

# Improving rural livelihoods through promoting high-quality coffee and coffee cherry products: Evidence from Bolivia and Colombia

- Coffee provides a livelihood to millions of smallholder farmers, but faces a severe crisis due to low prices, climate change and plant diseases.
- Specialty coffee markets reward quality and can increase farm gate prices.
- In producing countries like Colombia and Bolivia, specialty coffee is typically exported, and lower-quality coffee is marketed for domestic consumption. However, local demand for high-quality coffee is growing, and coffee cherry products are increasingly sought after.
- Climate change will severely affect most *Arabica* coffee areas. Coffee under shade trees in forested landscapes, climate-friendly management and post-harvest technologies will allow for an adapted and resilient coffee production that can also fulfil the highest quality criteria.
- Strengthening high quality and sustainable coffee requires stronger commitments from governments and the private sector. Support needs to take into account the whole value chain, from production to consumption.

## Research on high-quality coffee in Colombia and Bolivia

We investigated three topics in the two origin countries Bolivia and Colombia:

- 1) The potential of high-quality green coffee and coffee cherry value chains for farmers' livelihoods
- 2) The most important quality traits for green coffee and coffee cherry products in Colombia and in Bolivia
- 3) Concrete implementations and necessary policy reorientations at national and international levels to enhance markets (local as well as export) for high quality green coffee and coffee cherry products

## Specialty coffee value chains and livelihoods

**Colombia** has had a coffee-growing tradition for centuries, where organizations and markets are well established and institutionalized. The country is internationally known for its high-quality coffees. However, with family farming in crisis, coffee commercialization is currently being re-invented. In **Bolivia**, one of the poorest countries in South America, production has been decreasing in the last five years despite increasing international recognition and highly sought-after coffees, (World Bank 2019, FAO 2018). However, especially in Bolivia's larger cities, the awareness for high-quality coffee is growing and a new coffee culture is emerging.

Bolivia also has a long tradition of coffee cherry tea known as "Sultana".

**We identified in both countries a positive relationship between the involvements of farmers in high-quality coffee value chains and the farmer's livelihoods.**



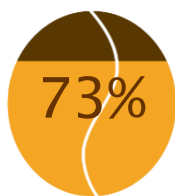
Coffee cherry –or “Sultana” beverages naturally contain caffeine and antioxidants that can be utilized to market this valuable by-product of green coffee production. Image: Café Typica, Bolivia

### Local markets as a chance

Direct sale of green coffee to international customers or the sale of roasted coffee on the local market or even in own coffee shops were the most beneficial value chain models. In Colombia, coffee consumption increases every year between 4 and 9%. While around 14 million bags are produced every year, two million bags are consumed nationally, and about another million bags are imported every year. We observed an **improved farmer-buyer relationship** in high-quality coffee value chains. Close **long-term relationships** pay off with better bargaining power of farmers, **higher knowledge through mutual learning**, a resulting **better quality** in all processing steps, and therefore a much **higher price** than for conventional coffee. Even though farmers had higher incomes when involved in high-quality coffee value chains, often there was **no improvement of the overall household situation** (housing, machinery, equipment, transportation). We observed a **lack of knowledge in financial planning and bookkeeping** in order to manage costs of production and to streamline revenues. In Bolivia, farmer families struggled **with limited access to healthcare, education, sanitary facilities** and are very **vulnerable to health-related costs**. In Colombia, farmers producing specialty coffee moved to a **contributory health system** and were less vulnerable to health costs.



Six out of 10 Bolivians drink coffee regularly



73 % of Bolivians consume instant coffee



> 80 % of the coffee consumed in Bolivia is imported

Source: Urioste, 2018

### Specialty coffee is not necessarily sustainable

In Bolivia, we witness a **shift towards coffee monocultures and pesticide-intensive farming** systems (Compigne, 2018). In Colombia, most coffee farmers **produce non-shade coffee**, which contributes to, and is affected by, **climate change and biodiversity loss**.



A diversified coffee agroforestry system (left) and a monoculture on a steep slope (right). Images: Johanna Jacobi

### Green coffee and coffee cherry quality

#### **Coffee cherry properties related to storage and drying:**

We investigated health-promoting substances (flavonoids, chlorogenic acids, caffeine) in coffee cherry (Sultana) samples from Colombia and Bolivia that were dried and stored differently. During storage of one year, we found a decrease of 30-50% in flavonoids and chlorogenic acids. It is therefore advisable to consume coffee cherry products as freshly as possible. We also investigated the influence of temperature when drying Sultana at >50°C in an oven compared to natural shade-drying. Shade dried sultana contained significantly higher amounts of flavonoids and chlorogenic acid than the samples dried in the oven. We recommend drying conditions where temperatures over 40°C can be avoided.

#### **Coffee drying experiment in Bolivia:**

Proper drying is a prerequisite for green coffee quality, but several samples from the Yungas region in Bolivia showed mold-related green coffee defects. From the analysis of coffee dried in the Yungas and in the city of El Alto, we recommend to dry coffee in the Yungas first and finish drying in El Alto, since these samples performed best from a sensory perspective. It seems advisable to initially dry coffee as quickly as possible to a) avoid high water activities that favour microbial growth and b) stop the metabolic activity of the embryo. Such fast drying is achieved at warm places of medium air humidity. In a second phase, slow drying is advisable, which can be achieved in El Alto at 4000 m.a.s.l.



**Coffee processing methods in Colombia:** We investigated washed, semi-washed and natural processing methods and the chemical composition of two *C. arabica* varieties, Castillo and Caturra. Processing strongly influenced the chemical composition of the green bean, and wet processed coffee could be clearly distinguished from the other processing methods. Semi-washed and natural processed coffee, which involve relatively long drying times, could not be clearly separated by the process itself, but by variety. With a long processing time, the variety seems to become more important in the distinction of coffees from a chemical perspective. Our research shows that processing leaves its chemical traces in the coffee beans, which allows predicting sensory properties via analysis of green beans. This applies, for example, to the higher acidity of the wet processed green beans, in particular for the Castillo variety that is known for its pronounced acidity. Drying coffee at low altitudes or with frequent rains remains a challenge for the processing of natural coffee in Colombia. Natural processed coffee takes longest to dry, and mold or excessive fermentation bear high risks to coffee quality. The diversification of processes, and the knowledge of how to produce high-quality coffees (not only natural, but also experimental processing methods) could be an important step towards new niche markets for Colombian coffee farmers.

#### **Institutional and policy needs, Colombia**

The Colombian Coffee Growers Federation (FNC) is the leading institution that has guided, regulated and directed the coffee sector for 90 years. It has strong ties to the national government and international organizations. The FNC has created a complete set of organizational instruments that intervenes at every link in Colombia's coffee value chain: from the implementation of a *purchase guarantee program* that guarantees to buy coffee from Colombian producers to the regulations for export and marketing in the country. However, support from the FNC and its organizations focuses mainly on the technical level. Besides more extension services, we recommend a **focus on strengthening the ties of small producers' associations**, which constitute 90% of coffee farmers.

**We further recommend to adopt guidelines and regulations towards sustainability and climate resilience** (e.g. agroforestry and diversified farming systems) in coffee production, and include farmers in the whole value chain. Moreover, **we propose policies for improving the living conditions in rural areas**, such as quality education, safety measures, access to public services, housing and health services as well as improving road infrastructure that enable better exchange between rural and urban areas. Colombia's **capacity for research and innovation in coffee** should be strengthened. Support to **local coffee businesses** selling high-quality coffee and coffee by-products and encouraging **domestic coffee consumption** should be prioritized to reduce farmer's dependence on green coffee exports.

#### **Institutional and policy needs, Bolivia**

One major problem in the Bolivian coffee sector is the lack of a clear representation by a unified coffee organization. Currently, there are three organizations representing the coffee sector (FECAFEB, ANPROCA and ANAPCAFE), which implies conflicts of interests. Parallel, competing organizations jeopardize efficient support of the coffee sector. **Establishing one multi-stakeholder organization representing the coffee sector would be the most urgent policy initiative.** The annual "Presidential Cup" contest is a good example of cooperation between different actors, but the integration of specific stakeholders is still not working due to a lack of mutual acceptance. We also found that producers are not well connected with other actors (e.g. consumers and baristas), and there is a prevailing view that roasters and exporters are competitors. Although the Bolivian coffee policy considers necessary ecological aspects such as supporting agroforestry production systems, other important aspects such as a clear focus on quality and associated knowledge are missing. In view of the ongoing coffee price crisis, increased competition on international markets and high production costs, no mechanisms have been proposed to compensate for yield loss and to promote producers' competitiveness.



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## Policy recommendations

- **Focus on sustainable coffee production, and on quality and transparency in the value chain:** Producers need minimum prices that enable them to produce in an eco-friendly and climate-change-resilient way, since processing industries and consumers move towards zero-deforestation policies. The specialty coffee market with its focus on quality is a chance for shorter value chains, agroforestry systems, higher prices for green coffee, more involvement of farmers in value chains, strengthened farmers' organizations, and more transparency for consumers.
- **Coffee cherries as a new source of income:** Coffee cherry products contain the biological active non-nutrient components caffeine, flavonoids and chlorogenic acids. They can therefore be branded as "healthy energizers". However, the production as well as use of coffee cherries in high-value foods and beverages needs to be professionalized and advertised more among producers as well as consumers.
- **Improving green coffee quality** can open new markets in the fast-growing segment of specialty coffee. Both coffee cultivation as well as post-harvest processing can be targeted to deliver high quality coffee, and for some micro lots even highest quality. The respective farm needs to have the necessary prerequisites, either access to clean equipment, streamlined processing facilities or proper environmental conditions to manage, e.g. the production of natural processed coffee. Fostering local markets, and in particular farmers' engagement in local value chains from processing to marketing, gastronomy and consumption of local coffee could become a valid alternative to exporting green coffee.
- **Integration of stakeholders and a value chain approach** to foster the growing high-quality coffee drinking culture in origin countries: Strengthen research ties, unify different actors, share knowledge and raise awareness of local/national coffee quality to decrease dependence on import/export markets and to enhance direct trade relationships.

## References and suggested further reading:

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This document was elaborated in the frame of the research project "Improving rural livelihoods through promoting high-quality coffee and coffee cherry products in the origin countries Colombia and Bolivia". The project's objective was to provide knowledge for development and implementation of strategies and policies that benefit the coffee sector with a focus on small-scale producers. Link: <https://snis.ch/project/improving-rural-livelihoods-through-promoting-high-quality-coffee-and-coffee-cherry-products-in-the-origin-countries-colombia-and-bolivia/>

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