaking to entrepreneurs, branch organisations and regional governments, it becomes clear that often the good intentions of the national government do not work in practice.

The patriotic agenda

The 'patriotic agenda 2025' of describes 13 pillars of a dignified and sovereign Bolivia:

1. Eradication of extreme poverty.
2. Socialise and universalise basic services with sovereignty for well-being ('Vivir Bien').
3. Health, education and sport for the formation of an integral human being.
4. Scientific and technological sovereignty with its own identity.
5. Financial community sovereignty without servility to financial capitalism.
6. Productive sovereignty with diversification and integral development without the dictatorship of the capitalist market.
7. Sovereignty over our natural resources with nationalisation, industrialisation and commercialization in harmony and balance with mother earth.
8. Food sovereignty through the construction of food knowledge to live well ('Vivir Bien').
9. Environmental sovereignty with integral development, respecting the rights of mother earth.
10. Complementary integration of peoples with sovereignty.
11. Sovereignty and transparency in public management under the principles of not stealing, not lying and not being lazy.
12. Enjoyment and full happiness of our feasts, our music, our rivers, our forest, our mountains, our snow, our clean air, and our dreams.
13. Sovereign reunion with our joy, happiness, prosperity and our sea.

Specific legislation & policies

Legislation	
Constitución Política del Estado (2009)	Political Constitution of the State
Ley Nº 1715 (1996), Ley Nº 3545 (modification 2006)	National Service of Agricultural Reforms
Ley Nº 337 (2013)	Programme for food production and restitution of forests
Ley Nº 755 (2015)	Law to establish policy for waste management
Ley Nº 516 (2014)	Law to promote investments

Land must have a socio-economic function

Land must have a social or socio-economic function. The programme for food production and restitution of forests ensures that (illegally deforested) land is destined for useful purposed defined by the national government, such as food security and reforestation. Agricultural businesses that do not fit the Bolivian principles, risk losing their land to agricultural reforms. While the programme aims to reduce deforestation, it is also argued that it immobilises large areas of productive land.

Preference for national investments and products

In the Constitution of 2009 Bolivian investments are prioritized over foreign investments. The constitution strives for a cooperative economy that promotes Bolivian products and incorporates the indigenous people. In 2014 Bolivia adopted an investment law, recognising legal security for both national and foreign investment, but also emphasizing the conditions of the constitution. The nature of political opinions or decisions on specific cases can be unpredictable.

Centralised power

The process of transferring power to the regional departments has been slow. Referendums in 2008 for more autonomy in Santa Cruz, Tarija, Beni and Pando have been declared invalid. However, in 2010, following the new constitution, departments have been granted executive and legislative autonomy (not judicial), and their governors are now elected by popular vote. The public budget is till for 80% managed by the central administration.

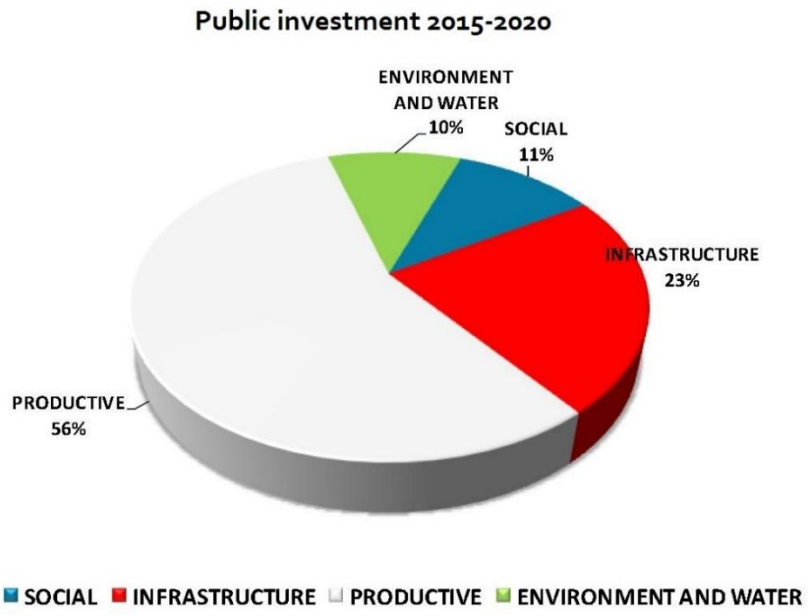
Nationalization of the hydrocarbon industry

Nationalisation of the hydrocarbon industry at the start of Evo Morales presidency in 2006 together with high commodity prices, boosted the international reserves of Bolivia. After the peak in November 2014, these reserves have dropped considerably and are expected to further decrease. The income from direct tax on hydrocarbons and royalties in gas and mining is decreasing. Meanwhile regional governments and municipalities have demanded more autonomy and tax revenue. Bolivia will needs to find other ways of tax income, which is difficult in a country with 65-70% informality.

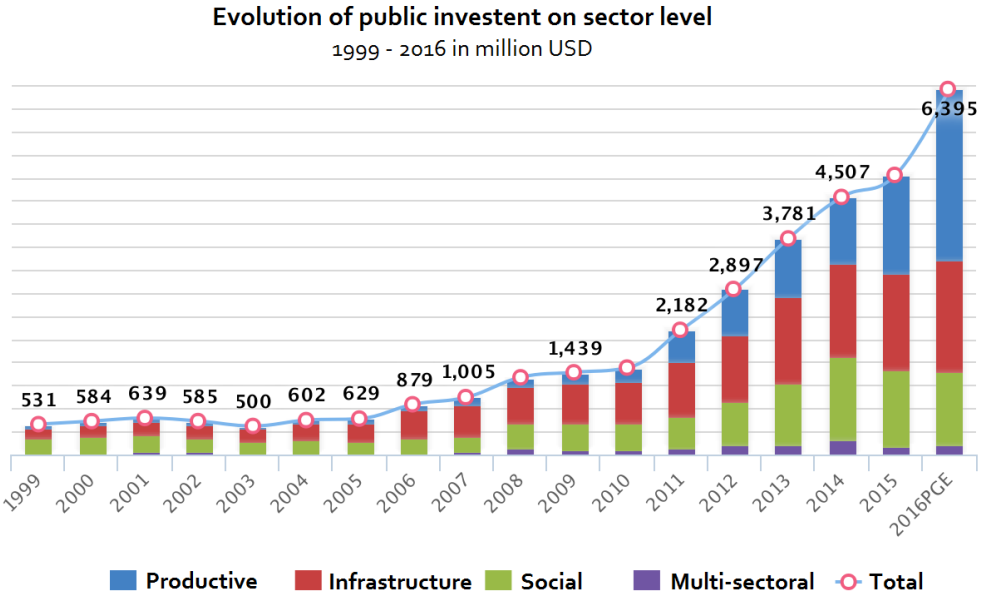
Increasing wages

In attempt to provide more security for workers, the government has increased minimum wages and raised the contribution of companies for healthcare and pensions. Labour costs have tripled in less than a decade and has become a reason for many businesses to lay off workers.

In the period 2015-2020 productive expenditure will account to 56%, supporting the industrialization and generation of added value. The agro industry will be among the sectors.



Source: Economic and Social Development Plan 2015-2020



Source: Ministry of Development Planning

Public support programmes & initiatives

Most projects and support programmes are managed by public enterprises.

Entities of: Ministry of Productive Development and Plural Economy	
Insumos Bolivia	Provides support in the supply of **inputs, goods and equipment** to contribute to the productive development and food security.
Emapa	Enterprise for support of food production **(grains, maize, soybean)**
Easba	**Sugar cane** company: Empresa Azucarera San Buenaventura (La Paz)
Quipus	Bolivian innovation: Produce, assemble and market **technological equipment**
Yacana	Production of **camelids and fibers**
SEDEM	Development service of public production companies: - Lacteosbol – **dairy products** - EBA – **brazil nuts & derivate** - Promiel – **honey** - EEPAF – **fertilizers** - EEPS – **seeds**
ProBolivia	Provides business development services for SME, productive associations, cooperatives and other producer organizations. *For example **ProLeche**:* - *Contribute to food security, facilitating the access to dairy products.* - *Promote the consumption of dairy products to increase nutrition of people.* - *Foster the development of the Dairy Productive Complex.* - *Fair price for milk producers and the consumer.* Other food projects
Promueve Bolivia	Facilitates and promotes **export and tourism** of Bolivia.

Emapa

The public enterprise Emapa is directly involved in the trade in agricultural commodities. Their goal is to help stabilise the market and provide reasonable prices for small farmers and livestock breeders. In practice this means that their purchase prices are higher than their sales prices. Commercially Emapa is not a sustainable business. In the eyes of professional agrifood entrepreneurs Emapa is very inefficient and actually a distortion of the market, competing with other suppliers. Another common reaction is that Emapa does not really know to whom they sell and maintains a quota system that easily corrupts.

Emapa has a 10% share in the commodity trade and has public funds to spend (approx. 70 million USD in 2016), which makes it an interesting buyer of processing and storage equipment.

Projects of: Ministry of Environment and Water	
MiRiego	Develops irrigation projects (partly financed by CAF, BID). The National Plan for the Irrigation Development aims to reach 450 thousand irrigated hectares until 2025. - Pronarec (2009-15) - Pronarec II (38 of 43 million USD committed) - MiRiego CAF (13 of 60 million USD committed) - Programme Plan Vida OPEC (2 of 4 million USD committed) - Project: monitoring of glaciers - Project: strategy for biodiversity

MiRiego

MiRiego wil enter a next phase of planning investments in irrigation and river basin management with a new BID fund of 185 million USD. The Ministry of Environment and Water is looking for knowledge and is interested in foreign cooperation. Some of the bottlenecks are:

Limitation in expansion: Expansion of irrigated land is limited due to 1. lack of water, 2. lack of suitable areas (not exposed to flood risk or other restriction) and 3. social conflicts.

Production planning in irrigated areas: Irrigation programmes have not been able to implement production planning in their projects due to poor collaboration with the authorities of agricultural development: Farmers continue producing the same crops, but on a larger scale, resulting in overproduction.

Institutional weakness: A large number of projects are returned due to their poor design or bad concept. There is institutional weakness in identifying and preparing investments and universities lack technological and curricular development.

Projects of: Ministry of Rural Development and Land (from 2016 public investment budget)	
Bs 125 million (28%)	- Implementation programme of potato production and early/winter seeding
Bs 70 million (15%)	- Support to inclusive (agricultural) entrepreneurship
Bs 50 million (11%)	- Implementation sustainable development programme for cattle breeding
Bs 50 million (11%)	- Implementation strengthening cacao production
Bs 22 million (5%)	- Improve national market access for rural producers
Bs 20 million (4%)	- Implementation productive and sustainable agricultural support programme for the amazon
Bs 20 million (4%)	- Construct and maintain neighbouring roads of Chapare and Yungas
Bs 20 million (4%)	- Management for adaptation of small-scale agriculture in the valleys of Chuquisaca, Potosí and Tarija
Bs 15 million (3%)	- Implementation strengthening production programme of tomato in Santa Cruz, Cochabamba, Chuquisaca, Tarija and La Paz
Bs 14 million (3%)	- Support for sustainable and inclusive economic growth

Projects of: National Institute of agricultural and forest innovation (INIA - from 2016 public investment budget)	
Bs 20.9 million (87%)	- Implementation of agricultural innovation and services
Bs 2.8 million (12%)	- Development of inclusive and sustainable economic growth
Bs 0.3 million (1%)	- Development of technologies to improve the production of cacao and rice in La Paz, Santa Cruz and Beni

Projects of: Development Service for Public Productive Enterprises (SEDEM - from 2016 public investment budget)	
Bs 0.2 million	- Implementation of processing plant for apiculture, Chuquisaca
Bs 29 million	- Implementation of processing plant for stevia, Cochabamba
Bs 30 million	- Implementation and development of a apiculture productive complex, Yungas

Projects of: Emapa (from 2016 public investment budget)	
Bs 67 million	- Implementation of fishery complex in tropical Cochabamba
Bs 57 million	- Construction of storage centre for food/feed ingredients, Santa Cruz
Bs 57 million	- Construction of storage centre for food/feed ingredients, Oruro
Bs 53 million	- Construction of storage centre for food/feed ingredients, Beni
Bs 43 million	- Construction of 2nd phase grain collection and transformation plant, Santa Cruz
Bs 41 million	- Construction of grain storage and transformation centre, Tarija

See also: Emapa Investments

Projects of: Empresa Azucarera San Buenaventura (Easba - from 2016 public investment budget)	
Bs 80 million	- Implementation of sugar cane crop San Buenaventura, La Paz
Bs 50 million	- Implementation of industrial plant San Buenaventura, La Paz
Bs 0.4 million	- Improvement of administrative and commercial infrastructure of Easba, La Paz

Projects of: Empresa Publica YACANA (from 2016 public investment budget)	
Bs 104 million	- Implementation/construction of transformation company of camelid fibre

Projects of: Lacteos de Bolivia (Lacteosbol - from 2016 public investment budget)	
Bs 18 million	- Implementation of freeze-drying plant for fruit, La Paz
Bs 16 million	- Implementation of freeze-drying plant for tropical fruit, Cochabamba

Examples of other large investment projects

Project	Budget / costs	Status	Description
Puerto Busch	400 million USD	Ambition	Improve maritime transport and access to sea.
YPFB Urea plant	876 million USD	In progress	Production of urea & ammonia
Rositas	1,000 million USD	Contract signed	Hydroelectric plant, flood prevention and irrigation (see below)

Public projects and investments in Santa Cruz

In Santa Cruz there are numerous initiatives of environmental projects and farmer support. Below some of the current projects are described below.

Harvesting water

The water supply in Santa Cruz has been privatized. The water problems are less severe in Santa Cruz than nation-wide thanks to the 2,000 wells in the region. There is now a 97-98% coverage compared to 50% in 2006. Nevertheless, 90% of the budget is nationally managed.

Rositas project: Irrigation and hydroelectricity

A consortium of three Chinese companies and the national electricity company (ENDE) signed a contract to build a hydroelectric plant of 1 billion USD. The project will be developed in the departments of Santa Cruz and Chuquisaca and will not only generate over 400MW, but will also prevent floods and provide irrigation to 165,000 hectares in the Chaco region. The irrigated land will have potential for 3 harvests per year of mainly fruit and vegetables.

SIC Information system

The government of Santa Cruz has developed an Information and Communication System (SIC Santa Cruz) that provides daily market prices, transfer of agricultural technical knowledge and meteorological information to small and medium producers of the department's 15 provinces.

Centre of Investigation in Tropical Agriculture (CIAT)

The CIAT is an entity within the Santa Cruz government which develops investigation projects and increases knowledge transfer. Among the projects published on their website are these projects:

- Investigation in sowing seed: Rice, wheat, soybean, maize (new varieties)
- Investigation in cattle farming (criollo breed)
- Project in soil management
- New laboratory for soil, plant and water

Cooperation JICA: Development of food chains

According to Secretary of Productive Development of Santa Cruz (*Secretaria de Desarrollo Productivo de Santa Cruz*) they will receive support from the Japan International Cooperation Agency (JICA) in a new development project '*Agregar*' ('to add').

The JICA cooperation contemplates assistance in crop management, cultivation and commercialization/marketing of fruit and vegetables and has special attention for small and medium producers. It aims to develop a food chains in municipalities in the valleys of Santa Cruz that will reach gastronomic professionals, catering and supermarkets. Packaging and presentation is part of the project and will make producers less dependent of intermediaries. Officials say Santa Cruz withholds 60-70% of the vegetable and tuber production and around 40% of the fruit production. The pilot includes 6 crops: potato, tomato, peach, apple, honey and organic vegetables. The ministry already showed interest in implementing the project on national level.

JICA and Bolivia

JICA has a long history in Bolivia. Cetabol, a technological agricultural centre in Bolivia, was founded with the support of JICA and later transferred to local Japanese cooperatives CAICO ltda. and CAISY ltda.

World Bank projects

The World Bank dedicated 285 million USD to projects in Bolivia in 2016. An overview of these projects can be found on the World Bank website.

Tenders

Tenders in Bolivia can be monitored and followed on the web portal of InfoSICOES.

National tenders of the government require local representation and registration with the Bolivia's national chamber of commerce, the internal revenue service, the vice ministry of Industry and Commerce, FundaEmpresa and the local municipality.

Information and links

Subject	Link
Phytosanitary issues	Senasag Common requirements for agrifood and agricultural products: - Registro Sanitario de Empresas del Rubro Alimenticio (Senasag) - Permiso de Inocuidad Alimentaria de Importación (Senasag) - Permiso Fitosanitario y Zoosanitario de Importación (Senasag) - Certificado de Salud Veterinario para Productos de Origen Animal See also: NVWA (Dutch)
Customs	Aduana Nacional
Tariffs and export requirements	Market Access Database (EU)
Import in Bolivia	Import guide Bolivia (in Spanish)
Export to Bolivia	Export.gov (in English)
Market information, doing business and legislation	RVO (in Dutch)
Tenders	web portal of InfoSICOES
Taxation	Doingbusiness.org – paying taxes
Investment protection	Doingbusiness.org – protecting minority investors
Dutch projects in Bolivia	RVO Aiddata
Bilateral and international cooperation (2013)	La Cooperación International en Bolivia 2013 - Ministry of Development Planning | Vice-ministry of public investment and external finance

Overview of trade agreements

CAN	Comunidad Andina	Bolivia, Colombia, Ecuador, Peru
ALBA	Alianza Bolivariana para los Pueblos de Nuestra América	Bolivia, Venezuela, Ecuador, Cuba, Nicaragua, a.o.
MERCOSUR	Mercado Común del Sur	Argentina, Brazil, Paraguay, Uruguay, Bolivia (pending), Venezuela (suspended). Ass. members: Chile, Colombia, Ecuador, Peru
ALADI	Asociación Latinoamericana de Integración	Bolivia, Arg, Braz, Cl, Col, Cuba, Ec, Mex, Py, Pan, Pe, Uy, Ven
TCP	Tratado de Comercio de los Pueblos	Bolivia, Venezuela, Cuba
FTA	(Free) Trade Agreements	MERCOSUR, Chile, Mexico, Panama, India, China, Russia, EU
GSP	Generalized System of Preferences	European Union, Japan, Switzerland, Russia, Canada, Australia, New Zealand, Norway, United States
SELA	Latin American and Caribbean Economic System	members
UNASUR	Union of South American Nations	members

Challenges and needs for Dutch companies in Bolivia

Facing challenges with a perspective on business development

For most Dutch agri-food companies Bolivia is not on the top of their priority list. The fact that Bolivia is a small Latin American economy and a country in development, make suppliers and investors easily shift their focus on Bolivia's stronger neighbours, such as Brazil or Argentina. Therefore they often have a passive or reactive attitude towards Bolivia.

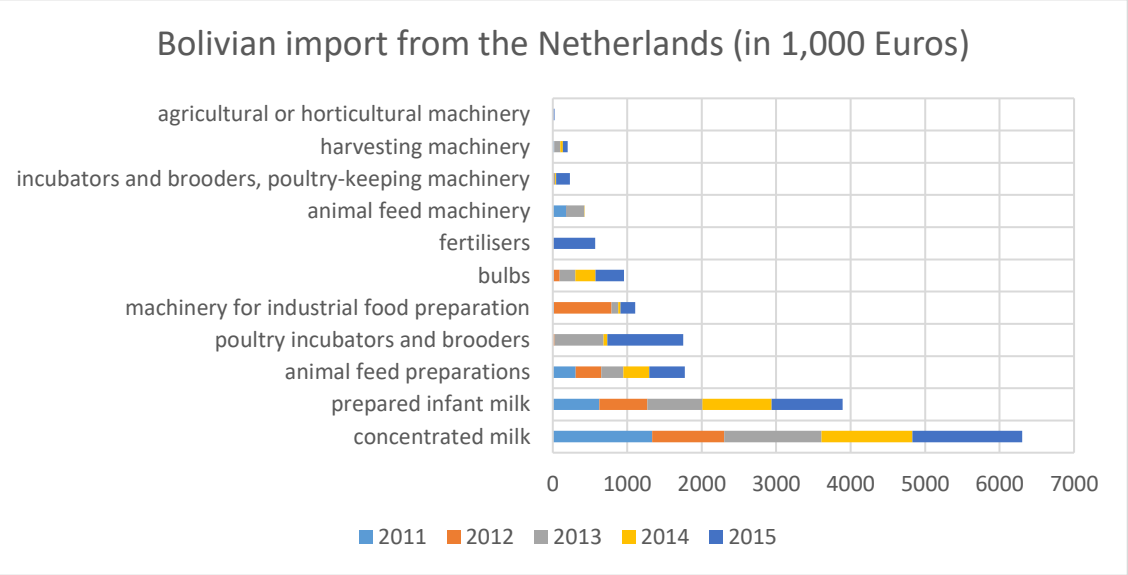
It is safe to assume that companies with an active approach choose Bolivia for a reason. They either supply a very specific niche products, or they recognise and understand the possibilities of an agricultural and emerging agri-food industry that is full of ambition. The business community has a very open attitude and welcomes Dutch knowledge and technology. Bolivia is not a country to only 'do' business, but to 'develop' it.

Keywords for Dutch entrepreneurs in Bolivia:
business developer, socially engaged, pioneer, knowledgeable, passionate about Bolivia, looking for alternative or specific markets, likes sharing experiences.

Constraints in Dutch competitiveness

Most agricultural equipment used in Bolivia concerns common technologies for commodities and livestock. These common technologies are imported from countries such as Brazil, Argentina, China or the United States. Fertilisers are mostly purchased in Peru and Chile. Price, product suitability and business relation are relevant for a purchase. The Netherlands seems far away and there is undeniably a technological gap.

Bolivian agribusinesses are looking for knowledge and simple but effective solutions, potentially including refurbished equipment. There is, however, a growing demand for more advanced solutions, which can be found within biotechnology or specific segments of the poultry or dairy industries. See trade statistics below for an overview of imported products in the last five years.



Constraints in the business climate

Bolivia's business climate is strongly determined by public policy.

Investment: The investment climate is expected to improve as Morales recognised the importance of foreign investors. However, decision making at government level is still highly unpredictable and businesses that do not comply to the socio-economic vision remain at risk.

Export quota: The export quota hamper growth in international trade, which also slows the demand for advanced knowledge and technology. Economic progress in Bolivia is more likely to happen when they are able to integrate well in the global trade of added value and high value agricultural products.

Exchange rates: The Bolivian currency has been practically fixed to the US dollar since 2011. Exchange rates may have been beneficial for exports to Bolivia, but not so much for Bolivian exporters. It has also resulted in heavy competition of cheap import products. The government clearly choose consumer purchasing power over export competitiveness, which could be problematic for future growth of the private sector.

Access to finance: Another challenge is the access to finance, which especially seems to affect medium sized businesses. Interest rates are high and expanding business activities is difficult and expensive. Small and micro-sized businesses can count easier on government support.

Challenges and needs for Dutch businesses

Bolivia's economy has predominantly a regional focus, both is sales and purchasing. Relatively few Bolivian companies actively look for suppliers or clients in Europe. The other way around, there are not a great number of Dutch companies that have extensive knowledge or experience in Bolivia. The steps below seem all too obvious, but are important.

INFORMATION	Dutch businesses need to get better informed about opportunities, the size of a specific market and the potential demand for specific product or expertise. Organisations and public entities can increase interest in Bolivia through promotional and trade activities.
PRESENTATION	Companies that want to do business in Bolivia need to be able to present themselves in Bolivia as Bolivian companies are not used to travel in Europe. Some support from the embassy or trade specialists can help with establishing the first contacts. Trade fair participation is best combined with external visits, matchmaking and company presentations.
FOLLOW UP	A follow up is a responsibility of the company concerned.
BACK UP	In a country such as Bolivia, companies look for ways to minimize their risks. A close cooperation between the Dutch government, financial organisations and trade specialists should provide sufficient legal, financial and commercial security.

Dutch companies

Companies with suitable technologies for Bolivia

Below Dutch companies are listed that:

- Are / have been active in Bolivia on trade fairs, in projects, with import/export or by local presence.
- Are active via representations in Bolivia or nearby countries;
- Have products or services that are potentially interesting for Bolivian agriculture or agri-food sector.

Company	Activities
Agripoort	Milking machines
AgroMax	Online poultry and livestock equipment
Alpha Trading Group	Exporter agricultural products
Amatrex Holland	Agricultural machinery, new and used
C. van 't Riet Zuiveltechnologie	Dairy technology
Control Union	Inspection and laboratory service
CRV Holding B.V.	Herd management and improvement
DFI	Import ingredients
DO-IT	Import organic ingredients
Dorset Group	Organic waste processing & animal housing
Freshlight Agri	Air purifying lighting
Gebr. de Jong Bulbs	Flowerbulbs
HatchTech	Poultry incubation technology
Hendrix Genetics	Animal breeding & genetics
Imeko Dairy Products	dairy products
INPA Parket	Parquet floors
Jansen Poultry Equipment	Poultry equipment, dealers in br, arg, col
Kramer	Agricultural machinery, new and used
Lely International	Cattle and dairy farm technology
LMB Roelofs	Agricultural mechanisation
Machinehandel Lekkerkerker	Dairy and food technology
Marel | MPS	Meat processing equipment
Marel | Stork Poultry	Poultry processing
Meelunie	Ingredients
Meyn	Poultry processing
MPS AQUA	Industrial water treatment
Nutricia (Danone)	Infant formulas
Orffa B.V.	Feed solutions
Ottevanger	Milling engineers
Paques	Water treatment
Pas Reform	Hatchery solutions
Rhumveld	Import ingredients
Royal Dekker (Dekma Bolivia)	Wood
Royal Haskoning DHV	Engineering (e.g. rural development, water)
Seatrade	Logistics
Tecopor	Pig housing equipment
Texel4Trading	Green energy
TopKip	Poultry processing technology
Tradin	Import organic ingredients
Triodos Bank	Finance
Unilever	Consumer (food) products
Van Aarsen	Feed production systems
Vencomatic Group	Poultry solutions
Wageningen University	Research projects
Witteveen & Bos	Engineering (e.g. environment, water)

Source: http://dutchtradepartners.com , Expocruz, and other sources

See also: Dutch Dairy Centre, Dutch Poultry Centre and NAFTC (Agri-food)

Bolivia Public Funding

In 2016 23% of Bolivians public funding was from external sources, of which 46.7 million USD in donations and 1,400 million USD in external credit (e.g. CAF, China, IDB, Fonplata). Around 5.5% of the total budget was planned for the agricultural sector.

Private financing Bolivia

In Bolivia many agricultural businesses depend on external financers – their credit is often provided by the commercial houses ('*casas comerciales*') that provide the agricultural inputs, or by the large industrial enterprises such as ADM, Fino, Dreyfus, Cargill.

Due to the extensive drought, farmer debts with 'casas comerciales' reached an estimated half a billion USD in 2016.

Financer	**Obstacles**
Casas comerciales	Debts increase insecurity of next production season
Commodity traders	Increases dependency / little negotiation power
Commercial banks, for example: BancoSol* Banco de Desarrollo Productivo (BDP) Banco Nacional de Bolivia (BNB) Banco Mercantil Santa Cruz (BMSC) Banco Ganadero Banco BISA	High interest rates
State support / microcredits	Only for the smallest farmers

* Triodos and FMO are shareholders of BancoSol, the largest microfinance bank in Bolivia.

Agricutural entities soliciting credit (in 3 years)						
	Soliciting for credit			**Reason for rejection**		
	Total number	Successful	Not successful	Lack of guarantee	Lack of documentation	Pending debt
Bolivia	95,384	73,413	21,971	5,078	3,619	381
Santa Cruz	24,023	19,962	4,061	1,054	613	87

Source: Censo Agropecuario 2013

Some of the permanent challenges for Bolivian agribusinesses:

1. Financing does not always fit a specific production cycle;
2. Farmers do not have official ownership over their land / no collateral;
3. Interest rates are relatively high.

Development aid

Developing finance	Development aid
- Triodos - Rabobank Foundation & Rabo Rural Fund - Oiko Credits - Root Capital - Impact Finance Fund - Smallholder Finance Facility (initiative of FMO and IDH) - Bancosol (microfinance)	- Hivos - ICCO - Cordaid - Solidaridad - SNV - PUM

Dutch finance programmes*

DGGF	Open	Dutch Good Growth Fund - for SME that do business with developing countries and emerging markets. Investment support: loans, warrantees, participations with repayment obligation. Export support: export credit insurance and export financing.
FDW	Open	Sustainable Water Fund - for public-private cooperation for water safety and security.
DRIVE	Open	Financial instrument for infrastructural projects with a focus on: Food security, water, reproductive health, climate
FDOV	Temporarily closed	Facility for Sustainable Entrepreneurship and Food Security - for public-private cooperation for food security and private sector development
WWSD	Temporarily closed	'*Waterveiligheid en Waterzekerheid Stedelijke Delta's*' - Subsidy for testing, demonstrating or researching feasibility of new water technologies.
DHI	Temporarily closed	Subsidy programme for demonstration projects, feasibility studies and investment preparation studies
PSI	Closed	Private Sector Investment programme**

*For active funding projects in Bolivia, see: Aiddata.rvo.nl
**See Annex IV: PSI projects: Previous PSI projects can be a good indication where entrepreneurs have seen opportunities in Bolivia.

Private financing for Dutch companies

Atradius	export credit insurance
Rabobank	trade services, import/export financing, investment
FMO	Investment finance (FMO has invested 2 billion euros in projects throughout Latin America.)

Obstacles for Dutch companies:

1. Commercial banks have little attention for Bolivia;
2. Atradius considers Bolivia to be a medium to high risk country for international business;
3. Limited or unpredictable protection for foreign investors.
4. FMO has a threshold of minimum 3 million euros and only finances medium-large companies (250 workers)

Leading companies in Bolivia

Most important companies with financial power for innovation

Large companies are often strongly linked to investment groups (foreign or national), families or even a financial institution. Unlike small and medium sized companies, these companies have relatively easy access to capital.

Companies in Bolivia with leading reputations		
AGRO INDUSTRY	**FOOD INDUSTRY**	**HOLDING**
1. Ingenio Azucarero Guabirá 2. Unagro 3. Gravetal 4. Aguaí Ingenio Sucroalcoholero 5. Nutrioil - IOL - Ciagro - Granos - Caisy	1. Pil Andina 2. Avícola Sofía 3. Fino Industrias de Aceite 4. Nestlé Bolivia 5. IMBA 6. Arcor Bolivia 7. Grupo Venado 8. Fridosa 9. Pollos Copacabana 10. ADM SAO 11. Emapa 12. Stege 13. Molino Andino - Pollos Chriss - Bolivian Foods - Cooperación Industrial Dillmann	1. Grupo Industrial Roda 2. Grupo Fortaleza - Landicorp - Madisa

Source: 2016 Corporate reputation monitor Merco, supplemented with other data

Opportunities for Dutch-Bolivian cooperation

A resume of potential opportunities in different industries

Based on the findings of this fact finding report, the following opportunities and interesting segments have been identified:

	Dutch strength	Important	urgent	Awareness	Desired	Gov. enforcement needed	Finance needed
knowledge development							
- NGOs *training to farmers*: soil management, sustainable production, IPM. Look for cooperation with CAO, APIA, Anapo, or grupo CREA.		X		X	X		X
- Organise *student exchange programmes* with Dutch universities to strengthen curriculum in agricultural technology – For example with Wageningen University	X				X		X
- Increase knowledge/experience in *organic cultivation*. This is important for high value crops (chia, quinoa) and will benefit importers of organic ingredients.		X		X	X		X
Sustainable agriculture & Environment							
- *Water treatment technology* for sugar cane industry, abattoirs and other polluting agro industries. Commitment and enforcement from government is necessary.	X	X	X			X	X
- *Irrigation technology* for Andean valleys and highlands to improve the production of rice, fruit, vegetables and other horticultural crops. There has been much attention to the problem by national projects (MiRiego) and international cooperation (e.g. with Germany), but the problem is far from being solved: 9% of the agricultural surface is irrigated, mostly flood irrigation in the highland and Cochabamba valley instead of technical irrigation such as sprinkling or drip irrigation.		X	X	X	X		X
- Large scale *irrigation projects* are needed, such as the Rositas project. Farmers have to be able to rely on water sources. In most of the Santa Cruz lowlands, where cultivation is extensive, the ground water is too deep and saline.		X		X	X		X
- Performing *agricultural research* on new crop varieties and production systems. Bolivia needs to improve yields in order to become competitive.		X		X	X		
- Supply *alternatives for agrochemicals*: Integrated Pest Management solutions, organic fertilizers, etc		X					
- *Consultancy* in GAP, soil management, certification, GlobalGAP, organic, integrated pest management (IPM), etc.		X					X
- *Biomass and recycling technology* (including business case and value chain development). With a growing agricultural sector, there is also an increasing potential for biomass and recycling. As experience and commercial development with these themes are limited, access to the right stakeholders and market should not be underestimated. Possibilities can be found in, for example, sugar cane, rice, coffee, brazil nuts (biomass), plastic (recycling), low grade chia seeds (biofuel, feed), chicken manure (fertilizer).	X				X		X

	Dutch strength	Important	urgent	Awareness	Desired	Gov. enforcement needed	Finance needed
Food safety & animal health							
- *Laboratory services and equipment*. Bolivia lacks (certified and commercial) laboratories that can test fresh or dry products on pesticides, comply with European regulation, and could perform tests such as antibiotics in livestock. See also: Laboratories of Senasag, laboratories of Proinpa, laboratory of CIAT. Veterinary laboratories LIDIVECO and LIDIVET of Senasag or private laboratory PROVETSUR.	X	X		X	X		
- Improve the *cold chain logistics* with better infrastructure. For example cold storage at Santa Cruz airport will be crucial for the export of fresh and frozen products. At a local level it is important that there are incentives for local distributors and merchants to comply with better food safety and monitoring. Larger food brands and exporting companies are more advanced in this theme.	X	X	X			X	X
- *Infrastructure and training to improve animal health*. It is important that cattle farmers provide the right conditions to ensure animal health, even more so when producers are aiming for export markets. Especially smaller farms lack knowledge, practices and financial resources. An adequate service of the national food safety authority Senasag is key.		X			X	X	X
- *Innovative treatment and packaging* for high value grains & oilseeds (chia, quinoa, cacao, coffee), which secures quality characteristics to export markets. Some of the current techniques that are used: fumigation, ozone treatment, individual vacuum packaging. But also for the national food industry it would be interesting to investigate opportunities for packaging technologies and materials.	X	X			X		X
- *Technology and training that improves food safety*, for example in informal abattoirs, where procedures and product testing are completely lacking. Enforcement and government enforcement/control is necessary, for example an obligation and strict control of HACCP.	X	X	X			X	X
Biotechnology							
- *Genetic services and breeding technology*: Specialised services or products to further develop genetic procreation of poultry or cattle.		X			X		
- *Seed improvement*, analysis and testing & certification – Cooperation with INIAF and IPIA.	X	X	X	X	X		X

	Dutch strength	Important	urgent	Awareness	Desired	Gov. enforcement needed	Finance needed
Increase competitiveness & export							
- *Trade and joint ventures* in new food crops: Agribusinesses are looking for opportunities in high value crops they can export. Among these products are for example chia, quinoa, blueberry, organic grains and seeds, processed fruit, cacao, coffee, ground nuts, brazil nuts, açaï and a variety of niche products. Specific companies that are looking for export markets are, for example, De La Sierra (frozen fruit), Totaí (processed lemon), or members of ProChia (chia seeds) and Cabolqui (quinoa).	X	X			X		
- *Processing equipment* for fresh fruit & vegetables (drying, dry-freezing, freezing, pulp). Or other solutions to use surpluses of production peaks, extend shelve life and facilitate export.	X	X			X		X
- *Basic equipment for protected horticulture*. The horticultural production in Bolivia is generally low-tech and underdeveloped. Some farmers choose to move away from horticultural products and switch to agricultural commodities. To secure the offer of fresh fruit and vegetables, horticultural practices and yields should be improved through irrigation, better pesticide usage and crop protection. Another condition for small horticulturists is to gain better access to local markets and become less dependent of intermediaries.	X	X					X
Agri-commodities							
- *Storage silos for grains*: medium and organised small farmers can strengthen their position if they are able to process and store their products instead of selling directly after harvesting.					X		X
- *Technology for precision agriculture* such as monitoring equipment for larger producers: Large agribusinesses manage several tens of thousands hectares. Better monitoring and analysing systems, including drones and satellite mapping improve their performance. Several of these large producers have started using these technologies.	X				X		
- *Alternative solutions for crop protection*: alternatives for toxic pesticides, seed technology, laser systems against birds (sunflower), IPM, increase knowledge on diseases.		X	X		X		
- *Solutions to improve maize production*: Improving seeds, biotechnology, promote hybrids, testing, disease prevention, irrigation, soil management, etc. A reliable and affordable supply of maize is crucial for the poultry (and livestock) industry. Due to extreme drought In 2016 Bolivia depended on extra import from Argentina.		X	X	X	X		

	Dutch strength	Important	urgent	Awareness	Desired	Gov. enforcement needed	Finance needed
Livestock, poultry & meat							
- *Poultry technology*: The poultry sector has become a mature sector in which efficiency and integration will play an increasingly important role. There is demand for climate systems, incubation technology, etc	X				X		X
- *Feed production equipment*: Medium and large poultry (and livestock) producers can save money by not depending on (expensive) external feed sources. They will look for their own silos, extruders, mills and mixers.	X	X			X		X
- Increase number of livestock with *superior genetic breeds* to improve efficiency (time-weight ratio) and quality of meat.	X	X			X		
- Improve *traceability systems* (for bulls and cattle breeds). Since 2011-2012 the first steps were taken of implementing microchips. There is not a fully implemented registry besides a voluntary programme PABCO of Senasag. The producer organisations Asocebu and AB-Brangus maintain their own registers. Traceability is necessary for cattle breeding and export development.		X					
Dairy							
- *Pre-coolers* (plate coolers) for dairy farmers in tropical area (potentially second hand equipment). It is a desire of the dairy industry such as PIL Andina in order to improve milk quality. PIL could even set up a financial system for small famers. It is recommended to execute such a project could with Fedeple.	X	X			X		X
- New *production lines for dairy products* (yoghurt, cheese). Dairy farmers are seeking a (collective) solution for their dependency on the dairy industry and for the low market prices. A concrete example is a cooperative of Mennonites in Santa Cruz.	X				X		X
- *Genetic material* of productive dairy cow breeds. The milk production and efficiency in Santa Cruz can improve by using suitable cow breeds. Heat resistance is an important factor in the selection of new breeds.	X	X		X	X		
- Modern stable equipment, such as *climate and automated milking systems*, including refurbished equipment. It will take time for some producers to take these steps in technology, but it will be an inevitable development.	X	X			X		X

	Dutch strength	Important	urgent	Awareness	Desired	Gov. enforcement needed	Finance needed
Institutional and administrative development							
- G2G (government to government) assistance to *improve the service of Senasag*, the national food safety authority. A next step would be to focus on bilateral phytosanitary agreements to facilitate Bolivian export. Unfortunately this authority lacks financial resources.	X	X	X				X
- *Provide support to cooperatives*. Small farmers can significantly increase their position and negotiation power by being better organised. In soybean there are 14,000 producers, most of which are small farmers. A Mennonite community has taken the initiative to set up a cooperation, which is at a starting phase. But their ambition is high in terms of investments in grain storage and dairy processing facility. These cooperatives fit the political framework of the Morales administration and could benefit greatly from the expert organisations such as Agriterra.	X	X			X		X
- *Implement information systems* and increase farmer access to information about prices, climate, etc. A good example is the Information and Communication System (SIC Santa Cruz) that was developed in Santa Cruz.		X			X		X
- *Planning and administration systems for SME (Small and Medium Enterprises)* to improve production planning and financial administration. The latter is also important to apply for credit with foreign credit suppliers.		X					
Financial							
- Improve access to credit, especially for medium sized companies. The microcredit system for smallholders is relatively well developed and large industries have their ways to get investment capital. The medium sized companies are essential for the Bolivian agricultural sector and often have strong growth potential if they have the means. Among these companies are promising prospects for Oiko credits and Triodos.	X	X		X	X		X

Annex I: SWOT analysis

The SWOT analysis shows the strengths and weaknesses of the Dutch agri-food sector in Bolivia, their competitive advantage and the local circumstances in Bolivia that pose potential opportunities or threats. Bolivian weaknesses can often be translated into opportunities for cooperation.

Strength	Weaknesses
Dutch strength - Agricultural knowledge and expertise (academic, R&D, practice) - Generally solid reputation in Bolivia - Dutch agro-industries are well structured with integrated clusters (potential for collective efforts)	**Dutch weaknesses** - Dutch businesses are not sufficiently present in Bolivia (no priority) - Not all Dutch technology is suitable for Bolivia - Little specific knowledge about the country
Bolivian strength / Opportunities - Strong economic growth until 2006-2015 - Potential growth in the transition of becoming a developed nation - Developing industries with frontrunners that raise the standards - Agricultural potential: quantities of fertile land and climate zones - High level of sector organisation (especially in Santa Cruz region); easy overview of different industries - Strong commercial motivation of businesses - Openness towards foreign contacts and expertise - Labour costs are still relatively low - Membership Mercosur pending - Good trade relations with Peru, Colombia, Ecuador, Venezuela, Cuba. - Preferential tariffs for EU market -	**Bolivian weaknesses / Threats** - High value of Bolivian currency hampers competitiveness and export - Poor infrastructure (e.g. no sea port, cold chain) - Relatively low yields/production compared to neighbouring countries - Protective government and public intervention: food security above export (quota system) - Limited access to credit and high interest - Low performance sanitary authority (Senasag) - Lack of water management and irrigation - Low efficiency; e.g. high losses in grain storage, high mortality in poultry - Lack of skilled workers - Internal market is relatively small with high level of informality - Lack of enforcement of environmental and sanitary laws - Dependency on intermediaries; need for better market access (national and international) - Increasing usage of agrochemicals - Contraband disturbs national market - Statistical data is not always 100% reliable - Insufficient resources and cooperation of public authorities

Opportunities	Threats
- Much is needed on both company level as well as the business environment - Maturing industries need knowledge and technology for further development - Higher national and international standards require better laboratory services - Need for biotechnology, genetics and quality seeds to improve yields and livestock production - Agriculture needs to become more sustainable offering opportunities to innovations/expertise (e.g. reduce residues of pesticides and veterinary drugs) - Water management and irrigation projects are becoming a priority - Potential for storage, from grain silos to innovative products for specialties. Become less dependent of intermediaries and improve product quality - Improvement needed in efficiency and animal health (especially small and medium farmers) - Increasing interest if food processing (e.g. preservation of perishables) and becoming less dependent of imports - Public expenditure and prokects in public state companies - Potential cooperation for G2G for institutional development or technical assistance to public organisations (including Senasag) -	- Competition from Brazil, Argentina, China and USA in agricultural technologies and equipment - Poor access to credit and government policy in Bolivia could hamper or postpone direct commercial opportunities - Low productivity and climate complications decrease earnings and could slow down local investments - Current public policy makes foreign investment less attractive - Legal insecurity of property and land ownership - Corruption and bureaucracy - Informality hampers economic growth for formal enterprises (potential business partners) - Unexpected incidents such as road blocks and climate change - Unsustainable activities (e.g. deforestation) of local businesses could hurt reputation of foreign partners

Annex II: References

Bolivian sources

AB-CREA	Mr. Fernando Romero Pinto	Presidente
Agrotigre	Mr. Matias Meyer	Director
Anapo	Mr. Jaime Hernández Zamora	Gerente de Planificación y Gestión
Anapo	Mr. Rolando Zabala Moreno	Gerente General
APIA	Mr. Lorgio Arano Suárez	Gerente General
APIA	Mr. Pablo Soria Almanza	Jefe de Proyecto / BPA
Asociación Boliviana de Brangus	Mr. Jorge Melgar Bello	Gerente General
Asociación de Avicultores SCR	Mr. Boris Paz	Gerente General
Asociación de Avicultores SCR	Mr. José Miguel Peducasse?	Gerente Técnico
Asociación de Porcinocultores SCR	Mr. Egon Wachtel	Tesorero
Asociación de Porcinocultores SCR	Mr. Pablo Izaguirre	Gerente General
Asociación de productores cañeros	Mr. Roberto Arce Cuéllar	Administrador Asocaña
Asocrale	Mr. Walter Sanchez A.	Gerente General
Asohfruit	Mr. Nué Morrón Carrasco	Presidente
Cadex	Mr. Oswaldo Barriga	Gerente General
Cadex	Mr. José Alberti	Economista
Cadex	Mr. Rafael Riva	Gerente Técnico
CAO	Mr. Edilberto Osinaga Rosado	Gerente General
CAO	Mr. Freddy Suárez Antelo	Primer Vicepresidente
CIAT	Mr. Ernesto Salas García	Director Ejecutivo
Comisión Nacional de Cañeros	Mrs. Piedades Roca Serrano	Presidente
Cooperativa Multiactiva Villa Nueva	Mr. Pablo Vargas Mejía	Gerente General
Cooperativa Multiactiva Villa Nueva	Mr. Johan Peters Banman	Presidente
De la Sierra	Mr. Jaime Barrenechea	Director
Dutch Embassy Lima	Mr. Hans van Mourik	Agregado Comercial Bolivia
Fedeple	Mr. Eduardo Wills Justiniano	Gerente General
Federación de Ganaderos de SCR	Mr. Javier Landivar	Gerente General
Fridosa	Mr. Jaime Barrenechea	Gerente General
Frigor	Mr. José Fernando Cespedes S.	Gerente General
Gob Autónomo Departamental SCR	Mr. Jose Luis Parada Rivero	Asesor General
Gob Autónomo Departamental SCR	Mr. Luis Alberto Alpire Sanchez	Secretario Dep. de Desarrollo Productivo
Granicorp	Mr. Pablo Marcelo Aspetty	Director
Madisa / Chocolike	Mr. Gustavo Bazoberry Pericón	Gerente de Producción
Madisa / Chocolike	Mrs. Laura Lozano	Gerente Productos Propios
PIL Andina	Mr. Sergio Miralles de la Torre	Jefe Nacional Agropecuaria y Recolección
PIL Andina	Mr. Carlos Faldin	Jefe de Calidad
Promasor	Mr. Vicente Gutiérrez	Presidente
Promasor	Mrs. Dina Montero	Gerente General
RVO	Mr. Michel Ridder	Project Adviseur Ondernemen in OS landen
Sofía	Mr. Juan Carlos Anglarill Serrate	Gerente de División Pecuaria
Totaí Citrus	Mr.Christian Job Zelada Tellería	Gerente General
Totaí Citrus	Mr. Bismark Osinaga Rosado	Jefe de Operaciones

Dutch sources or participants of the Expocruz

(The Expocruz 2016 was the start of the factfinding)

Agripoort	Mr. Carlos Molinero	Representante comercial
AMATREX Holland	Mr. Arnout Aarnink	(La Paz)
Control Union	Mr. Gerben Stegeman	Program manager
CRV	Mr. Petrus Dongelmans	(santa Cruz)
Dorset Green Machines BV	Mr. Henno Haaring	Director
FreshlightAgri	Mr. Herman Kranenberg	Manager sales & marketing
Hendriks Genetics	Mr. Marcel Huijsmans	Director Marketing & Communication
ICCO Investments	Mr. Jose Jiménez Laquiguchi	Regional Investment Manager
Kramer	Mr. Wolt Bodewes	(Santa Cruz)
LMB Roelofs	Mr. Wolt Bodewes	(Santa Cruz)
Pas Reform Hatchery Technologies	Mr. Bouke Hamminga	Sales & business development executive
Soil&more	Mr. Aart van den Bos	Managing partner
Tecopor BV	Mr. Theo Everink	Director
Texel4trading	Mr. Nicol Schermer	Entrepreneur
WUR	Mrs. Ria Hulsman	Manager International Cooperation Lat Am

Annex III: Project opportunity: a Mennonite cooperative

Mennonites in Bolivia

Bolivia counts with 71 colonies with approximately 80 thousand Mennonites, a religious or ethnic group of European descent. In the dryer eastern part of Santa Cruz around 60% of the land is cultivated by Mennonites, making it an important group in the agri-sector.

Most Mennonite farmers are smallholders and use traditional and low-tech agricultural practices. They are inventive and very skilled craftsmen, making their own agricultural tools. But their limited integration in modern Bolivian society and lacking access to information make them very depended on middle men and traders, which unfortunately sometimes result in deception or abuse.

In Paraguay Mennonites are much better organised. They have access to international markets via cooperatives such as the Cooperativa Chortitzer, which has established an agribusiness with dairy, meat and agricultural crops. Bolivia does not have a strong tradition of cooperatives, but this has potential to change.

Cooperativa Multiactiva Villa Nueva

The only existing cooperative of Mennonite farmers in Bolivia has just started under the name Cooperativa Multiactiva Villa Nueva.

Cooperativa Multiactiva Villa Nueva: Statistical data

The Mennonite cooperative Multiactiva Villa Nueva was visited during the Fact-finding, which had assembled a group of 10 representatives or members.

The cooperative includes:
- Members: 109
- Hectares: approx. 13,512 ha
- Ambition: growth to 10 colonies
- Member fee: 1,000 USD

Members	Ha. Per member	Total number of ha.
5	1,000	5000
7	300	2100
9	200	1800
17	100	1700
58	50	2900
8	1.5	12
5	0	0
109	**124 (average)**	**13,512**

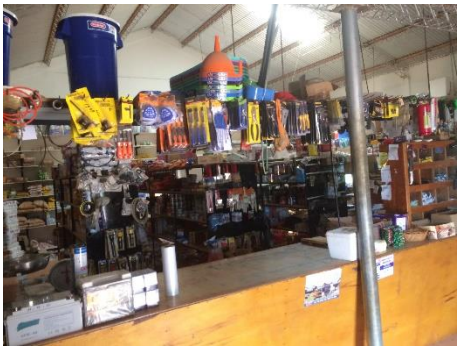
Cooperativa Multiactiva Villa Nueva: Social development

The representatives of the cooperative expressed various ambitions to improve their rural infrastructure and economic independency. Within the cooperative the members could also improve non-agricultural facilities that are needed in their community.

For the cooperation to function well, it needs to show a proof of concept to their community members, some of which are much more traditional minded. Once they show the success of their activities, other Mennonite farmers will almost certainly join the cooperative.

For the social development projects and the strengthening of the cooperative, the members welcome the help of organisations or NGOs that can provide technical assistance.

	**Hospital** Villa Nueva has its own basic, rural hospital. Most equipment is purchased second hand or donated. They would like to have their own trained doctors with Mennonite backgrounds and adequate health care facilities. **Schools** They want to improve the access to knowledge, both agricultural and social.
	**Service centre** There is a common building for the storage of inputs and various tools and equipment. Among the service providers they are planning to contract are veterinarians. **Radio network** Improve the information for farmers (SIC system of the government is focused on the valleys): pricing, trade opportunities, weather, agricultural tips/practices. **Management systems** Professionalise the management of the cooperation (registration, administration) through management systems.


Hardware store


Reunion with milk producers

Cooperativa Multiactiva Villa Nueva: Economic development

The cooperative has worked out plans for two projects:

1) Constructing a dairy production facility of 100,000 litres/day.
2) Building silos for grain storage.

The land for the dairy production is being purchased and the plan (blueprint) for the silos has been drawn up.

Project I: Silos	Storage of grains is an important way for the community to gain more control over the commercialisation of their crops. - Target profit: 10-40 USD per tonne. - Size: storage for 24,000 tonnes. - Needs: finance
Project II: Dairy production facility	With a dairy production facility they hope to increase the price and margin they receive for their milk and dairy products. - Access to markets: School breakfast, supermarkets. - Goal: Become more independent in the dairy sector. Mennonite colonies have contracts ('*cupos*') to supply PIL Andina, but they receive relatively low prices. On the upside they receive advice and technical assistance from PIL. The rest of the milk is processed in an artisanal manner, for example into cheese, or sold fresh on the local markets. - Needs: Finance, dairy specialists

The biggest challenge is to find capital for these projects:

- Large banks are not always eager to finance because of their relation with the large industrials that have their own interests.
- The land of the Mennonite colonies cannot be mortgaged or used as collateral for loans.

Locally handcrafted equipment

Workshop / metalworking

Tractor modified to traditional standards (steel wheels)

Traditional carriage

Annex IV: PSI Projects

For details see: https://aiddata.rvo.nl/programmes

Collection and processing of Acai into certified pulp and powder

To set up a FairWild and ISO 22000 certified Acai collection and processing chain, producing frozen pasteurised Acai pulp, and "freeze-dried" Acai powder.

Pasan-VT Industrial Ltda from Brazil and **Manutata S.A.** from Bolivia will establish a joint venture to set up an Acai processing plant in Guarayos, 300 km north of Santa Cruz. Jointly, the partners will invest in the establishment of a new company dedicated to the processing, packing, cooled transport and international commercialisation of Acai pulp and Acai powder from the Euterpe precatoria.

Harvesting for timber

The establishment of a thinning company that harvests timber from sustainably grown plantations of smallholders, using mobile saw mills and commercialises the timber for the smallholders within Bolivia.

There are no companies providing services to farmers to do the thinnings of their private plantations in the lowlands of Bolivia. The applicant company in this project is **The Cochabamba Project Ltd,** a social enterprise from the UK, investing in sustainable forestry plantations of smallholders in Bolivia. The local partner is the forestry consultancy company **Sicirec Bolivia Ltda**. The third partner is a forestry consultancy company from the Netherlands **Caoba Consultancy**. The three project partners will start a joint venture company to provide the service to farmers to do the thinnings of their private plantations in the lowlands of Bolivia, do the sawing of the small dimensions with mobile saw mills and assist with the marketing of the timber in Bolivia.

Integrated vegetable production green houses innovation

To establish a Greenhouse with packing facility and cold store, for the production and processing of ecologic fresh vegetables.

Production of vegetables in Bolivia is still very primitive, based on old traditional practices that have not incorporated any innovation for decades. The cultivation takes place on open fields, exposed to damage by animals/insects and climatic conditions. Vegetables are therefore treated with large quantities of agrotoxics, and during the heavy rain season (sometimes from October to March) no production is possible. Overall, productivity is very low and product quality is poor. To improve this situation **Geraldo van den Broek Ltd** from Holambra in Brasil, and **Hacienda del Señor S.R.L.** from Santa Cruz de la Sierra in Bolivia, will form a joint venture to implement a modern vegetable production farm with a greenhouse, as well as a packing station, including cold store. They will produce top quality fresh tomatoes, paprika's and cucumbers (other vegetables will be added in a later stage) according to GlobalGAP and HACCP guidelines.

Invalsa Cacao

To start a centralised organic cacao processing facility in the Palos Blancos region, with a fermentation plant for high quality, dried cacao, while at the same time increasing cacao production in the region with 700 ha per year.

Despite its excellent climatic conditions to produce high-quality cacao, Bolivia does not have a well-developed cacao-processing industry. Its cacao production is decreasing, farmers are facing problems with diseases and pests and the quality of the fermented beans is not stable. This project aims to transform the Bolivian cacao industry by introducing a centralised cacao processing plant, resulting in high quality, organic- certified fermented cacao beans for the international specialty market. The project will be implemented by the American company **Whitmore Family Enterprises LLC** dba **Taza Chocolate,** a producer of artisanally crafted stone-ground chocolate bars and the Bolivian company **Industrias Valverde S.A. (Invalsa),** a sourcing company of coffee and cacao.

Invalsa Coffee smallholder extension and outreach programme

To construct a network of smallholder-owned and operated, high-capacity washing stations in Bolivia, and increase organic certified coffee production and productivity through an intensive training and extension programme for smallholders led by professional agronomic trainers. The extension and outreach programme include a network of three to four coffee demonstration farms of 10 ha each in Bolivia and a nursery for high quality coffee genetics.

The partners will construct a dry mill to ensure efficient and high quality export processing in La Paz. In essence, the project's aim is to move Bolivian coffee farmers from subsistence-based, to commercial farming methods.

The applicant is **Green Valley Trading Company** dba **Invalsa Coffee**, an USA based company active in coffee trading from several Latin American countries since 2004. The owner is Nelson Valverde. The local partner is **Industrias Valverde S.A.** (Invalsa), a Bolivian corporation founded in 2003 that is owned by both Nelson Valverde (51%) and his brother Jorge Valverde (49%). Invalsa is engaged in coffee trading and is partner in PSI12/BO/25, starting a cocoa processing facility in Alto Beni.

Plant of bio-products for sustainable agriculture

To develop an organic certified production facility for the production and commercialisation throughout Bolivia of environmentally friendly agricultural bio-products.

PROINPA is a Bolivian foundation dedicated to basic and applied research to develop technologies for sustainable and organic production. It has spent decades of technical assistance to small farmers working together in the development of bio-products. PROINPA has isolated native strains of beneficial micro-organisms which are used as organic inputs in the formulation of bio-products. **Bio Top SRL** is a company formed by PROINPA that produces and markets on a very small scale biofertilisers based on these beneficial micro-organisms. **Biosa ApS** is a Danish company dedicated to the production, development and application of probiotics within the areas of human health, animal welfare, waste treatment and other environmental areas. The three business partners work together since 2010, but will now start a joint venture company in Cochabamba to produce and market four different types of bio-fertilisers and growth promoters.

Processing barn eggs into liquid egg and egg powder

To process fresh eggs into pasteurised and liquid egg products with a production volume of 75 tons egg powder and 820 tons liquid egg.

Industrial processing of fresh eggs into pasteurized and liquid egg products is a new industry in Bolivia. Local food industry now relies using raw eggs in shell, which poses serious food safety risks. Eggs and egg-containing foods have been identified as the vehicle in roughly 80% of known-source Salmonella infections. Bolivia imported 211 tons of powdered egg in 2012. The applicant is **Ovoprot International S.A.**, the leading egg processing company in Argentina. The first local partner is **Avicola Modelo Bolivia S.R.L.**. Avicola Modelo has its own egg production farm (20,0000 layers), a hatchery and a feed production plant. The third partner, **Granja San Miguel "Cesar Cuadros RAU"**, has a production capacity of 92,000 layers. The partners will establish a joint venture. The project is located in Santa Cruz de la Sierra.

Processing of chia seed into value added products

To set up a dedicated chia seed processing facility, with a capacity for raw seeds and chia oil.

Functional Products S.A. and **Productos Funcionales DelAgro S.R.L.**, facing a continuous strong growth in demand, now decided to constitute a joint venture to establish a dedicated chia seed processing facility, designed for the small chia seeds, which will substantially reduce the handling losses. At the same time, production of chia seeds will be increased 3-fold, by expanding the cultivation areas, from 1,500 ha to 4,200 ha. This will be achieved by addition of at least 30 new outgrowers, as well as expansion of the cultivated areas with current outgrowers. The dedicated processing facility will be unique and completely new for Bolivia, and will also include the first (value adding) production of chia oil for consumption.

Processing plant for bovine sub products

To set up a joint venture for the production of concentrated liquid plasma, bovine serum and bile paste annually for the pharmaceutical, feed and food industry.

The applicant, **Panymex International S.A.** from Panama, and the local partner **Sociedad Comercial Agropecuaria Tusequis Ltda**, will establish a processing plant for the production of concentrated liquid plasma, bovine serum and bile paste. Inputs for this process are blood and bile from slaughterhouses, which are currently dumped in the waste water system. The project constitutes an environmental solution for the many small abattoirs. A joint venture will be set up in Santa Cruz de la Sierra, to collect the blood and bile (which represent more than 50% of the pollution generated at the abattoir) and process these raw materials into high value ingredients for the food, feed and pharmaceutical industry, with state-of-the-art technologies. Within the project, the joint venture will cooperate with 4 major abattoirs in the Santa Cruz area, for the collection of blood and bile.

Reforestation project in Santa Cruz, Bolivia

To establish a reforestation service-providing company for commercial farmers in Santa Cruz, offering the integrated service of land use planning, reforestation planning, seedling production of indigenous species, plantation establishment and maintenance with a maximum capacity of 500,000 seedlings and/or 1,250 ha of reforested areas per year.

In the Department of Santa Cruz, over four million hectares of forests have been cleared, of which approximately three million hectares illegally. In 2013 a new law was approved, demanding farmers to reforest 10% of these originally classified forest areas. Failure to comply with this new law, make farms liable to reversion to the State. Therefore, a huge market demand for reforestation services exists. The two project partners, **Futuro Forestal S.A.** from Panama and **Canavalia Servicios Verdes** from Bolivia will start an integrated reforestation service-providing company for commercial farmers in Santa Cruz. It will offer the integrated service of land use planning, reforestation planning, seedling production of indigenous hardwood species, plantation establishment and maintenance with a maximum capacity of 500,000 seedlings or 1,250 ha of reforested areas per year. The company will substitute the seedlings in plastic bags for seedlings in paper sleeves, reducing the environmental impact and improving the root systems development. Further, it will introduce a modular seedling handling and transport system, ensuring plants to arrive in prime conditions at the planting site.

Setting up a new and innovative organic quinoa drying plant in Bolivia

To improve the quality of the organic quinoa processing sector in Bolivia by setting up a Fair Trade and organic certified quinoa cleaning and drying facility.

The applicant **Delphi Organic GmbH** of Germany is an import company specialised in certified organic commodities. It is very interested to buy good quality organic quinoa real from Bolivia. Their trading partner in Bolivia is the company **SINDAN Organic SRL** based in El Alto near La Paz. SINDAN Organic SRL is a trading and processing company of organic food products like quinoa, quinoa flakes and flour, amaranth, chia, sesame and cañahua. The two partners will form a joint venture for the cleaning and drying of quinoa. The processing facility will be Fair Trade, organic and ISO 9001 and ISO 22000 certified and work with a state of the art, semi-automated processing line. In order to guarantee the 100% organic purity of the quinoa an ISO 17025 certified laboratory will be started to monitor the residue content of pesticides. The company will train and advice 200 farmers on organic production, good agricultural practices and organise its organic and Fair Trade certification.

Tarwi based products in Bolivia: a market opportunity

To improve the production, industrial processing and commercialisation of Tarwi. The project will produce 32 tons fresh bitterless Tarwi, 14 tons processed Tarwi and 90 tons dried Tarwi for export to Ecuador.

The project will improve the production, industrial processing and commercialisation of Tarwi. The production will be improved by giving technical support to 170 small scale farmers in the northern region of La Paz with a total acreage of 85 ha and an expected yield of 77 tons. The remaining 82 tons of Tarwi needed for processing and export in the framework of the project, will be purchased from Tarwi production areas of Carabuco and Lake Titicaca. The processing will be done in Cochabamba. The project will produce 32 tons fresh bitterless Tarwi, 14 tons processed Tarwi and 90 tons dried Tarwi for export to Ecuador. The applicant from Ecuador, **Corporacion CASA - CORPOCAS**, is established in 2006 and dedicated to the industrial processing of Tarwi. The local partner, **Marconi Industries**, is established in 2006 with main activities in the

food sector. The third partner, **PROINPA Foundation** is a Bolivian organisation established in 1990 and dedicated to research and technology transfer in agriculture. The partners will establish a joint venture. The project will enlarge the consumption of the very nutritious Tarwi among the Bolivian population.

Value added sesame products

To set up a sesame processing plant with a capacity to produce sesame paste, sesame flour, sesame oil, as well as retail-packed sesame seeds.

Organic Assistance BV from the Netherlands, through its subsidiary **Dutch Organic International Trade BV (DO-IT)**, imports 100% organic food ingredients and consumer products, based on long term agreements with suppliers in the sourcing countries. For over five years it has been buying organic sesame seeds in bulk from **Latco International SRL**, Bolivia's largest sesame exporter. Latco International SRL sources sesame seeds through its outgrowers scheme, comprising 1,200 small farmers, and operates cleaning and grading facilities, as well as a hulling line, at its plant in Santa Cruz de la Sierra. To increase the added value of the products the trade partners are planning a joint venture to set up a processing facility, the first of its kind in Bolivia, to produce sesame paste, sesame oil and sesame flour, as well as retail-packed sesame seeds for export. The plant will be equipped with advanced selection and sorting machinery, a laboratory for quality control and a climate-controlled store for finished products.

Annex V: Trade fairs and events

Trade fairs can be social (regional) events with an informal atmosphere and often combining several industries in the region. Other events are focused on a specific sector and exchange of expertise. The larger trade fairs are the international fair Expocruz and the International Fair of Cochabamba (FIC), which offer a podium for international exhibitors and attract visitors from all over Bolivia.

EXPOCRUZ	Industries	Multiple industries, including agriculture and food.
	Region	Santa Cruz
	Exhibitors	2,300
	Countries	21
	Visitors	500,000
	Nice to know #1	Largest business event in Bolivia.
	Nice to know #2	Expocruz moves 270 million USD in potential business and activities.
	Next/last event	September 2017
FIC	Industries	Multiple industries
	Region	Cochabamba
	Exhibitors	1,000
	Countries	28
	Visitors	350,000
	Nice to know #1	Second largest business event in Bolivia.
	Nice to know #2	FIC = Feria Internacional de Cochabamba.
	Next/last event	April/May 2017
Expo Maquina	Industries	Machinery, multiple sector
	Region	Santa cruz
	Exhibitors	100
	Visitors	20,000
	Next/last event	November 2016
Expo Chapare	Industries	Multiple sector (e.g. agroindustry, commerce and construction)
	Region	Chapare, Cochabamba
	Exhibitors	140
	Visitors	20,000
	Next/last event	March 2017
EXPONFOOD	Industries	Food and Gastronomy
	Region	Santa Cruz
	Exhibitors	30-50
	Next/last event	October 2016
Expocaña	Industries	Trade fair for sugar cane and sugar industries
	Region	Santa Cruz
	Next/last event	July 2015
Expo soya	Industries	Local event for soy bean, but also for other crops, machinery, etc
	Region	Santa Cruz
	Next/last event	March 2016
Expo Ichilo	Industries	Agriculture, commerce, industrial
	Region	Santa Cruz
	Next/last event	June 2017

Please also refer to trade shows in Bolivia on PortalFerias.com

Annex VI: Information & links

General Sources

See also chapter: Public and private organisations

ITC Trademap	International Trade Center | Trade Map
Faostat	Food and Agriculture Organization of the United Nations – Statistics Division
INE	Instituto Nacional de Estadística de Bolivia
CIA World Factbook	Central Intelligence Agency – The World Factbook
CAO	Cámara Agropecuaria del Oriente – Números de Nuestra Tierra

Business contacts

See also chapter: Public and private organisations – sector associations

IBCE	Directorio de exportadores, importadores y operadores del comercio exterior de Bolivia 2016

Economy / Agriculture

Cumbre Agropecuaria Sembrando Bolivia (Agricultural Summit Santa Cruz)	Cedib	2015 apr
Censo Agropecuario 2013 Bolivia	INE	2015 dec
Encuesta Nacional Agropecuaria – ENA 2008	INE / MDRyT	2009 nov
Bolivia y Santa Cruz en Cifras	CAINCO	2016 sept
Estadísticas de Exportaciones por Departamentos	IBCE	2015
Diagnósticos Sectoriales - Agropecuario	UDAPE	2015 sept
Evaluación de desempeño del sector agropecuario en el departamento de Santa Cruz – gestión 2015	CAO	2015 dec
Evaluación de desempeño del sector agropecuario en el departamento de Santa Cruz – gestión 2014	CAO	2014 dec
Evaluación de desempeño del sector agropecuario en el departamento de Santa Cruz – gestión 2013	CAO	2013 dec
Construcción de ventajas competitivas en Bolivia. Las cadenas productivas de soya; quinua; uvas, vinos y singanis; maderas; cueros; textiles y confecciones	CAF	2007

Government policy & programmes

Agenda Patriotica 2025	Ministerio de Autonomias	2013
Plan del sector desarrollo agropecuario 2014-2018 "Hacia el 2025"	MDRyT	2014 jan
Marco de programación de país FAO Bolivia 2013-2017	FAO	2012 dec

SANTA CRUZ: PLAN FOR SOIL USE		
SOIL USE	**AREA in Ha.**	**%**
Intensive agricultural use	2.524.200	6,81%
Protective crops	218.900	0,59%
Silvopasture agriculture	1.057.300	2,85%
Extensive agriculture	107.300	0,29%
Irrigated farming	222.100	0,60%
Conservation forest and silvopasture exploitation	11.718.500	31,62%
Extensive livestock farming	6.507.200	17,56%
Intensive livestock farming	400.600	1,08%
Livestock and conservation	3.972.500	10,72%
Protection of fauna and conservation of species	9.358.100	25,25%
Other Uses	975.300	2,63%
TOTAL	**37.062.000**	**100,00%**

Source: CAO

News sources

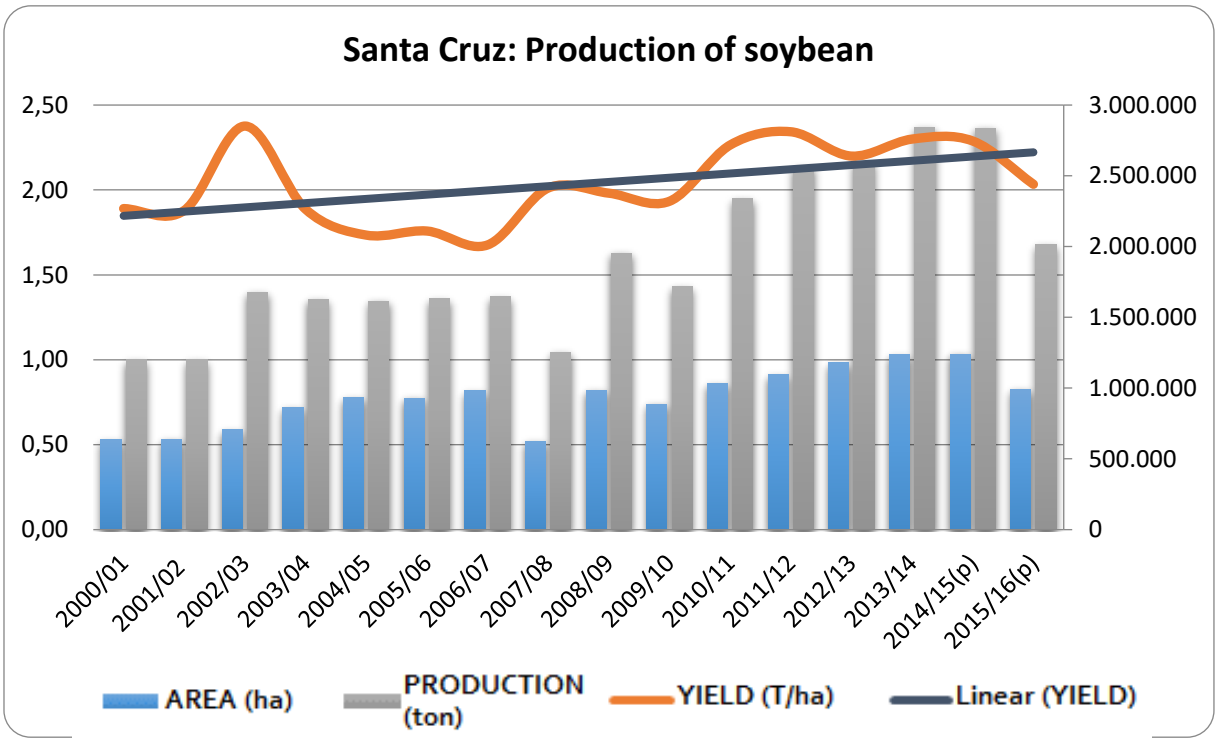
Bolivia se apresta a sortear otro año complicado en alimentos	Los Tiempos	2017 jan
Foro aborda la necesidad de producir alimentos usando la biotecnología	Los Tiempos	2016 sep
Santa Cruz inaugura su centro de biotecnología	Los Tiempos	2016 aug
Bolivia - big changes planned for agriculture	Latin America Bureau	2015 jun
How soya wealth is changing the Bolivia's Santa Cruz province	Financial Times	2015 oct
Lessons from Bolivia: re-nationalising hydrocarbon industry	Open Democracy UK	2014 nov
Ingresos del IDH y regalías del gas caerán hasta 35%	Pagina Siete	2016 sep
En Bolivia la inversión extranjera directa neta cae en 73% al primer trimestre de 2016	Eju!	2016 sep
En Bolivia hay más cultivos de soya, caña de azúcar, papa y maíz	La Razón	2016 may
Población ganadera en Bolivia creció un 22% durante la última década	Economía Bolivia	2016 apr
Gobierno libera maíz y sorgo	El Diario	2014 oct
Santa Cruz, motor de la economía de Bolivia, cumple 205 años	Bolivia Emprende	2015 sept
Resultados del censo agropecuario 2013: Los Agricultores paceños detectan 3 serios problemas	Notiboliviarural	2014 sep

El Deber	http://www.eldeber.com.bo	Bolivia
La Razón	http://www.la-razon.com	Bolivia
El Día	https://www.eldia.com.bo	Bolivia
Bolivia Emprende	http://boliviaemprende.com	Bolivia
Pagina Siete	http://www.paginasiete.bo	Bolivia
Notiboliviarural	http://www.notiboliviarural.com	Bolivia
Los Tiempos	http://www.lostiempos.com	Bolivia
Bolivia.com	http://www.bolivia.com	Bolivia
Fundacruz	http://www.fundacruz.org.bo	Bolivia
eabolivia	http://www.eabolivia.com	Bolivia
El Diario	http://www.eldiario.net	Bolivia
Correo del Sur	http://correodelsur.com	Bolivia
Infoagro	http://www.infoagro.com	International
Freshplaza	http://www.freshplaza.com	International
WATTagnet	http://www.wattagnet.com	International
Poultry World	http://www.poultryworld.net	International
All About Feed	http://www.allaboutfeed.net	International
Dairy Global	http://www.dairyglobal.net	International
Pig Progress	http://www.pigprogress.net	International

Annex VII: Inputs, machinery and feed

Importaciones Gestión 2014	APIA	2014
Construcción de la Planta de Urea registra 96% de avance e ingresa a su fase final	YPFB	2016 sep
Bolivia ya se ayuda de drones en más del 15% de su suelo agrícola	Infodron	2016 aug
La revolución de los drones en Bolivia va de la mano de la agricultura	Economía Bolivia	2015 may
Tecnología agrícola de precisión permite reducir costos de producción al agricultor	Notiboliviarural.com	2015 nov
Bolivia - Tractors and Agricultural Machinery	Export.gov	2016 aug
Bolivia - Pesticides	Export.gov	2016 may
Alltech 2015 Global Feed Survey	Alltech	2015
Alltech 2016 Global Feed Survey Data	Alltech	2016
Estudio de Mercado Alimento para Animales en Bolivia	ProChile	2011 jun
New feed mill opens in Eastern Bolivia	WATTagnet	2016 feb

Annex VIII: Soybean



Source: CAO, Anapo

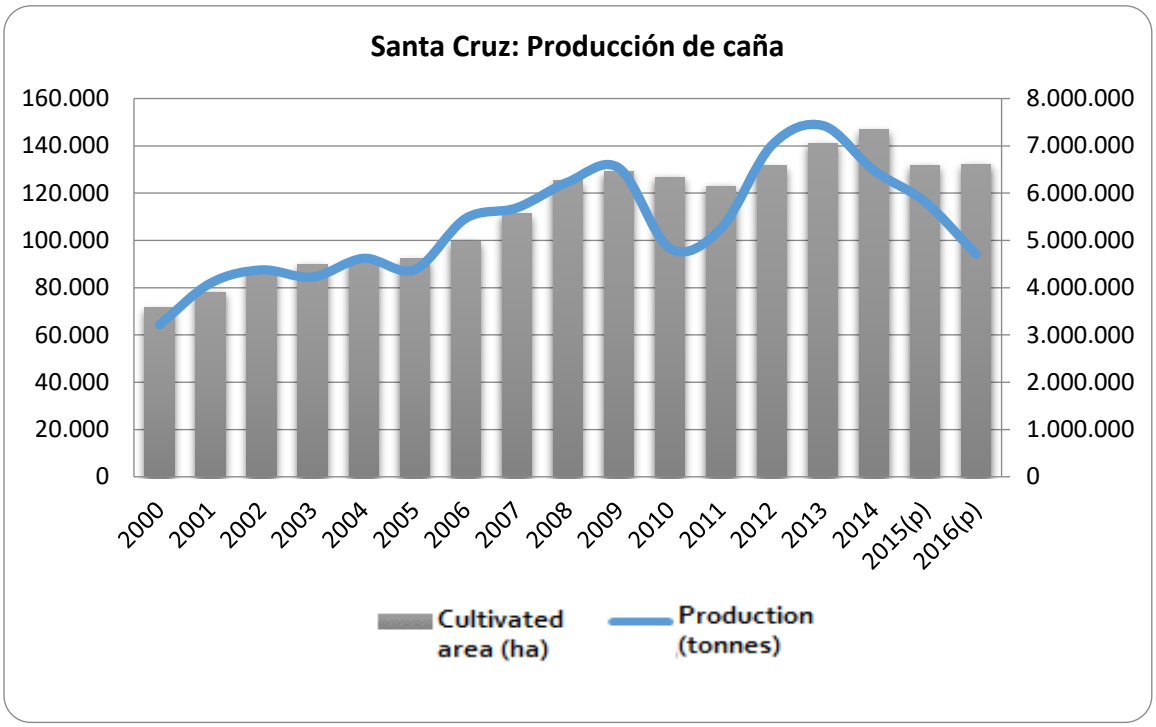
Sources

Caracterización y Analisis de la Competitividad del Sector Soya en Bolivia	n.a.	n.a.
Anapo en Cifras – boletín estadístico mensual	Anapo	2016 jul
Fertilización en Soja. Situación actual y perspectivas en Argentina, Bolivia y Uruguay	ACSOJA	n.a.
Fertilización moderna en el cultivo de soya en Santa Cruz	Fundacruz / NORSA	
Estudio Mercado del Grano de Soya	AEMP	2013 sep
Fertilización en soja, situación actual y perspectivas en Argentina, Bolivia y Uruguay	n.a.	n.a.
La Soya en Bolivia, ¿El "Grano de oro" que no brilla?	Mamerto Pérez	2008
Perspectivas de la soya hacia la amplificación de la frontera agrícola	Anapo	n.a.
The Great Soy Expansion: Brazilian Land Grabs in Eastern Bolivia	Food First	2013

News sources

Autorizan la exportación de 100 mil toneladas de soya	Pagina Siete	2016 apr
La soya boliviana pierde su competitividad en la región	El Día	2016 mar
ANAPO: Cosecha de verano 2015 finalizó con 2,1 millones de toneladas de soya	Notiboliviarural.com	2015 may
Torta, aceite de soya y alcohol etílico los que más se exportan	Bolivia Emprende	2015 dec
Gobierno boliviano fija precios para la harina y torta de soya	Eabolivia.com	2011 jul

Annex IX: Sugar cane



Source: CAO, Organización Técnica de la Agroindustria (OTAI)

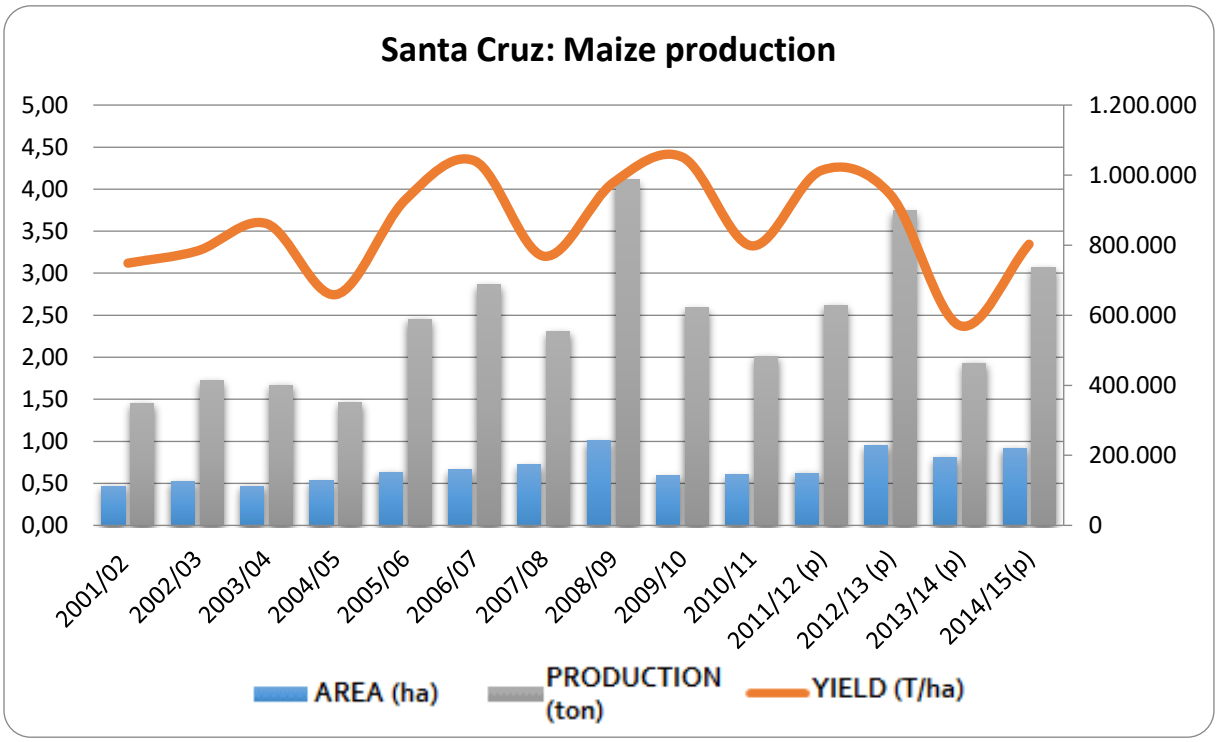
Sources

Child labour on sugar cane plantations in Bolivia	IREWOC	2009 jan
Historia del sector azucarero Bolivia	IBCE	2010 apr

News sources

Triplican rendimientos de caña con sistema de fertiriego en propiedad Tabacal	Notiboliviarural	2016 may
Rendimiento de la caña de azúcar baja en 40% por la sequía	Los Tiempos	2016 aug
Ingenios azucareros solo usan 65% de capacidad instalada	El Día	2015 apr
Another 700 hectares of Bolivian rainforest lost to sugarcane surge	Mongabay	2016 nov
Todo sobre el azucar en Bolivia	Azucar Bolivia Blogspot	n.a.

Annex X: Maize

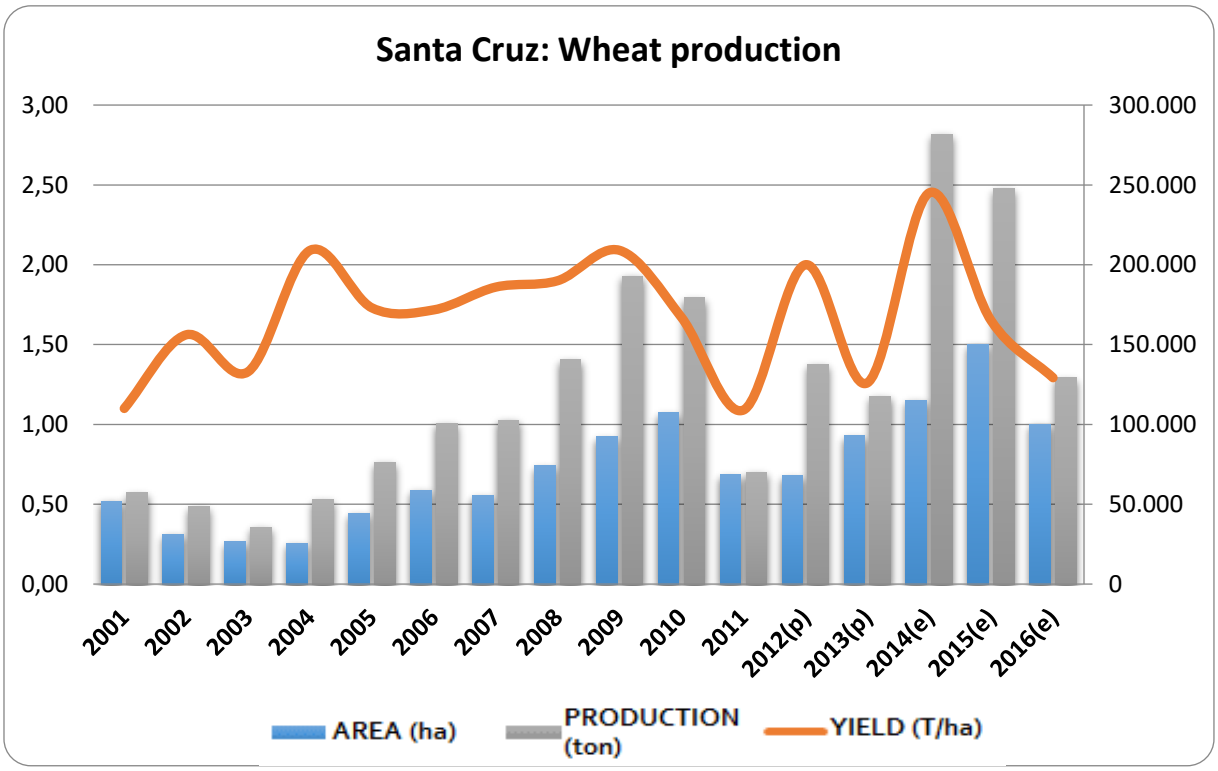


Source: CAO, PROMASOR

Sources & news sources

1ra Cumbre Regional del Maíz en el Chaco Boliviano	Proagro	2011 nov
Bolivia con bajos rendimientos en la producción de maíz	El Día	2015 oct
INIAF: Bolivia alcanzó una producción de 1,2 millones de toneladas de maíz con excedente para exportar	Notiboliviarural	2015 oct
Grave déficit de maíz en Bolivia: faltan 700 mil toneladas	Eju!	2016 jul

Annex XI: Wheat

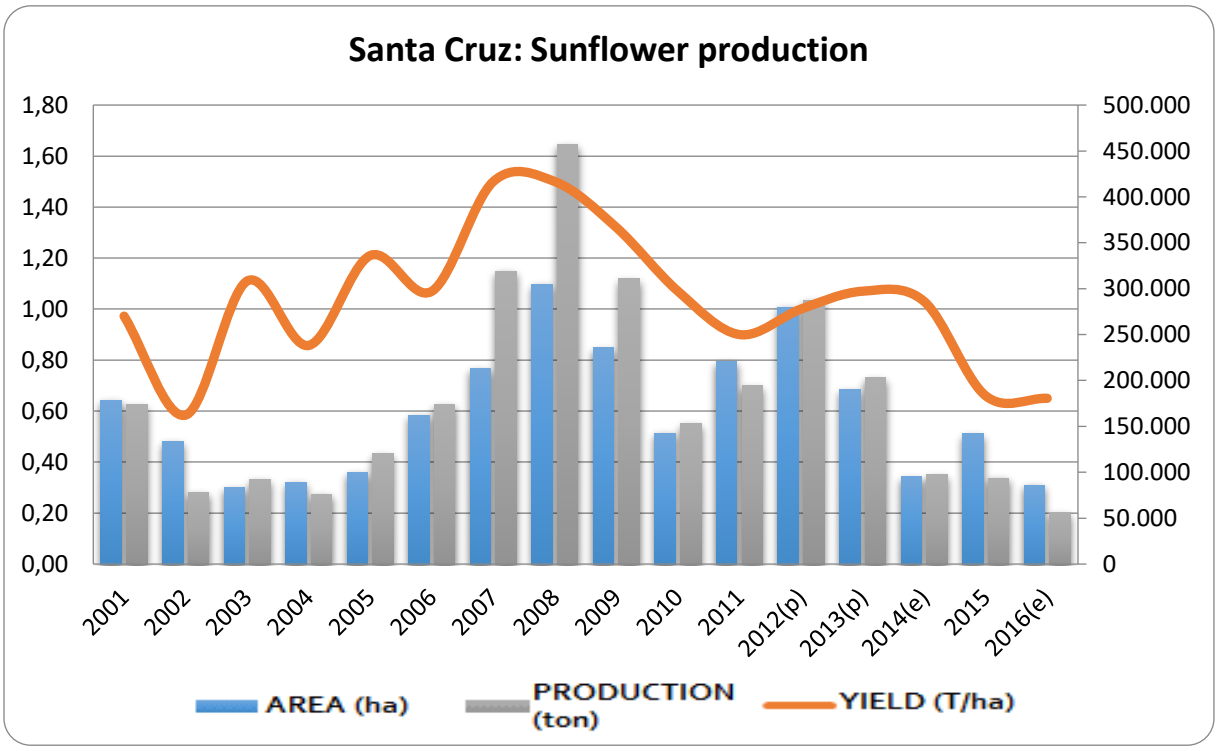


Source: CAO, Anapo

Sources & news sources

Bolivia - wheat	Export.gov	2016 oct
Baja producción obliga al país a importar trigo	El Diario	2016 feb
Trigo: En Bolivia ultimos 10 años el rendimiento promedio es de 1,2 toneladas por hectárea	Notiboliviarural	2015 nov
Producción alta de trigo desfavorecida por precio	Correo del sur	2015 sept

Annex XII: Sunflower

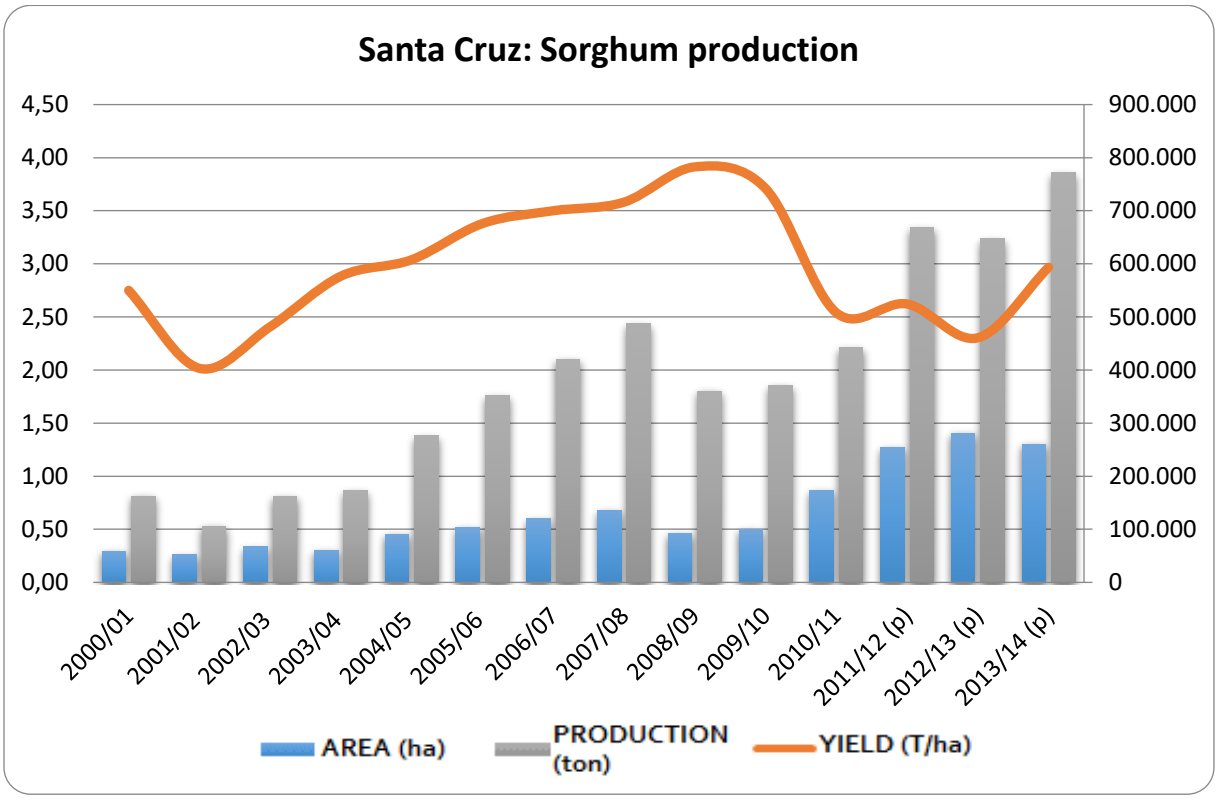


Source: CAO, Anapo

Sources & news sources

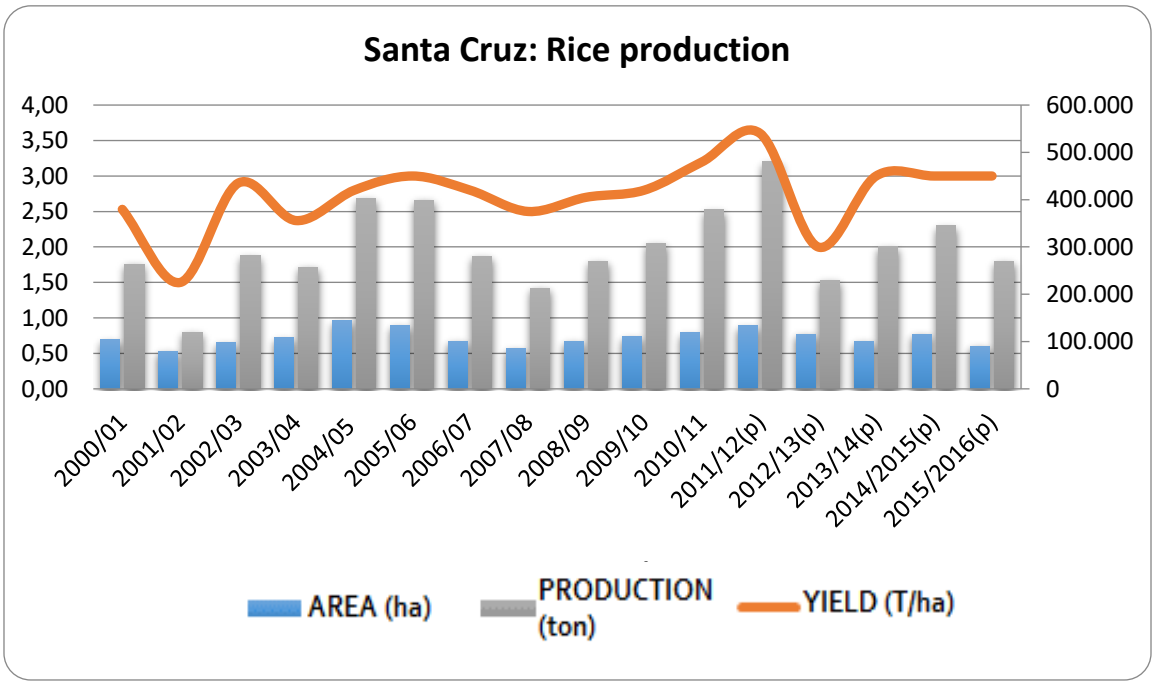
Baja la producción de girasol debido a la excesiva humedad	Correo del sur	2015 aug
Alertan por baja producción de girasol este año	La Razón	2015 aug

Annex XIII: sorgum



Source: CAO, PROMASOR

Annex XIV: Rice

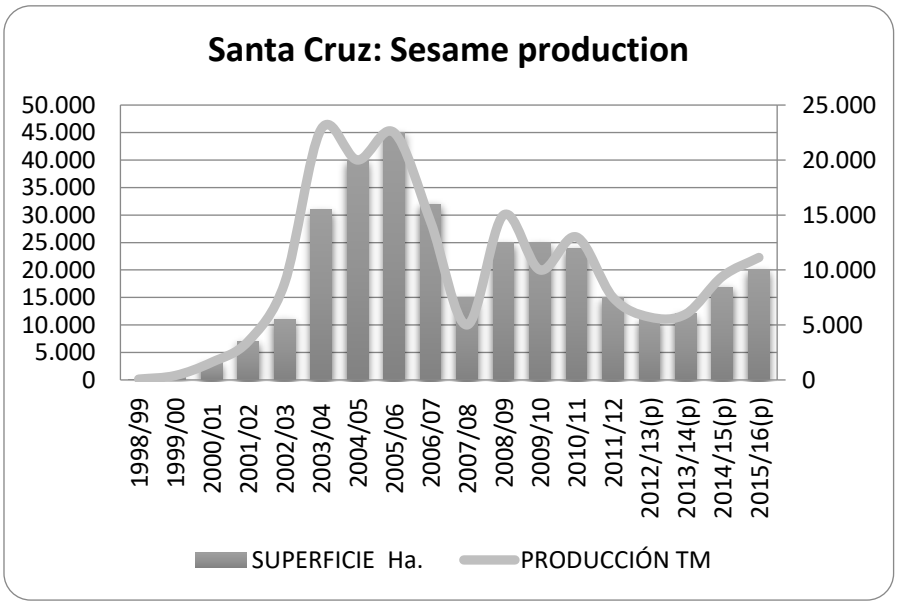


Source: CAO, FENCA

Sources & news sources

Bolivia tiene el rendimiento de arroz más bajo de la región	El Día	2016 apr
Solo 8% de cultivos de arroz tiene riego	El Día	2015 feb

Annex XV: Sesame



Source: CAO, SIPREM

Annex XVI: Other crops

Sources & news sources

Potencial de Mercado para Frutas Frescas	IBCE	2016 may
Bolivia is the largest producer of organic cocoa!!	Bolivian Thoughts	2011 dec
Bolivia only exports 14% of its fresh fruits	Freshplaza	2016 jan
Bolivia Food imports grew by 93% in five years	Freshplaza	2015 mar
La banana ya le ganó a la coca	Información Independiente	2010 jul
Producción de café disminuye en 77,8% por falta de apoyo	Página Siete	2016 jul

Annex XVII: Poultry

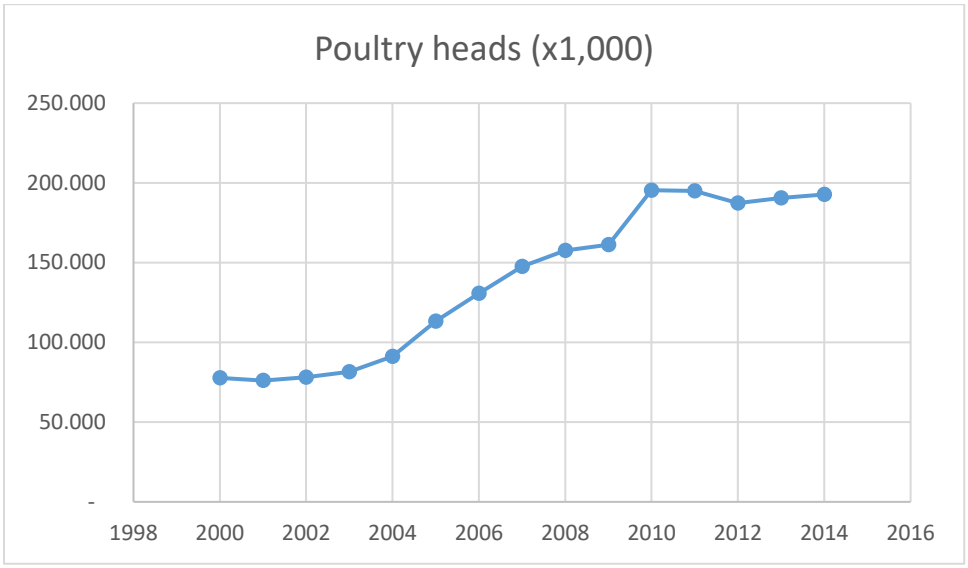
BOLIVIA: Production of broilers (in 1,000 birds)								
years	CBBA	%	SCZ	%	Others	%	Totals	Growth (%)
1993	22,150	60,27	12,528	34,09	2,075	5,65	36,753	-
1994	30,540	62,24	15,552	31,69	2,980	6,07	49,072	33,52
1995	32,860	64,90	14,221	28,09	3,550	7,01	50,631	3,18
1996	34,370	61,69	17,285	31,02	4,060	7,29	55,715	10,04
1997	36,290	60,38	19,652	32,70	4,160	6,92	60,102	7,87
1998	42,190	59,32	24,679	34,70	4,250	5,98	71,119	18,33
1999	46,030	59,85	26,534	34,50	4,350	5,66	76,914	8,15
2000	41,760	59,79	23,786	34,05	4,300	6,16	69,846	-9,19
2001	38,660	57,98	23,826	35,73	4,190	6,28	66,676	-4,54
2002	39,310	56,96	25,450	36,88	4,250	6,16	69,010	3,50
2003	41,670	56,81	27,168	37,04	4,510	6,15	73,348	6,29
2004	46,870	57,19	30,350	37,03	4,730	5,77	81,950	11,73
2005	55,250	54,18	41,471	40,67	5,260	5,16	101,981	24,44
2006	58,200	49,17	53,608	45,29	6,567	5,55	118,375	16,08
2007	66,000	49,34	60,890	45,52	6,880	5,14	133,770	13,01
2008	57,871	43,38	64,344	48,23	11,201	8,40	133,416	-0,26
2009	68,389	45,22	72,339	47,83	10,517	6,95	151,245	13,36
2010	68,311	42,25	79,450	49,14	13,919	9,61	161,680	6,90
2011	60,023	40,69	75,927	51,47	12,534	8,50	148,484	-8,76
2012	61,394	37,34	89,009	54,14	14,017	8,52	164,420	11,46
2013	77,511	43,07	91,046	50,59	11,401	6,34	179,958	9,45
2014*	80,010	41,11	102,570	52,71	12,024	6,18	194,604	8,14

Source: ADA Santa Cruz y ADA Cochabamba, Elaboration: CAO-SIPREM

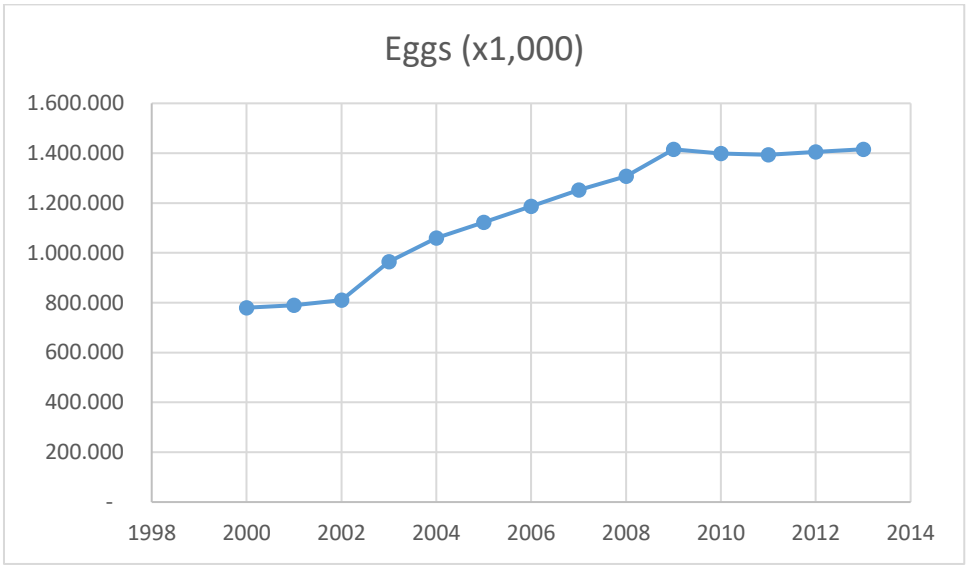
BOLIVIA: TOTAL EXISTENCE OF GRILLE BIRDS PER YEAR, ACCORDING TO DEPARTMENT
(In numbers of birds)

DESCRIPTION	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	20091	2011(p)	2012(p)
TOTAL	77.659.372	76.039.201	78.192.974	81.593.469	91.117.562	113.275.881	130.767.989	147.501.085	157.667.463	161.268.733	198.380.417	195.000.662	195.367.524
Chuquisaca	1.166.911	1.133.686	1.155.906	1.214.510	1.236.371	1.335.281	1.515.945	1.668.449	1.701.150	1.735.667	1.760.837	1.822.466	1.793.941
La paz	1.656.376	1.623.437	1.634.476	1.733.467	1.767.122	1.933.373	2.122.780	2.322.343	2.433.361	2.475.733	2.500.491	2.575.505	2.541.391
Cochabamba	46.397.638	44.789.867	45.066.667	46.300.001	52.077.778	61.388.890	64.666.667	73.333.333	82.411.111	85.225.556	103.211.111	104.422.222	103.067.222
Oruro													
Potosí	150.822	165.046	166.631	179.462	180.933	182.453	188.023	191.897	184.560	190.582	192.488	202.112	197.892
Tarija	1.282.659	1.249.309	1.268.108	1.350.032	1.512.158	1.788.766	2.198.689	1.954.170	2.034.839	2.117.541	2.128.129	2.255.817	2.201.433
Santa Cruz	26.195.585	26.240.229	28.050.946	29.921.008	33.424.776	45.673.219	59.040.001	67.059.885	67.858.372	68.471.841	87.500.360	82.559.449	84.439.926
Beni	743.822	763.916	776.139	820.146	843.356	898.005	959.878	888.990	955.766	962.577	997.230	1.067.036	1.032.499
Pando	65.560	73.711	74.102	74.843	75.067	75.893	76.007	82.017	88.303	89.236	89.771	96.055	93.220

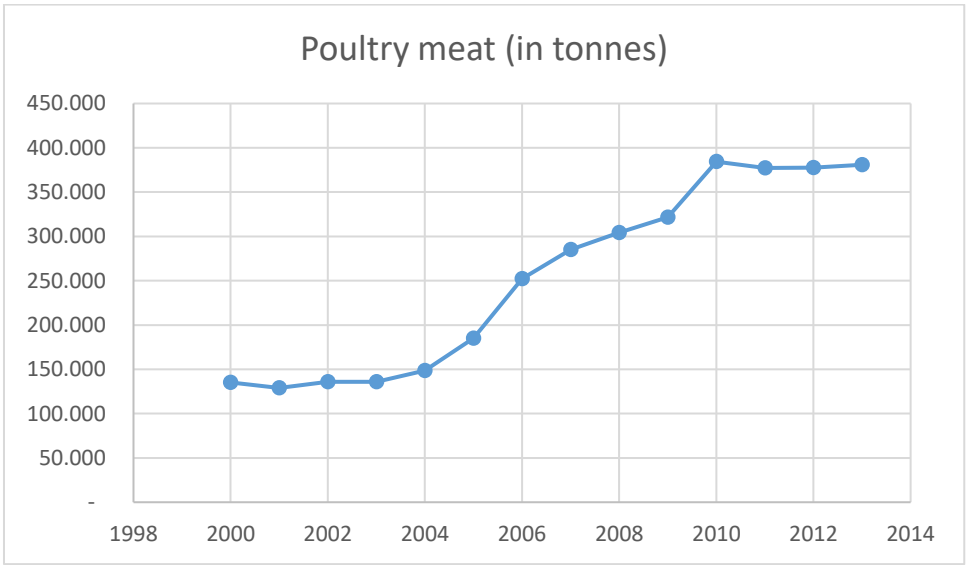
Source: INSTITUTO NACIONAL DE ESTADISTICA - MINISTERIO DE DESARROLLO RURAL Y TIERRAS
(p): Preliminary



Source: FAO



Source: FAO



Source: FAO

BOLIVIA: Egg production (in 1,000 units)								
years	**CBBA**	**%**	**SCZ**	**%**	**Others**	**%**	**Totals**	**Growth (%)**
1993	118,820	23,78	356,958	71,45	23,789	4,76	499,567	-
1994	155,200	28,70	359,603	66,54	25,736	4,76	540,539	8,20
1995	190,100	30,22	408,958	65,01	30,000	4,77	629,058	16,38
1996	198,700	31,91	394,024	63,27	30,000	4,82	622,724	-1,01
1997	196,100	29,24	443,636	66,14	31,000	4,62	670,736	7,71
1998	205,570	26,05	552,033	69,96	31,500	3,99	789,103	17,65
1999	214,650	26,16	572,855	69,83	32,880	4,01	820,385	3,96
2000	206,550	25,80	559,881	69,94	34,030	4,25	800,461	-2,43
2001	211,940	25,87	572,404	69,87	34,850	4,25	819,194	2,34
2002	214,520	25,68	585,200	70,05	35,690	4,27	835,410	1,98
2003	220,960	27,19	554,986	68,29	36,760	4,52	812,706	-2,72
2004	228,870	26,86	585,757	68,74	37,560	4,41	852,187	4,86
2005	297,820	31,87	592,969	63,46	43,660	4,67	934,449	9,65
2006	327,690	31,08	681,120	64,61	45,406	4,31	1.054,216	12,82
2007	362,010	31,77	722,396	63,40	54,970	4,82	1.139,376	8,08
2008	364,039	28,62	815,174	64,09	92,727	7,29	1.271,940	11,63
2009	399,398	27,47	888,146	61,09	166,375	11,44	1.453,919	14,31
2010	382,890	27,91	833,132	60,72	156,069	11,37	1.372,091	-5,63
2011	501,466	34,55	905,593	62,40	62,378	4,30	1.469,437	5,77
2012	503,813	37,21	792,130	58,50	58,092	4,29	1.354,035	-6,70
2013	522,286	34,74	880,615	58,57	100,517	6,69	1.503,418	11,03
2014*	550,314	35,12	903,396	57,65	113,350	7,23	1.567,000	4,23

Source: ADA Santa Cruz y ADA Cochabamba, Elaboration: CAO-SIPREM

Sources

Estudio de Identificación, Mapeo y Análisis Competitivo de la Cadena Productiva Agrícola	Min. de Asuntos Campesinos y Agropecuarios	2003 dec
Censo Avícola Comercial 2011 en el departamento de Santa Cruz - Bolivia	Gob. Autónomo Departamental Santa Cruz	2011
Boletín Estadístico Anual – Gestión 2014	ADA Cochabamba	2015 mar
Estudio de Mercado del Pollo Parrillero 2013	AEMP	2013 sept

News sources

Censo Avícola 2016 registra crecimiento de 51,52% de aves en Santa Cruz	Notiboliviarural	2016 jun
Bolivians consuming more poultry products	Poultry World	2014 aug
Cochabamba y Santa Cruz, principales productores de pollo en Bolivia	WATTagnet	2015 feb
Poultry industry records growth in Bolivia and Paraguay	WATTagnet	2014 aug
Cobb produces broiler parent stock locally in Bolivia	Poultry World	2014 mar
Cae precio del pollo y los avícolas reportan pérdidas	Los Tiempos	2016 jul
Santa Cruz genera el 60% en producción de huevos	El Día	2015 oct
En Bolivia al año se consumen 1.591 MM de huevos	Eju!	2015 mar
El consumo de huevo alcanza a 150 unidades por persona al año	La Razón	2015 feb

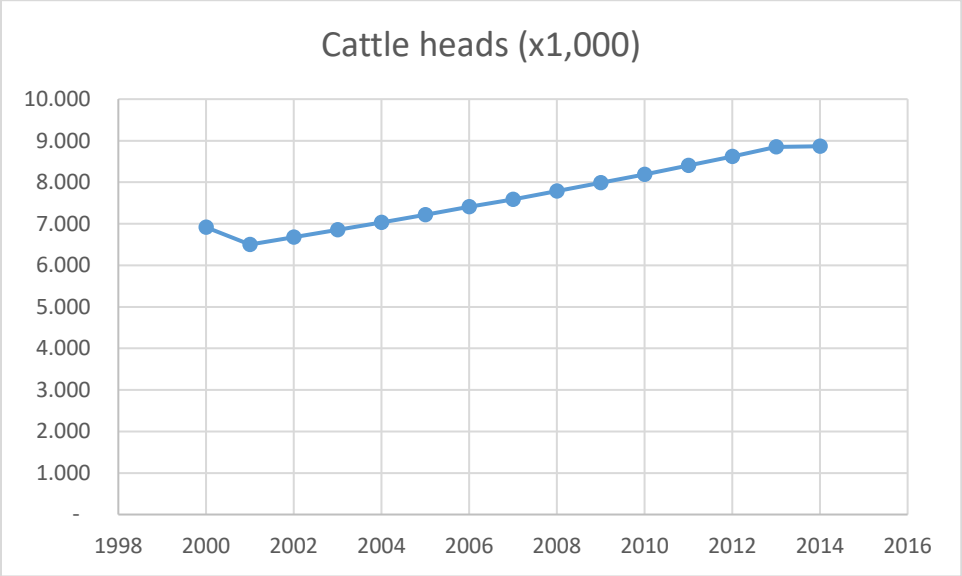
Annex XVIII: Livestock and beef

BOLIVIA: Number of cattle head per year and sex										
	2004	2005	2006	2007	2008	2009	2010	2011(p)	2012(p)	2013(p)
TOTAL	**7.033.582**	**7.217.507**	**7.409.00**	**7.586.526**	**7.786.802**	**7.985.230**	**8.189.78**	**8.400.43**	**8.620.78**	**8.847.434**
Bulls	2.456.370	2.484.850	2.512.646	2.529.036	2.550.745	3.103.665	3.244.152	3.350.836	3.443.550	3.543.530
Cows	4.577.212	4.732.657	4.896.356	5.057.490	5.236.057	4.881.565	4.945.634	5.049.603	5.177.234	5.303.904
< 1 year	**1.453.124**	**1.502.986**	**1.557.824**	**1.612.405**	**1.667.62**	**1.478.543**	**1.561.908**	**1.620.262**	**1.671.445**	**1.715.557**
Bulls	694.326	707.727	722.182	735.575	748.259	691.292	741.226	772.555	800.490	831.807
Cows	758.798	795.259	835.642	876.830	919.369	787.251	820.682	847.707	870.955	883.750
1-2 year	**2.142.024**	**2.248.88**	**2.357.457**	**2.462.36**	**2.580.118**	**2.368.507**	**2.108.179**	**2.074.734**	**2.103.004**	**2.168.706**
Bulls	881.312	865.743	842.580	811.738	777.051	1.092.943	995.704	991.246	1.010.252	1.045.765
Cows	1.260.712	1.383.142	1.514.877	1.650.628	1.803.067	1.275.564	1.112.475	1.083.488	1.092.752	1.122.941
> 2 years	**3.228.06**	**3.246.211**	**3.262.68**	**3.269.80**	**3.280.327**	**3.858.16**	**4.219.694**	**4.394.79**	**4.531.128**	**4.646.76**
Bulls	670.364	691.955	716.850	739.770	766.706	1.039.413	1.207.217	1.276.391	1.317.601	1.349.551
Cows	2.557.702	2.554.256	2.545.837	2.530.032	2.513.621	2.818.750	3.012.477	3.118.408	3.213.527	3.297.213
Steers	210.368	219.425	231.034	241.953	258.729	280.017	300.005	310.644	315.207	316.407

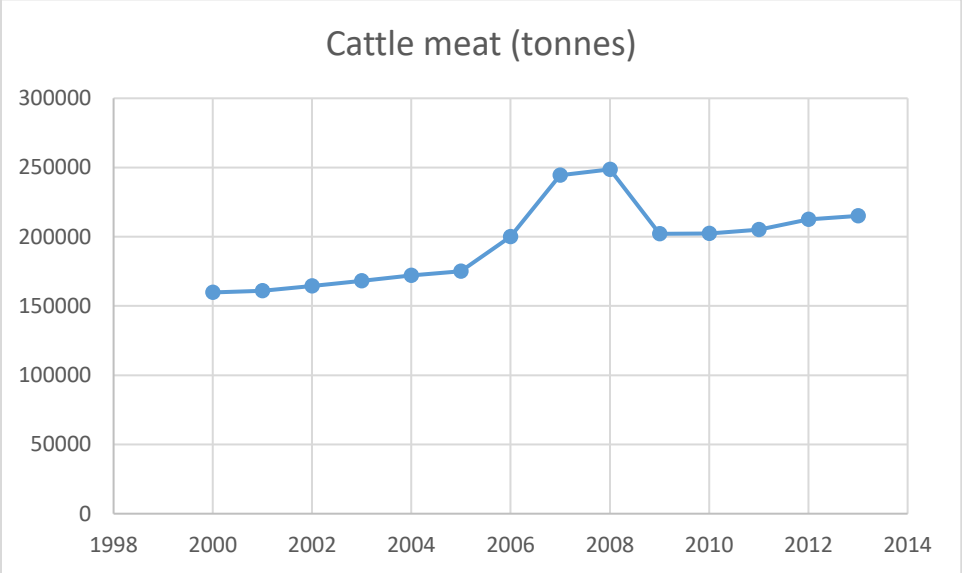
Source: INA, Elaboration: CAO-SIPREM, (p): Preliminary

BOLIVIA: Number of slaughtered cattle heads and production of meat												
	BOLIVIA		SANTA CRUZ		BENI		LA PAZ		CHUQUISACA		COCHABAMBA	
AÑO	BEEF	HEADS	BEEF	HEADS	BEEF	HEADS	BEEF	HEADS	BEEF	HEADS	BEEF	HEADS
2000	**152.195**	**870.693**	80.743	461.269	17.796	111.222	17.376	100.253	13.173	73.257	9.515	51.934
2001	**146.996**	**841.057**	78.425	448.873	16.327	102.043	17.352	99.957	11.800	65.909	8.779	48.269
2002	**154.162**	**875.554**	82.285	467.325	16.861	105.382	18.302	103.767	12.221	68.225	9.423	51.504
2003	**157.052**	**890.186**	83.669	473.837	17.137	107.104	18.532	106.268	12.526	69.294	9.871	52.838
2004	**161.730**	**918.444**	86.381	490.025	17.600	110.001	19.334	109.718	12.778	71.371	10.104	54.582
2005	**175.657**	**917.233**	92.303	475.787	17.633	113.035	22.144	114.196	12.708	69.916	13.281	59.027
2006	**182.221**	**947.297**	96.248	493.580	18.414	116.541	22.570	116.094	12.944	71.293	13.775	61.773
2007	**183.982**	**960.210**	97.490	502.525	18.569	118.273	23.153	119.225	12.297	68.696	14.024	62.886
2008	**191.740**	**984.654**	103.401	524.880	19.262	120.389	23.492	121.095	12.163	65.560	14.474	64.617
2009	**202.026**	**1.016.936**	107.461	540.006	21.238	124.201	24.412	125.837	13.679	69.793	14.862	66.348
2010	**202.347**	**1.048.171**	108.953	558.734	21.323	126.924	24.850	128.426	13.223	71.477	14.939	68.213
2011	**205.187**	**1.064.038**	108.790	557.899	22.660	134.880	25.455	131.891	13.543	73.206	15.314	69.926
2012	**215.102**	**1.109.438**	115.841	592.321	22.779	134.786	26.230	135.305	14.129	75.049	15.859	71.734
2013	**221.739**	**1.129.758**	119.537	600.866	22.697	134.832	29.596	143.685	15.160	76.933	15.612	75.268

Source: INE and MDRyT - "Producción de carne y derivados de las principales especies ganaderas a nivel nacional 1990-2013"



Source: FAO



Source: FAO

Sources and news sources

Ganadería Bovina en Bolivia y Santa Cruz – situación al 2013	Fegasacruz	2013 mar
Producción de Ganado Bovino en Bolivia	Fegasacruz	2012 nov
The Politics of Livestock Sector Policy and the Rural Poor in Boliva	Pro-Poor Livestock Policy Initiative	2004 jul
Silos de autoconsumo, técnica adoptada por criadores de cebú en Bolivia	Notiboliviarural	2016 may
En Bolivia existen 500 mil bovinos de la raza criolla	Notiboliviarural	2015 apr
ABT dispuesta a buscar alternativas de reforestación para no afectar producción ganadera	Cámara Forestal de Bolivia	2015 dec
Nelore ocupa el 42% de la ganadería cruceña	El Día	2015 aug
La producción de carne de res aumentó este año en 18.000 t	La Razón	2014 dec
Ganaderos de Beni y Santa Cruz mueven unos $us 510 MM al año	La Razón	2013 may

Annex XIV: Dairy

DEPARTMENT	PRODUCERS	% DE PRODUCERS	DAILY PRODUCTION	SHARE IN NATIONAL PRODUCTION
LA PAZ	6.820	49%	195.000	13%
COCHABAMBA	3.758	27%	510.000	34%
SANTA CRUZ	1.809	13%	750.000	50%
OTHER DEPART.	1.531	11%	45.000	3%
TOTALS	**13.919**	**100%**	**1.500.000**	**100%**

Source: cao

Number of milk cows and production per day – per department			
Department	Total number of milked cows	Production (liters/day)	Average (liters/day/cow)
BOLIVIA	**382,561**	**2,255,932**	**5.9**
Chuquisaca	11,601	34,656	3.0
La Paz	65,229	276,731	4.2
Cochabamba	36,611	370,155	10.1
Oruro	12,200	62,986	5.2
Potosí	1,305	5,290	4.1
Tarija	9,636	76,113	7.9
Santa Cruz	204,429	1,322,610	6.5
Beni	40,003	102,387	2.6
Pando	1,547	5,004	3.2

Source: INE – CENSO AGROPECUARIO 2013

SANTA CRUZ: Estimation of milk production and costs			
Farm id.	**Production Litres/day**	**Average Cow/day**	**Prod. Cost (USD)**
1	350	10,00	0,282
2	60	7,50	0,280
3	507	16,90	0,172
4	170	6,80	0,182
5	55	3,66	0,308
6	470	11,70	0,172
7	500	16,60	0,150
8	400	10,00	0,167
9	640	8,00	0,145
10	110	11,00	0,178
11	750	11,50	0,280
12	120	13,00	0,280
13	280	7,00	0,300
14	555	10,00	0,214
15	124	12,40	0,206
16	250	10,80	0,136
17	230	11,00	0,125
18	300	6,00	0,182
19	610	7,00	0,227
20	10	2,00	0,228
21	15	2,00	0,185
22	24	3,00	0,287
Average	**296,82**	**8,99**	**0,21**

Source: FEDEPLE, Elaboration: CAO-SIPREM

Sources

Producción lechera y efectos del cambio climático en dos comunidades del Altiplano Norte	CIPCA	2014 dec
Caracterización del Sector Lechero en Bolivia	Senasag	2012 jan
Competitividad Económica-Ambiental para la Cadena de Lácteos de Bolivia	Instituto de Estudios Sociales y Económicos (IESE)	2007

News sources

La producción de leche crece 90.000 litros diarios en el eje	Bolivia Emprende	2014 dec
Sobrante anual en producción de leche llega a 81 MM de litros	La Razon	2016 feb
Perú, el Principal Destino de Exportación de la Leche en Polvo Boliviana que Crece cada vez más	PeruLactea	2014 jul
El consumo de leche en Bolivia se duplica en el periodo 2008-2014	La Razon	2015 oct
Sector lácteo busca institucionalizar Encuentro Nacional de la Leche	Bolivia.com	2014 oct
El conflicto lechero se agrava	Pagina Siete	2016 apr
El precio externo de la leche no cubre ni 50% de los costos de PIL	La Razon	2016 mar
Productores ganaderos de San Javier crearán la primera Cooperativa Lechera	Notiboliviarural.com	2016 mar
Gobierno implementa programa 'Un vaso de leche al día por niño' en 15 municipios de Pando	ProBolivia	2014 aug

Annex XX: Pigs

BOLIVIA: Number of pig heads per year and sex										
	2004	2005	2006	2007	2008	2009	2010	2011	2012(p)	2013(p)
TOTAL	**2.083.698**	**2.179.884**	**2.279.625**	**2.384.934**	**2.502.007**	**2.569.864**	**2.640.616**	**2.712.800**	**2.787.973**	**2.863.928**
Boar	911,819	947,668	984,371	1.022.938	1.065.946	1.093.119	1.112.488	1.141.635	1.178.598	1.206.173
Gilt/Sow	1.171.879	1.232.215	1.295.254	1.361.996	1.436.061	1.476.745	1.528.128	1.571.165	1.609.375	1.657.755
<8 months	**1.390.069**	**1.429.398**	**1.468.771**	**1.509.362**	**1.554.877**	**1.578.779**	**1.609.031**	**1.682.611**	**1.751.897**	**1.750.571**
Boar	631,726	643,575	654,8	665,994	678,523	683,213	692,812	730,731	775,456	757,614
Gilt	758,343	785,823	813,971	843,368	876,354	895,566	916,218	951,88	976,441	992,957
>8 months	**693,629**	**750,486**	**810,854**	**875,572**	**947,13**	**991,085**	**1.031.585**	**1.030.190**	**1.036.076**	**1.113.357**
Boar	280,093	304,094	329,571	356,944	387,423	409,906	419,676	410,904	403,142	448,559
Sow	413,536	446,392	481,283	518,628	559,707	581,179	611,909	619,286	632,934	664,798

Source: INE, Elaboration: CAO-SIPREM, (p): Preliminary

BOLIVIA: Production of pork meat (in tonnes)										
Year	**Bolivia**	Santa Cruz	Chuquisaca	La Paz	Tarija	Cochabamba	Beni	Potosí	Pando	Oruro
2000	**64.502**	20.044	12.784	8.646	7.687	4.993	5.336	2.960	1413	639
2001	**66.231**	21.212	13.362	8.675	7.680	5.275	5.387	3.128	849	663
2002	**67.825**	22.314	13.850	8.657	7.515	5.268	5.467	3.251	851	652
2003	**69.814**	23.642	14.263	8.930	7.300	5.538	5.382	3.298	830	631
2004	**71.214**	25.077	14.096	8.929	7.201	5.839	5.307	3.364	799	602
2005	**72.828**	26.613	14.121	9.196	7.059	5.840	5.216	3.422	776	585
2006	**74.679**	28.233	13.940	9.439	6.976	6.161	5.132	3.478	752	568
2007	**76.439**	29.941	13.742	9.462	6.932	6.522	5.030	3.532	728	550
2008	**77.592**	31.159	13.562	9.504	6.835	6.697	5.011	3.600	712	512
2009	**80.464**	32.298	13.998	9.964	7.292	6.694	5.257	3.643	767	551
2010	**83.881**	33.488	14.453	10.453	7.791	6.869	5.524	3.882	827	594
2011	**86.737**	34.778	15.137	10.724	7.957	7.083	5.615	3.985	852	606
2012	**89.625**	35.782	15.705	11.072	8.256	7.366	5.790	4.100	879	675
2013	**90.599**	36.599	15.850	10.916	8.315	7.532	5.756	4.098	861	673

Source: INE and MDRyT - "Producción de carne y derivados de las principales especies ganaderas a nivel nacional 1990-2013"

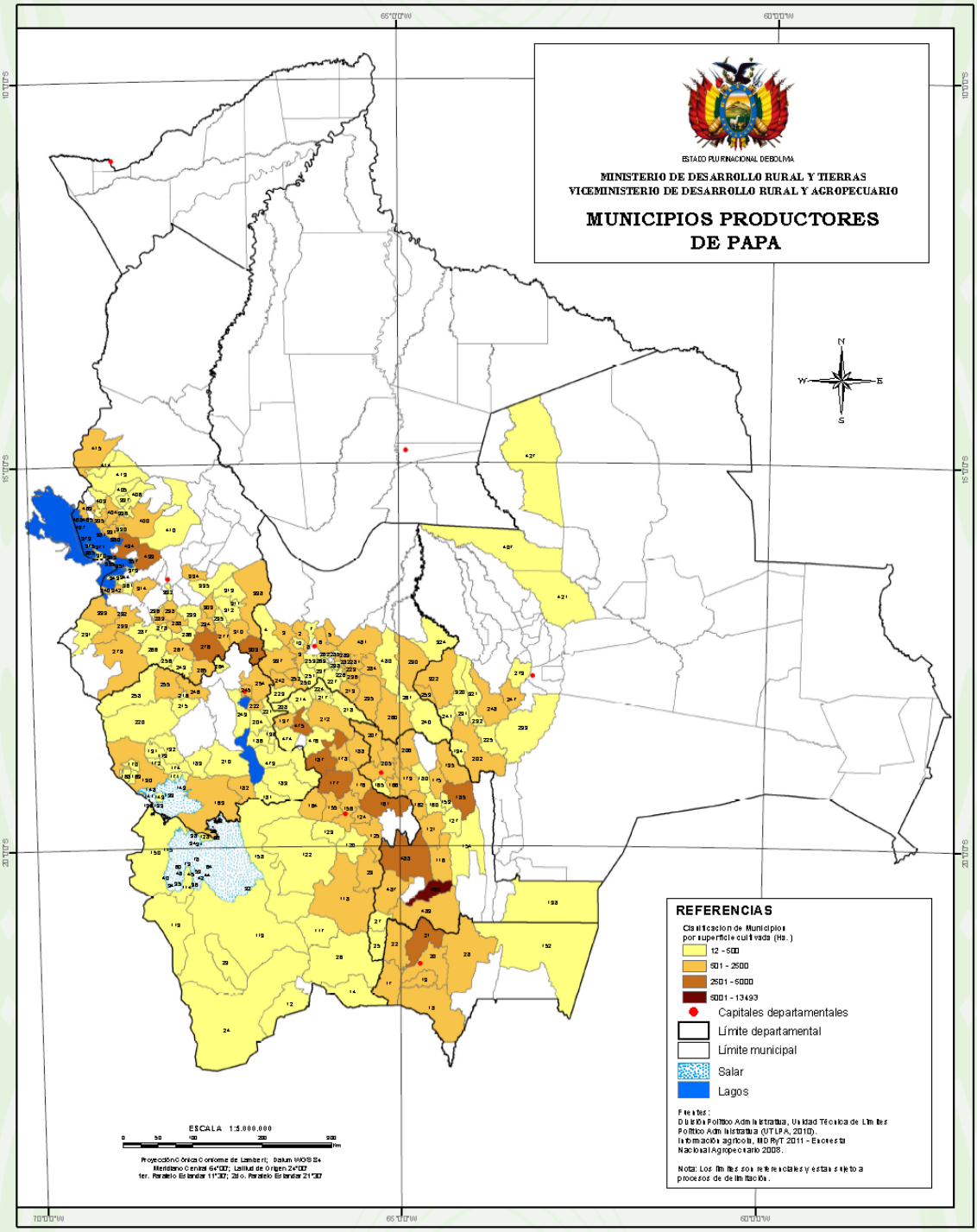
Sources and news sources

Porcicultores temen competencia estatal	El Sitio Porcino	2016 apr
La producción porcina en Santa Cruz crece un 13%	El Día	2015 mar
Cerdos de exportación	El Día	2015 dec
Topigs exports genetics to Bolivia	Pig Progress	2013 mar

Annex XXI: Productive maps

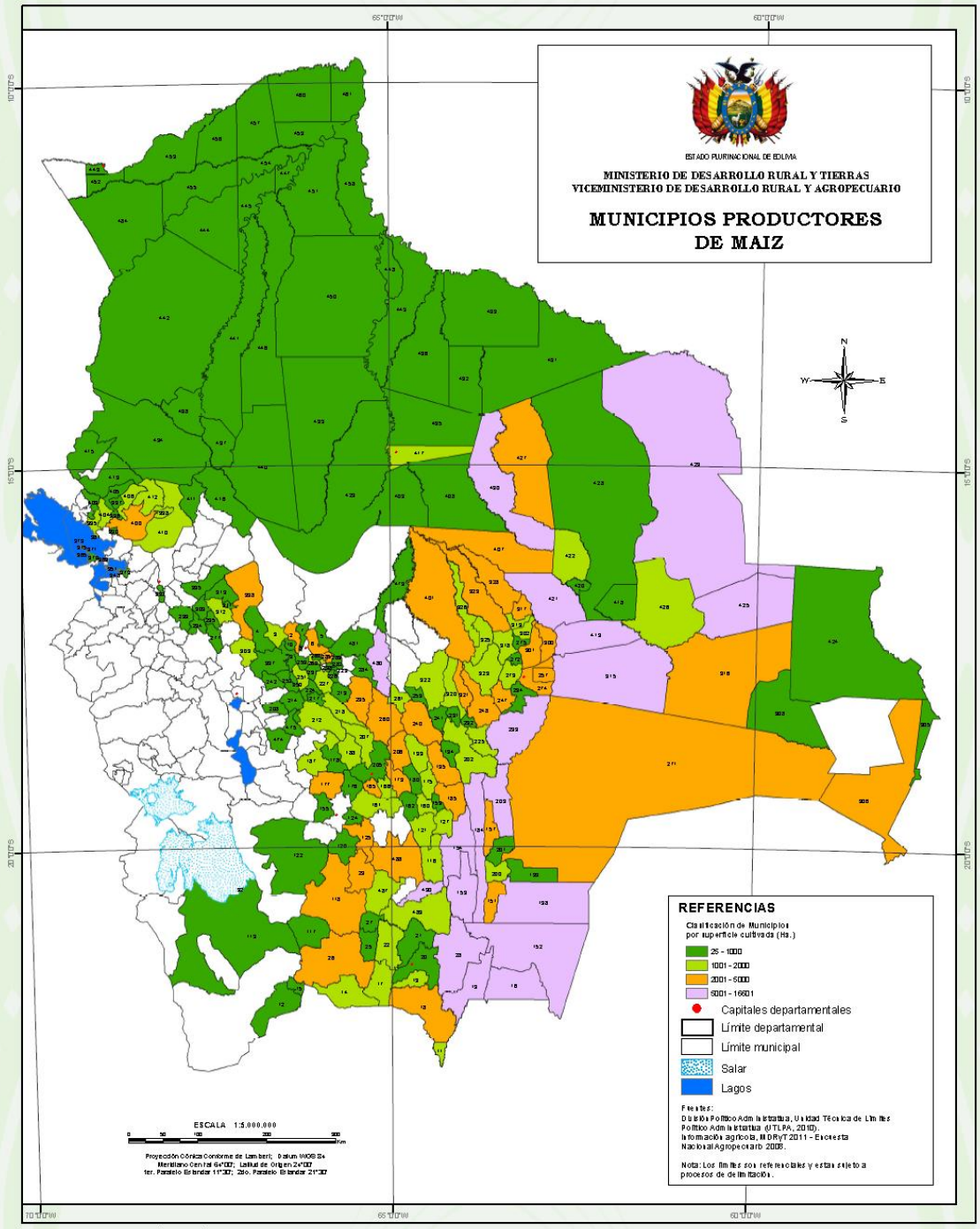
NB: The indicated regional production in the following graphs may deviate from the actual production

MAPA 3.1 Municipios productores de papa



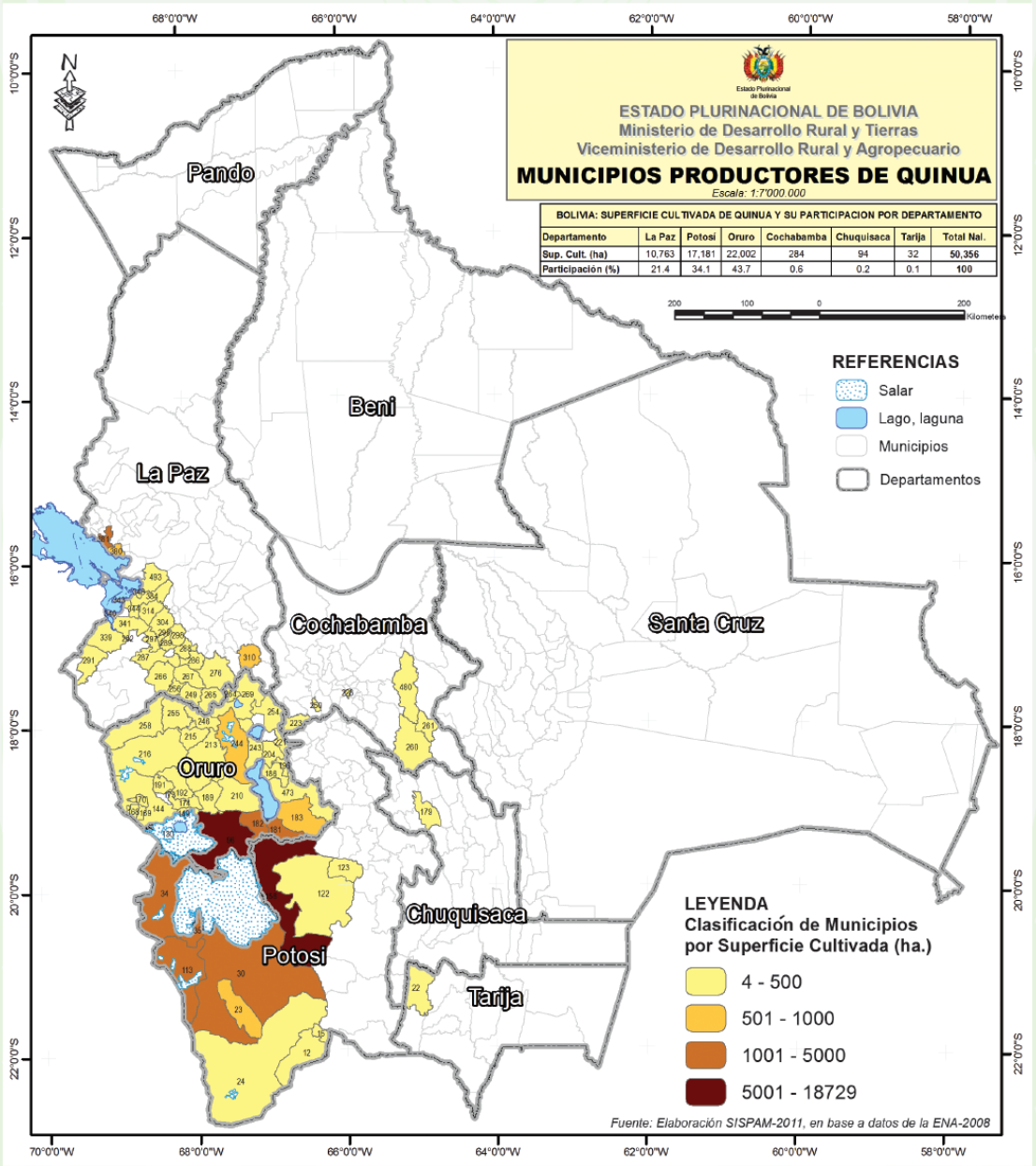
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.2 Municipios productores de maíz



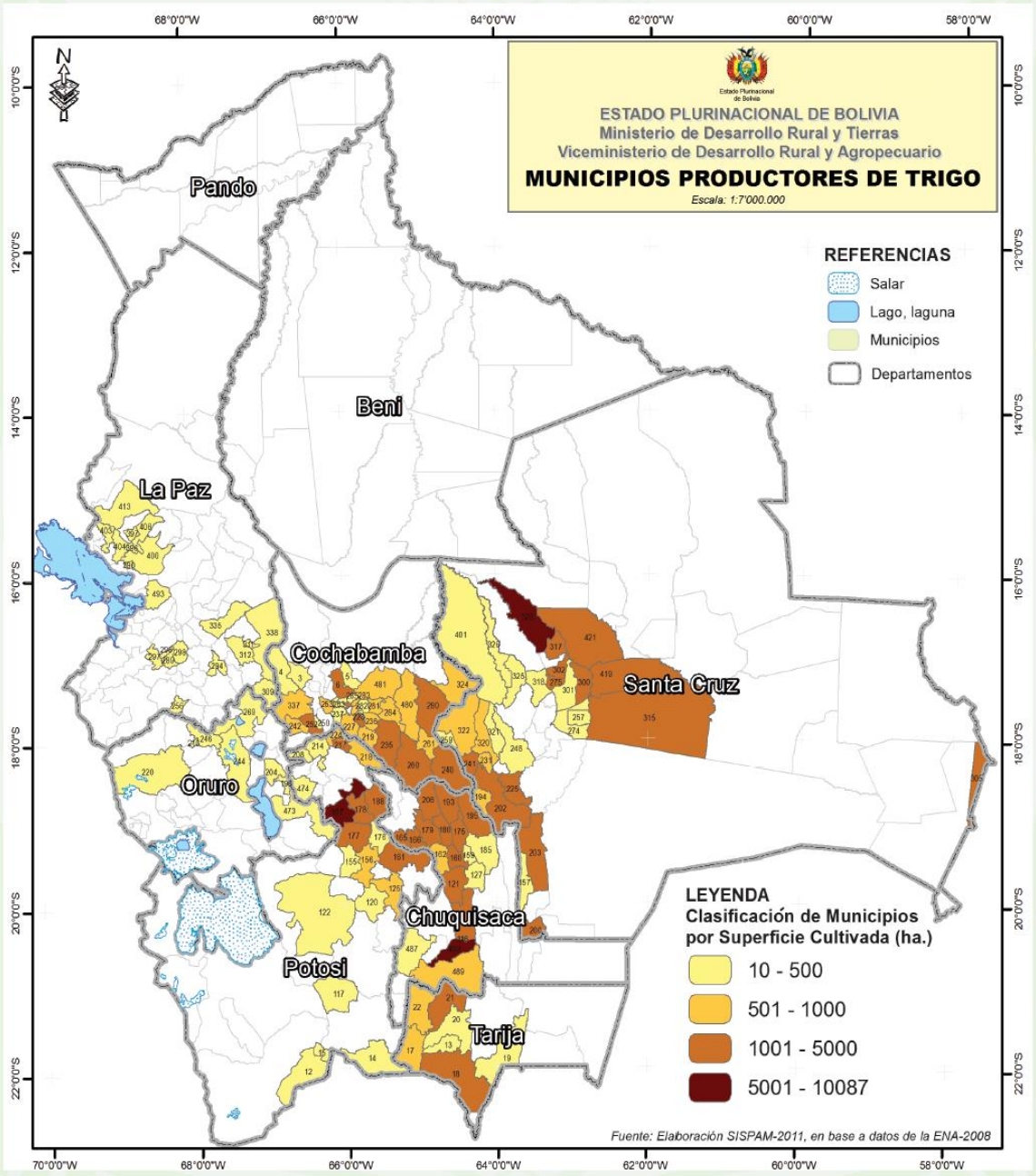
Fuente: MDRyT; SISPAM con base en datos ENA-2008.

MAPA 3.3 Municipios productores de quinua



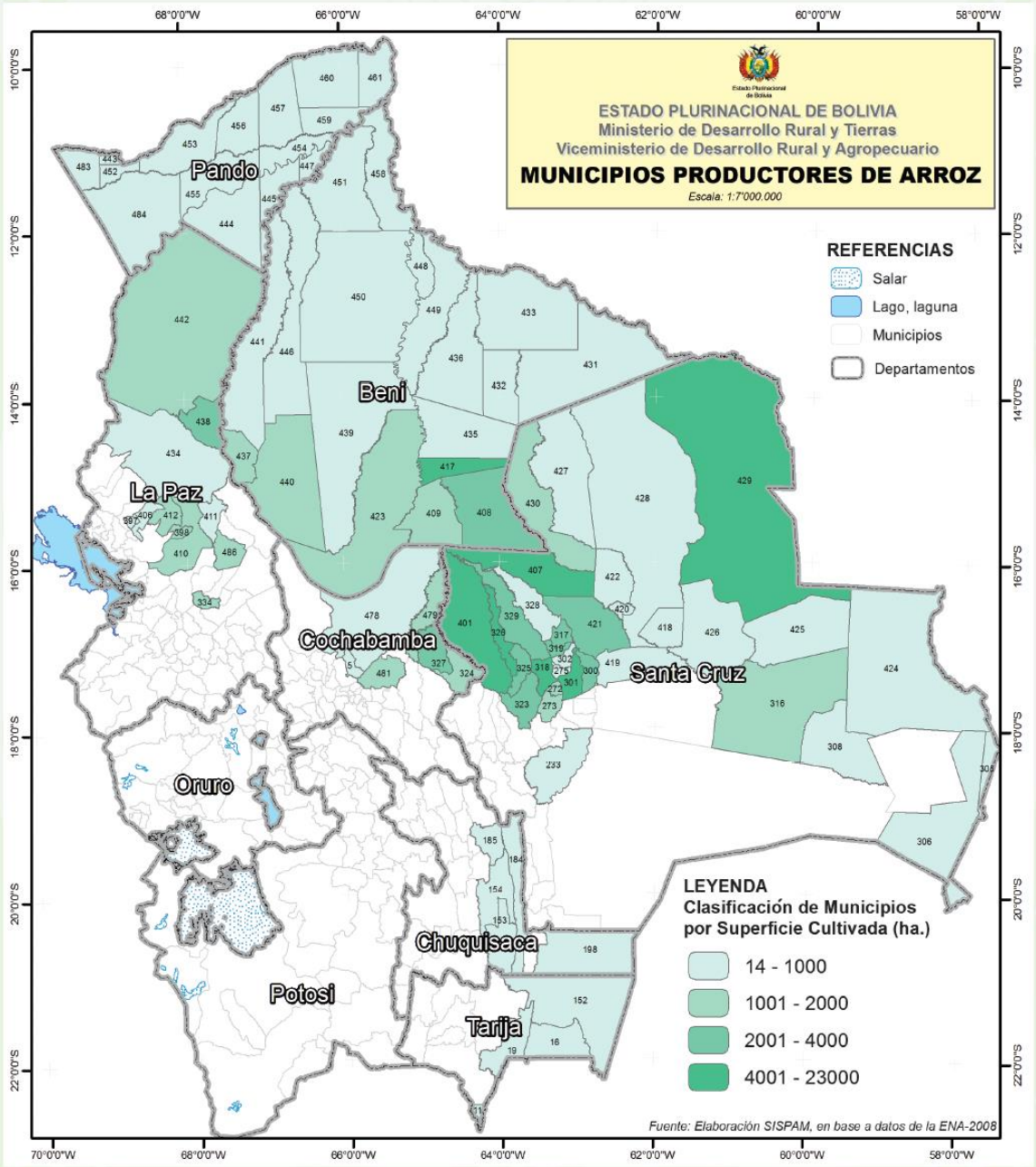
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.4 Municipios productores de trigo



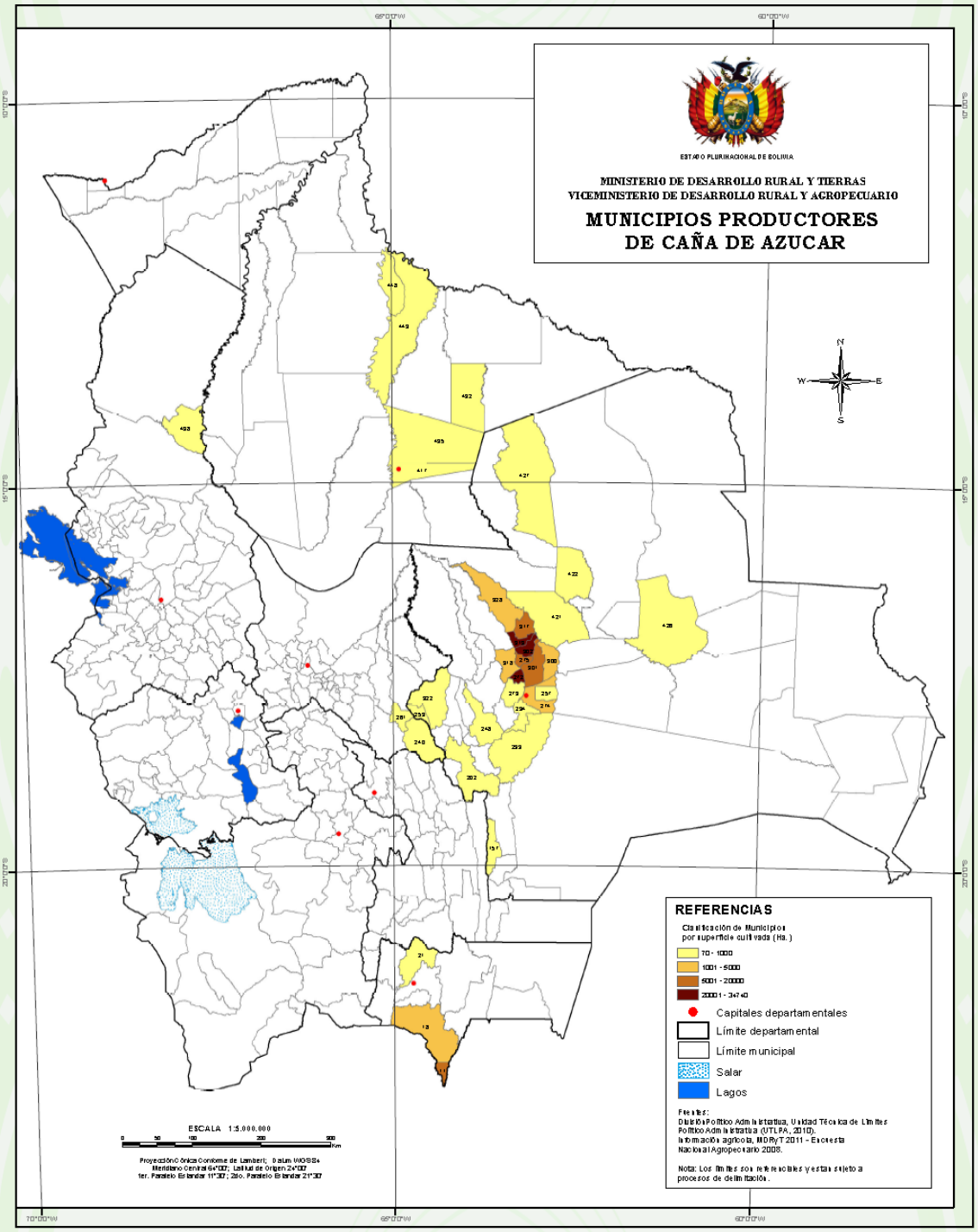
fuente: MDRyT; SISPAM, 2011 con base en datos ENA - 2008.

MAPA 3.5 Municipios productores de arroz



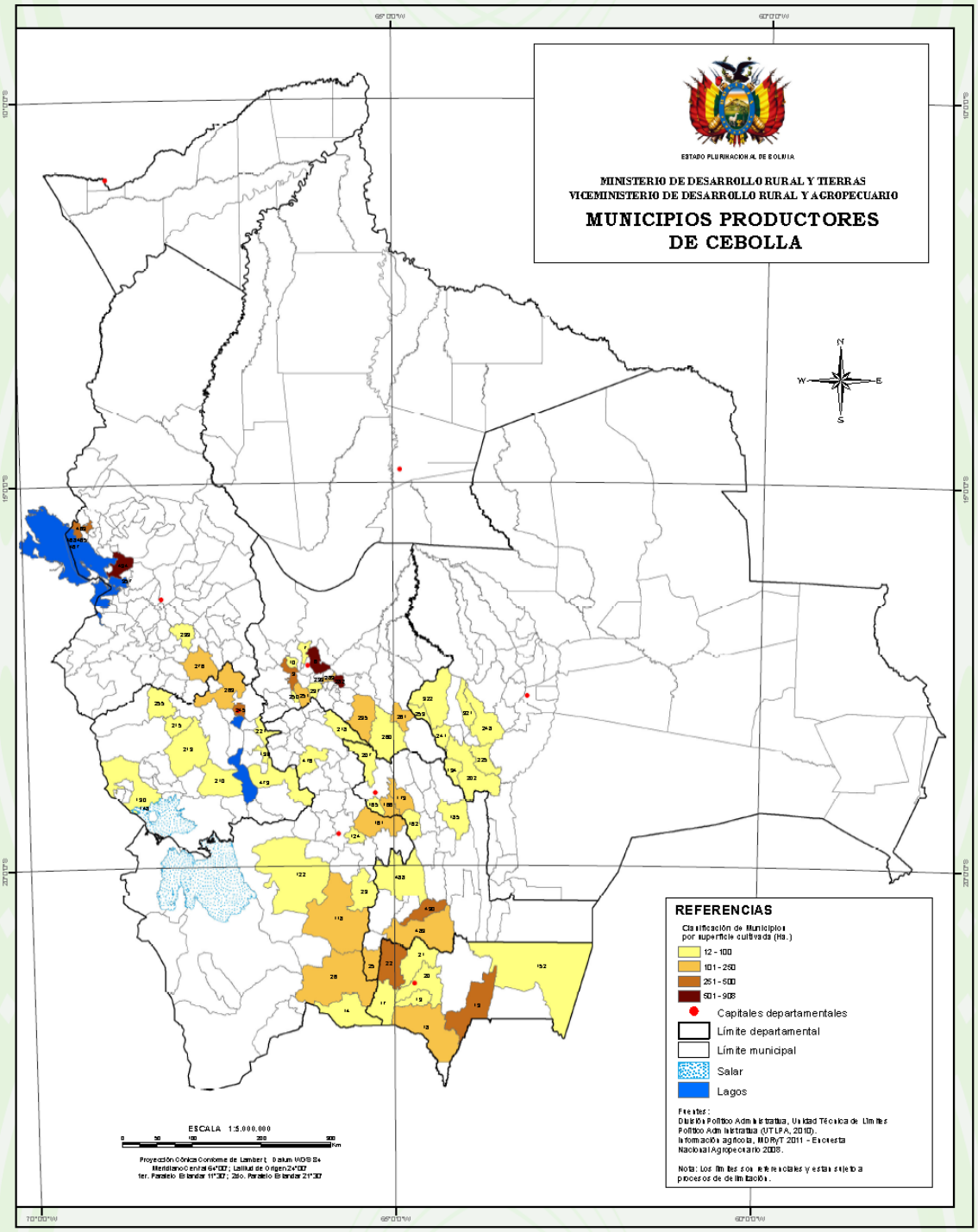
Fuente: MDRyT, SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.6 Municipios productores de caña de azúcar



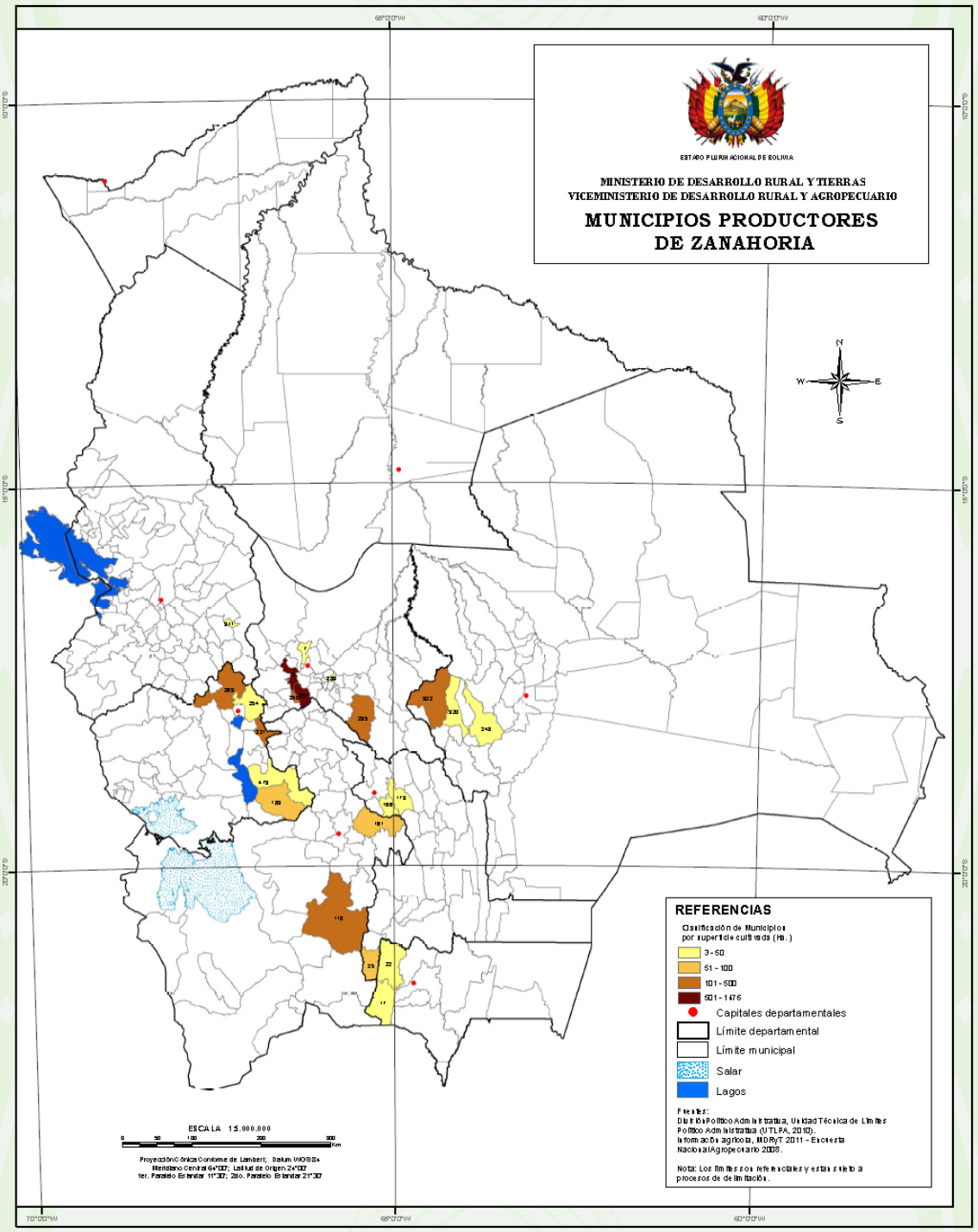
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.7 Municipios productores de cebolla



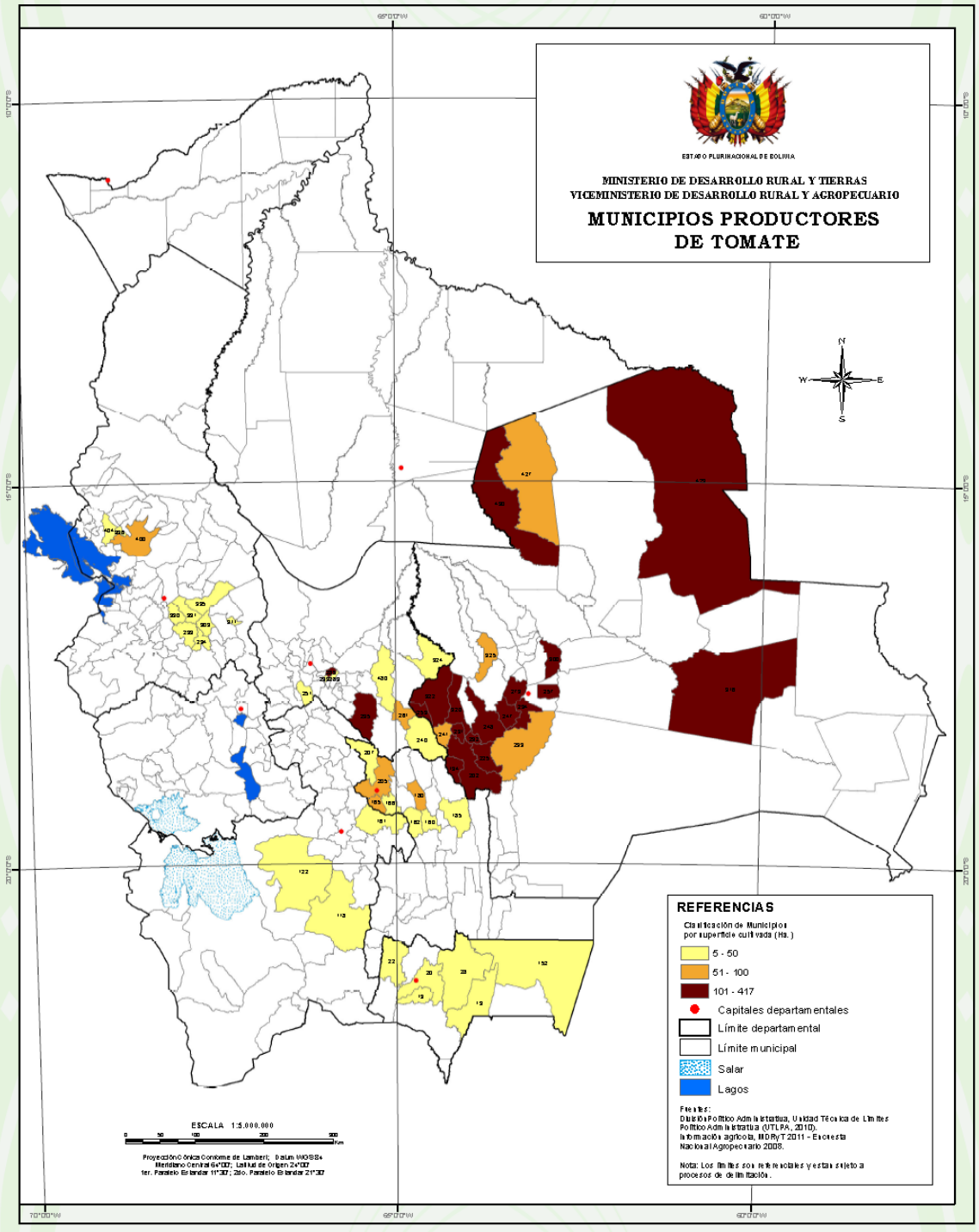
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.8 Municipios productores de zanahoria



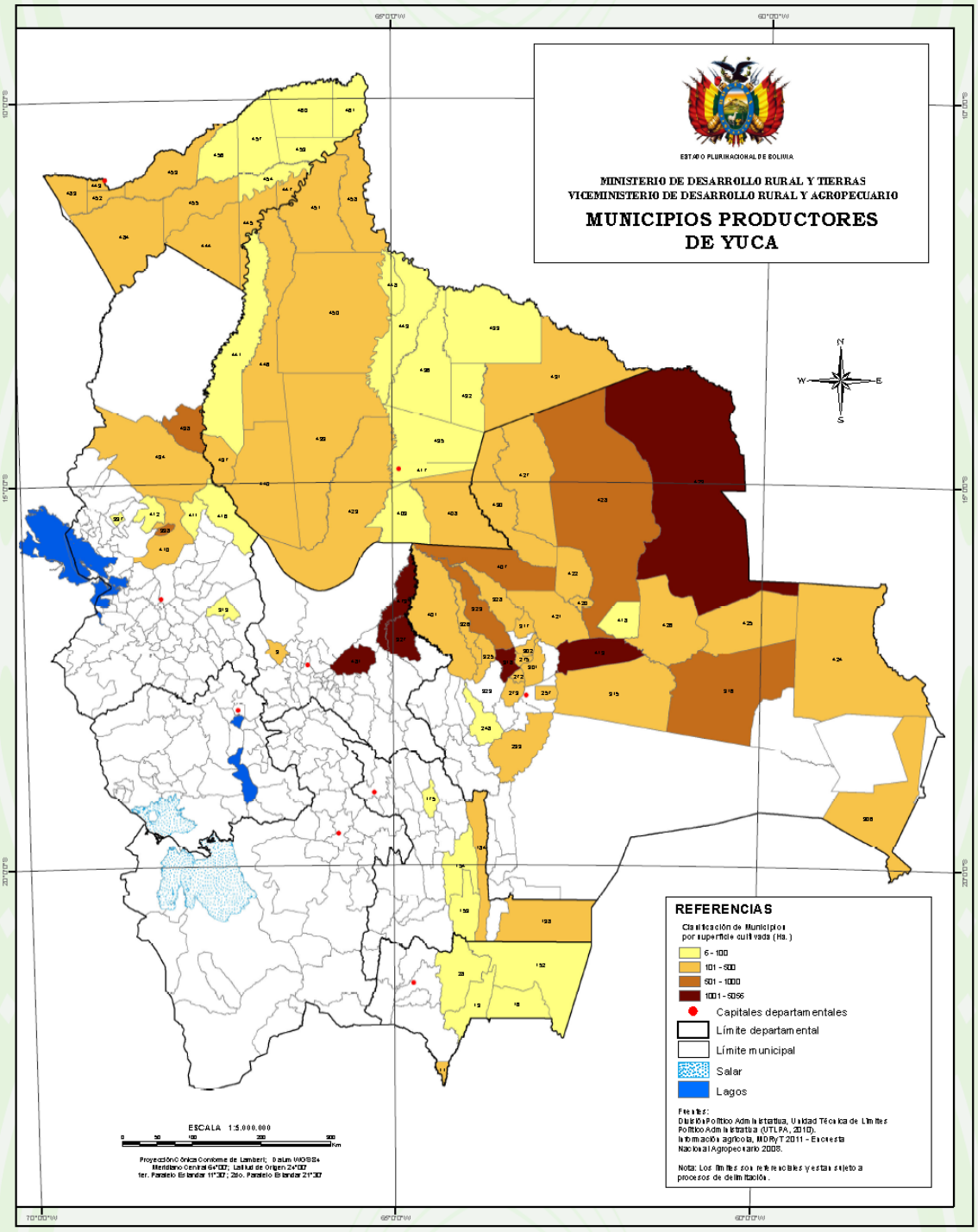
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.9 Municipios productores de tomate



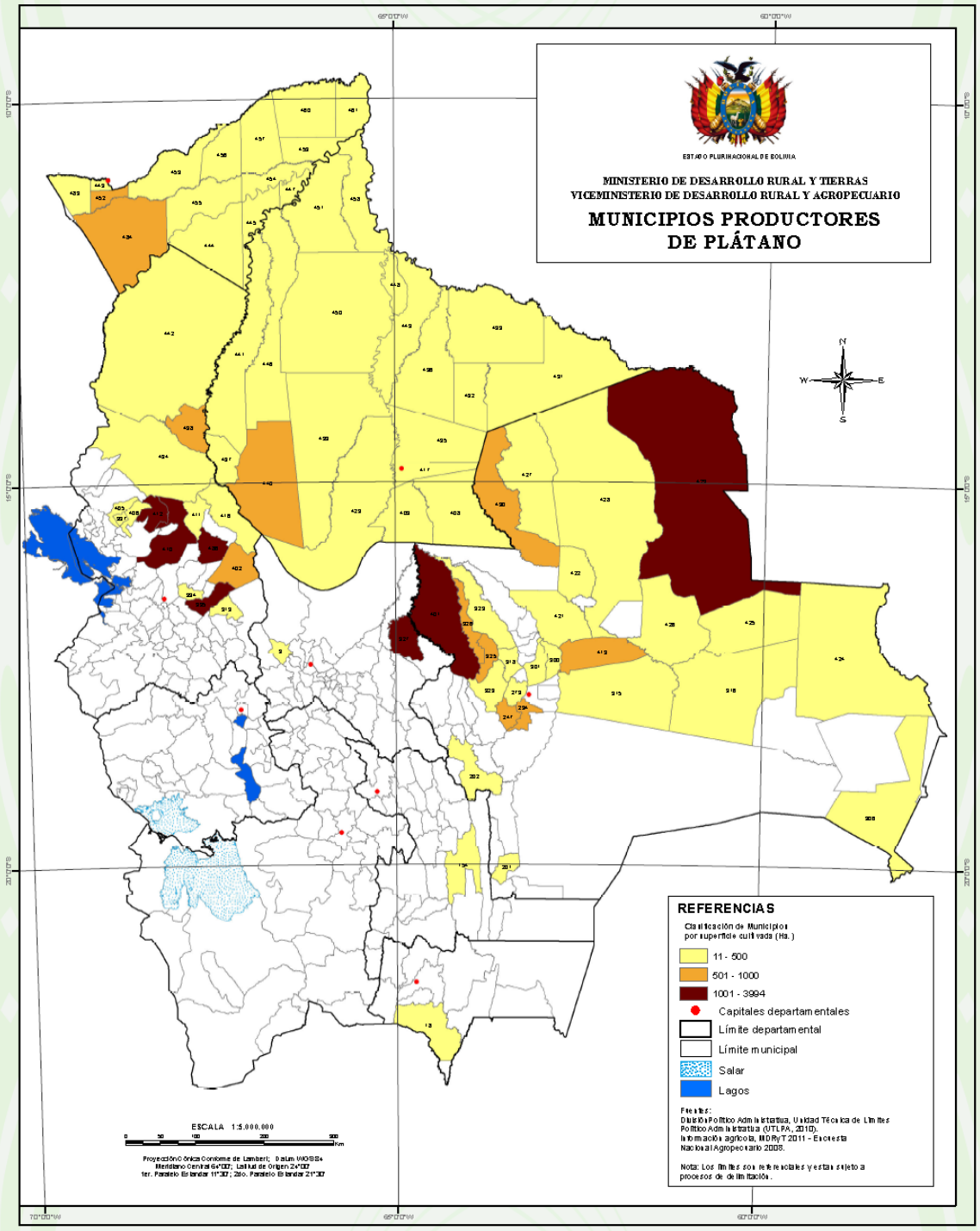
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.10 Municipios productores de yuca



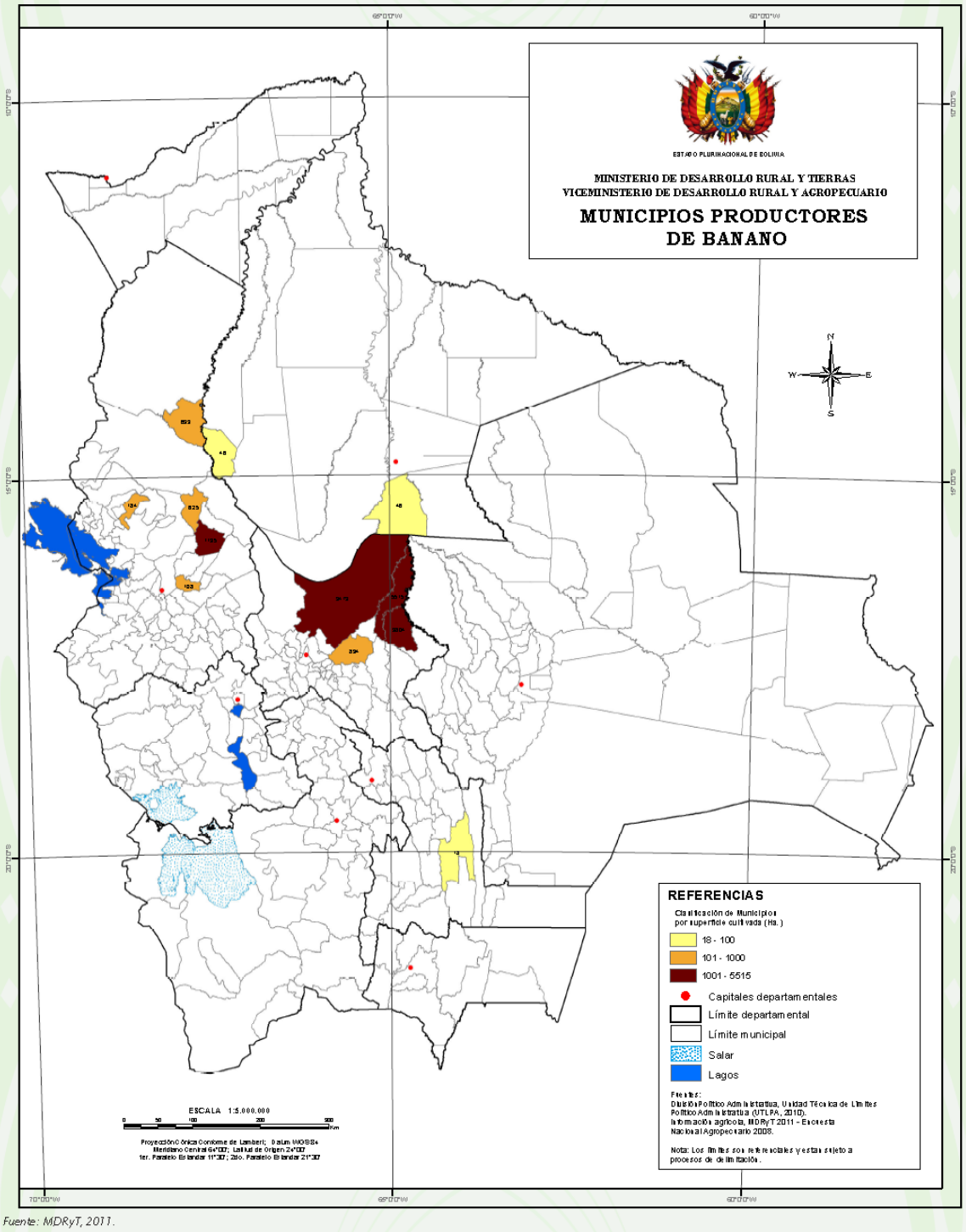
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.11 Municipios productores de plátano



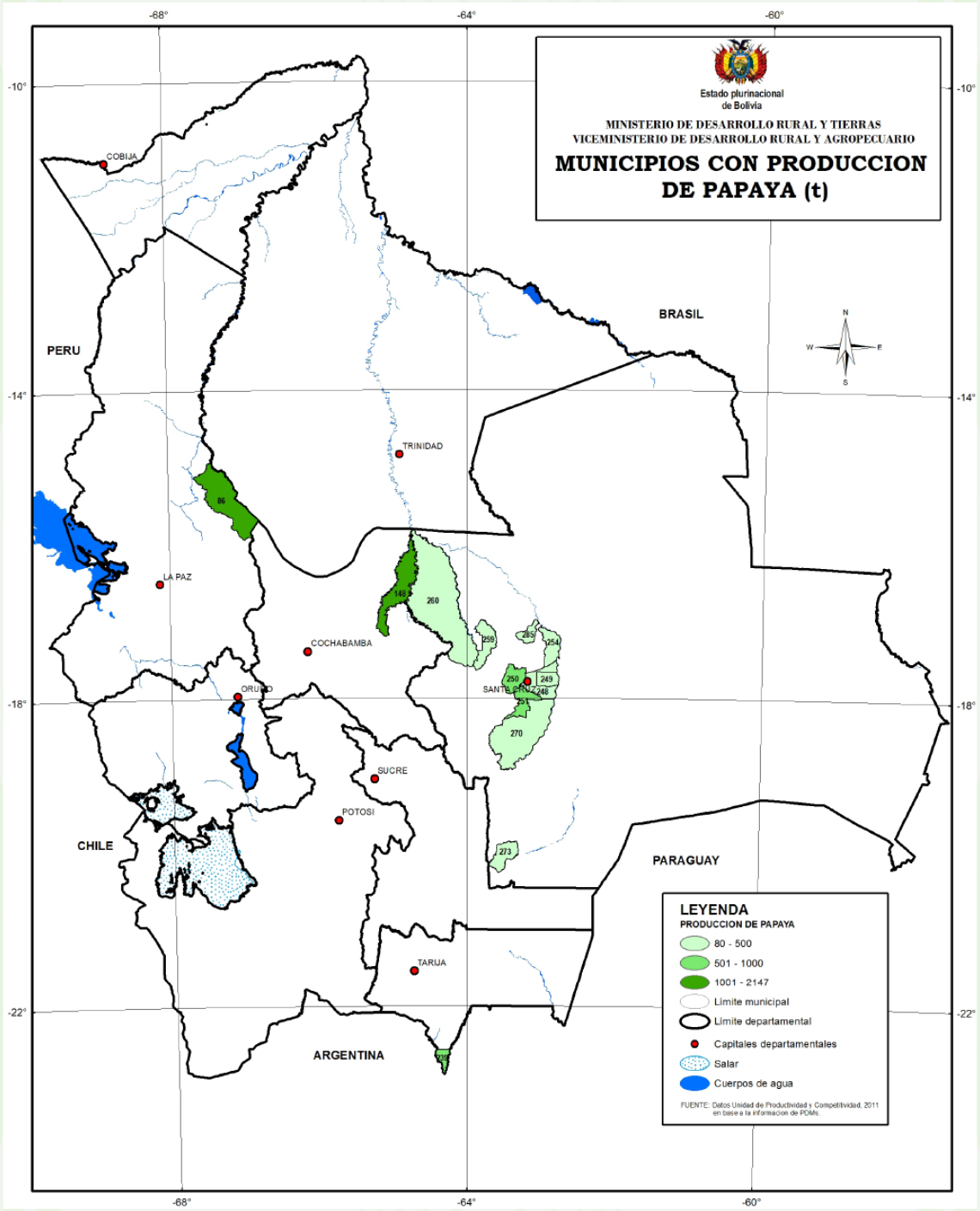
Fuente: MDRyT; SISPAM, 2011 con base en datos ENA-2008.

MAPA 3.12 Municipios productores de banano



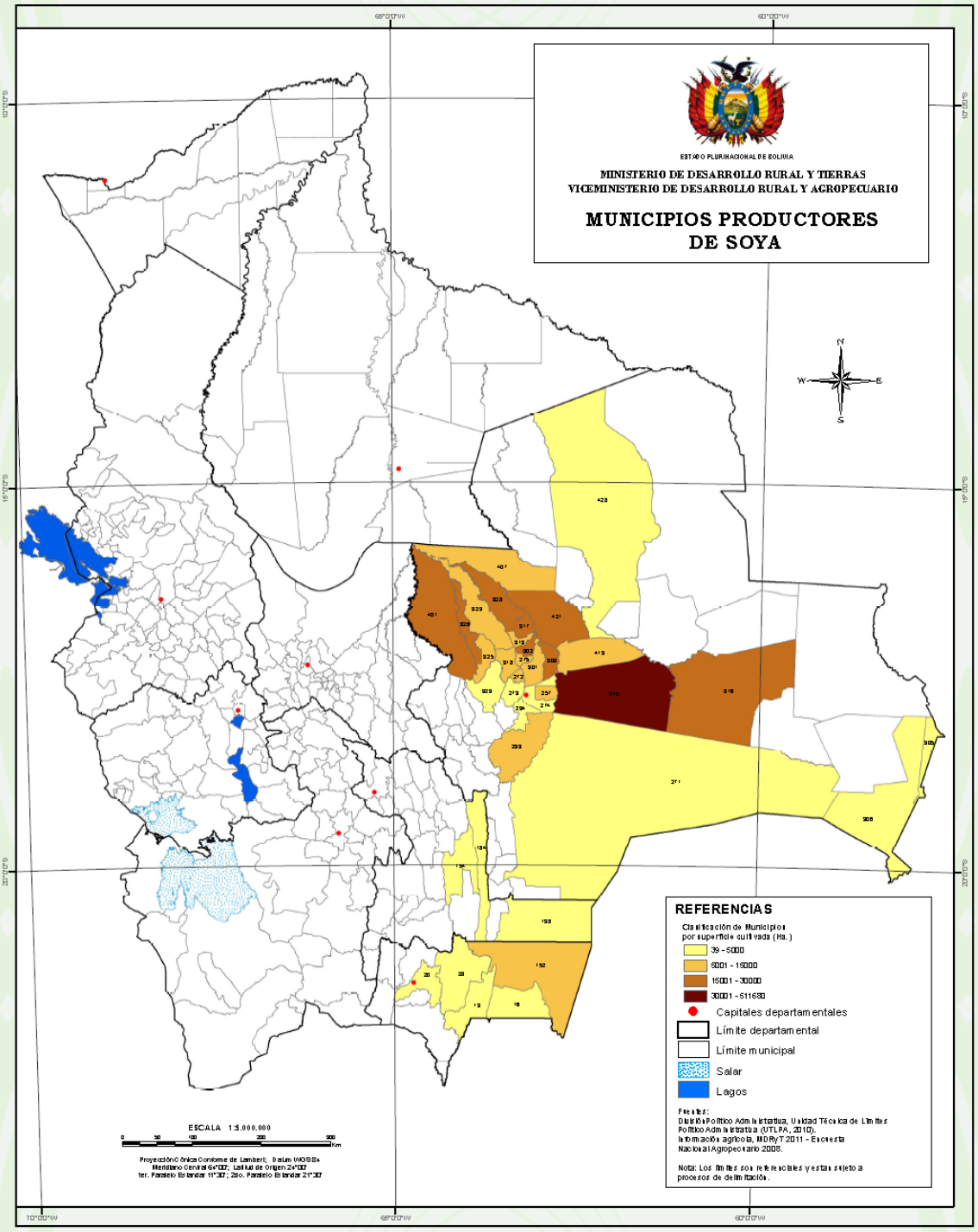
Fuente: MDRyT, 2011.

MAPA 3.13 Municipios productores de papaya



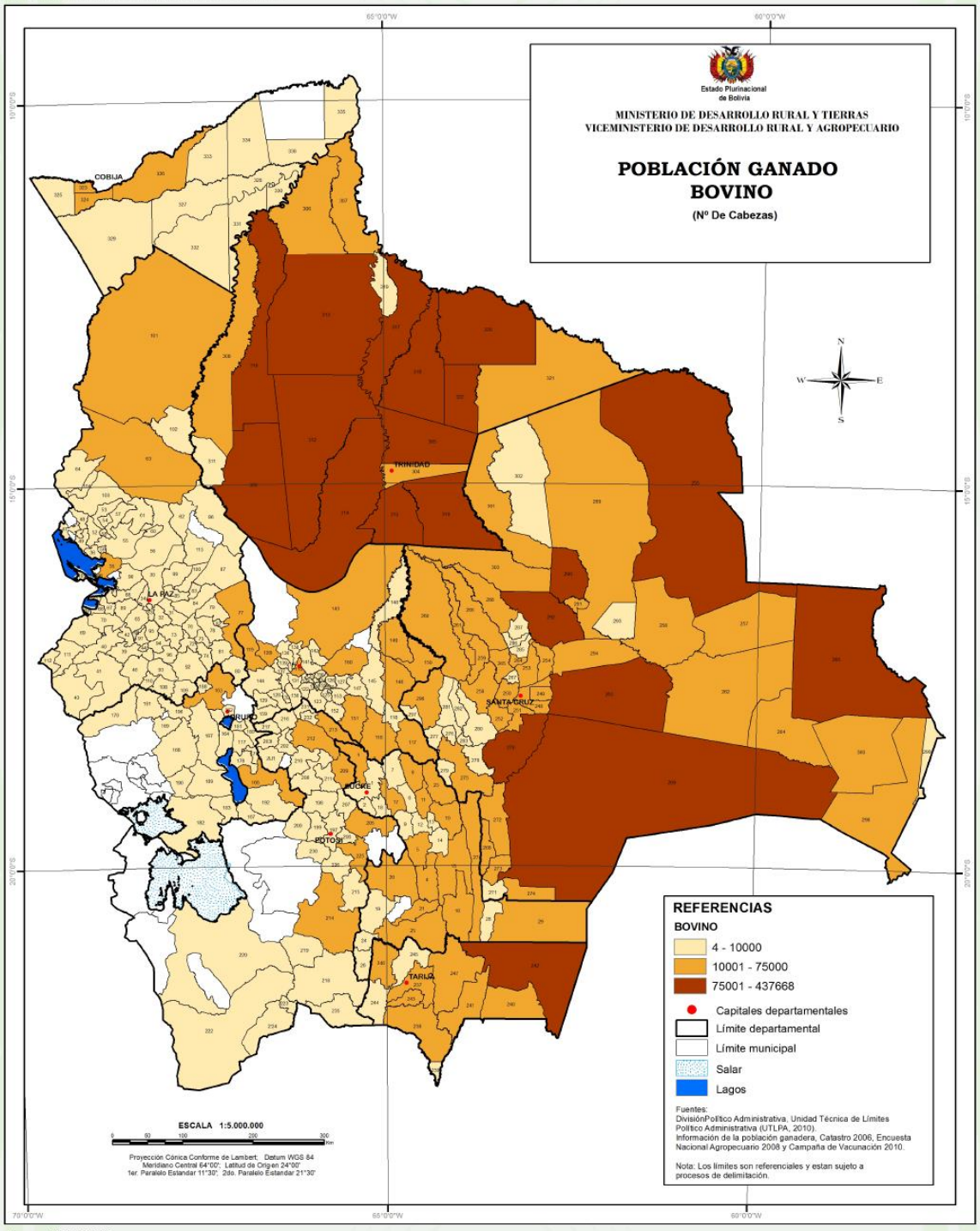
Fuente: MDRyT, 2011.

MAPA 3.14 Municipios productores de Soya



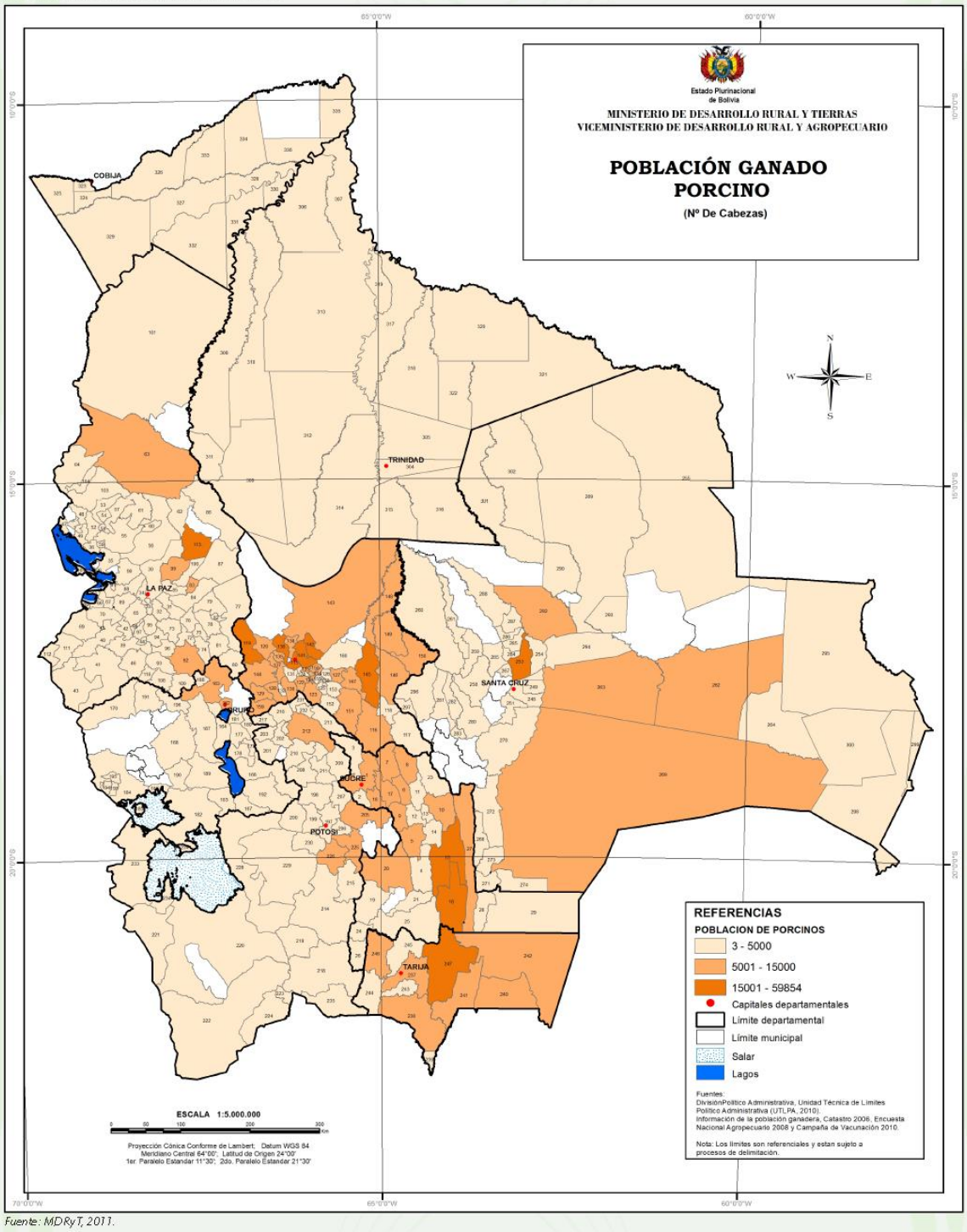
Fuente: MDRyT, 2011.

MAPA 3.16 Población del ganado bovino de carne



Fuente: MDRyT, 2011.

MAPA 3.18 Municipios con población de porcinos



Fuente: MDRyT, 2011.

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