Chapter 3 Agroecological management of coffee for sustainable production: Ayotzin offee case – union of producers, Cuetzalan del Progreso, Puebla

Capítulo 3 Manejo agroecológico del café para la producción sustentable: caso ofertorio Ayotzin - unión de productores, Cuetzalan del Progreso, Puebla

BORDA-JUAREZ, Isaac*

Café Ayotzin – Unión de Productores, Ayotzinapan, Cuetzalan del Progreso, Puebla, CP 73560, México.

ID 1st Author: *Issac, Borda-Juarez* / **ORC ID:** 0009-0006-9591-8392

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I. Borda

* isaacbj49@gmail.com

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Abstract

In Mexico, coffee production is grown on small extensions of land, mostly by indigenous producers, with an average of 1.4 hectares (Ha) per producer. The production zones are characterized by latitude, altitude and by the conditions of marginalization and poverty of the producers. In Café Ayotzin we start by working on the organization of the producers to carry out a field sampling to carry out an agroecological and sustainable management that benefits the yields in coffee production, having as main objective the recovery of coffee production in quantity (ton ha^{-1}) and quality (cup value) to generate confidence in the producer, avoiding intermediation, practicing fair trade and sustainability. The field work is carried out with technical advice on seed selection, germination and nurseries, management of good cultural practices such as pruning, fertilization with bocashi or biol, application of insecticides such as Bordeaux mixture, and the transplanting of new plants in the field. Finally, advice is given on the management of the wet and dry processing to obtain the final product, a pure roasted and ground coffee. With the good practices in the field and the commitment to manage the plants in an agroecological manner, we went from obtaining less than 1.5-ton ha^{-1} in the region to producing 2.1 ton ha^{-1} per producer.

Coffee, Sustainability, Production, Agroecological, Management, Poverty, Management, Poverty

Resumen

En México, la producción de café se cultiva en pequeñas extensiones de terreno la mayoría por productores indígenas teniendo un promedio de 1.4 hectáreas (Ha) por productor. Las zonas de producción se caracterizan por la latitud, altitud y por las condiciones de marginación y pobreza de los productores. En Café Ayotzin se empieza trabajando por la organización de los productores para realizar un muestreo de terreno para llevar a cabo un manejo agroecológico y sustentable que beneficie los rendimientos en la producción de café, teniendo como objetivo principal la recuperación de la producción de café en cantidad (ton ha^{-1}) y calidad (valor en taza) para generar confianza en el productor evitando el intermediarismo, practicando el comercio justo y la sustentabilidad. El trabajo en campo se realiza con el asesoramiento técnico en la selección de semillas, realización de germinadores y viveros, manejo de buenas prácticas culturales como: poda, fertilización con bocashi o biol, aplicación de insecticidas como caldo bordelés, y el trasplante en campo de las nuevas platas. Finalmente se asesora en el manejo del beneficio húmedo y seco para obtener el producto final, un café puro tostado y molido. Con las buenas prácticas en campo y el compromiso en el manejo de las plantas de una forma agroecológica se pasó de obtener menos de 1.5 ton ha^{-1} en la región a producir 2.1 ton ha^{-1} por productor.

Café, Sustentabilidad, Producción, Agroecológico, Manejo, Pobreza

3 Introduction

In Mexico, coffee production is cultivated on small plots of land by mostly indigenous producers. Normally due to the altitude and latitude that favours production, they are characterised by areas where producers live in conditions of marginalisation and poverty. Poor marketing and management of coffee production has resulted in low prices, which leads to a decrease in income, unemployment, migration and total or partial abandonment of the farms, which generates a deepening of poverty in the families that depend on this activity.

At the national level, the majority of producers are smallholders, with an average of 1.4 hectares (ha) per producer, i.e., of the 684,763-ha planted with coffee, there are only 486,314 producers, 70% of which are indigenous (Aragón. 2006).

For this reason, the coffee sector in Mexico has participated in the history and economic, political, social and cultural development of the country, where production is connected to the international or national market through regional hoarders, brokers and transnational companies, who demand the beans from regional processing and marketing companies (Martínez, 1996).

Puebla is the third largest coffee-producing state in the country; 75% is destined for export, mainly washed raw coffee and high altitude coffee. According to the Sistema Producto Café (SIAP, 2015), the municipality of Cuetzalan has a harvested area of 4800 hectares, a production of 8833 tonnes and a yield of 1.84 tonnes per hectare (ton ha-1). The municipality has 5786 coffee producers (Ramírez et al., 2006).

Currently, Cuetzalan del Progreso produces 6,582 tons (Blog gobmx, 2023) which indicates a low coffee production, identifying as main problems: low productivity (-1.5-ton ha^{-1}) preferring to produce other agricultural products, low technology in the field, poor management of agricultural practices, inappropriate coffee varieties, technical and commercial training, adverse climatic events and phytosanitary problems (borer, rust, etc.) among others. These problems cause the majority of producers to be displaced in search of better income for their families, choosing to move to cities for better living conditions and as a consequence abandoning the coffee field.

The objective of this work, the creation of the Café Ayotzin brand in conjunction with the producers' organisation (Unión de Productores de Café) is the recovery of coffee production in terms of quantity (ton ha^{-1}) and quality (cup value) in order to generate confidence in the producer, avoiding middlemen, practising fair trade and sustainability.

3.1 Methodology

Café Ayotzin was born on December 18, 2019 in the community of Ayotzinapan, Cuetzalan del Progreso, Puebla, consolidated by a group of producers in the region with the support of technicians for advice, in order to return to ensure confidence in their production, and seek to recover the yield of coffee within the communities of the municipality, which in previous years supported the economy of indigenous families making this production sustainable, environmentally friendly and with timely use of natural resources.

The purpose of CAFÉ AYOTZIN "help to produce" is to support the producer in a complete technical advice from the selection of the best seeds for the realization of a germinator to later make a nursery to carry out the cultural practices within the farm, and its harvest; in addition to this, the added value and brand to coffee is implemented, taking it to the packaging: This is done in an artisanal way by the practice of the inhabitants who have been managing it for more than 40 years, generating a plus in the profits of the producers and avoiding the middleman.

Sixty percent of the producers have secondary schooling and 40% primary schooling, their mother tongue is Nahuatl, with Spanish as a second language, 75% are between 45 and 55 years old and 25% between 60 and 75 years old, with a total group of 37 producers located in the communities of Ayotzinapan, Xaltipan and Reyeshogpan, with an average of 1.25 hectares of land producing arabica coffee of the typica varieties: caturra and geisha; and hybrid varieties such as: mundo novo, oro azteca and costa rica.

Café Ayotzin begins its work in the field with the producers in the technical advice in their plots carrying out:

1. Organization of groups.
2. Production problems.
3. Identification of the variety.
4. Selection of the best seeds.
5. Sowing in the field.
6. Agricultural practices.
7. Harvesting.

8. Wet and dry processing.

9. Roasting.

10. Milling of Ayotzin coffee.

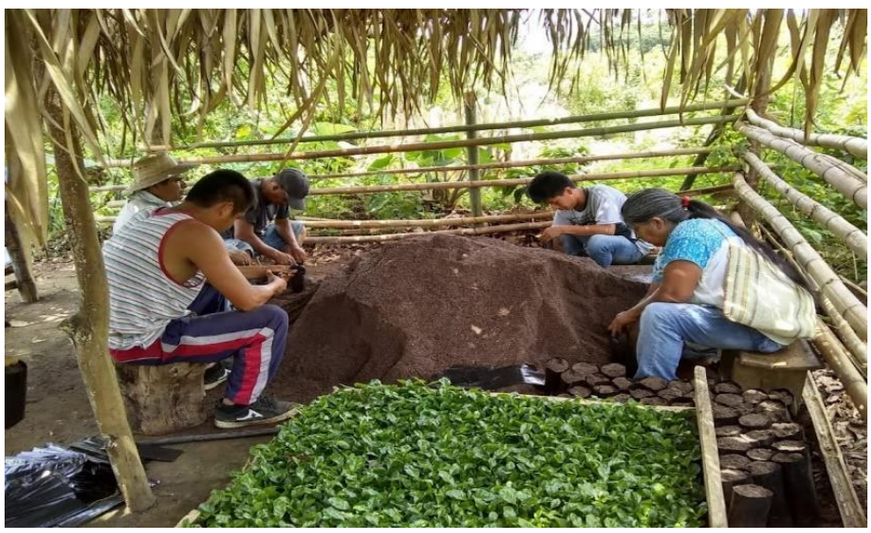
The organization of the groups begins with the extension of the work programme, offering technical follow-up in the field, guaranteeing added value to the final product. The producers who join the work team begin with the evaluation of the farm, taking soil samples to obtain the hydrogen ion potential (pH), where an average of 5.3 was obtained, which is an acceptable range for coffee production, as indicated by Sadeghian, 2016. 3 which is an acceptable range for coffee production as indicated by Sadeghian, 2016 where the optimum point is 5 to 5.5 pH, on the other hand the soil texture was evaluated obtaining 90% of soil loam-sandy clay and 10% with sandy loam texture and finally the thickness of the mulch had an average of 3.5 centimeters (cm) being 60% and 40% of 4.7 cm. Subsequently, the problems began to be corrected, starting with the mulch to reach the optimum, which is 5 cm thick, and in some farms the pH levels were corrected.

Once the variety had been identified, the selection of the best fruit from each plot and from each producer began, in order to be able to make the germinators and then organise the people to equip the nursery, which is why the geisha fruit was chosen and selected for its cup quality; oro azteca and mundo novo, for their resistance to pests and diseases.

The germination of the germinators is done by training the personnel for the maintenance of the same, obtaining a range of germination of 60 to 70 days, and from 80-90 days the chapolas are obtained, which with two fully extended cotyledonous leaves are transplanted to the nursery with fertile soil, obtaining from the preparation of organic fertilisers such as bocashi.

After 7 to 8 months and reaching a height of 15 to 20 cm, the coffee plants can be transplanted in the ground with prior advice, where a distance of 1.70 meters (m) long x 1.40 meters (m) wide for geisha, 2 m x 1.70 m for mundo novo and 1.90 m x 1.60 m for oro azteca, all plants were distributed equally according to their needs of varieties in each producer.

Figure 3 Sowing coffee in germinators with single rows or broadcast



Working in a sustainable way, we choose to maintain the plots by pruning, fertilising with organic fertilisers or biols and fighting pests using sulphocalcic broths and cleaning the plots using the "chapote" (cleaning with a machete) to avoid the use of herbicides.

Figure 3.1 Soil preparation and transplanting of the seedling to the nursery

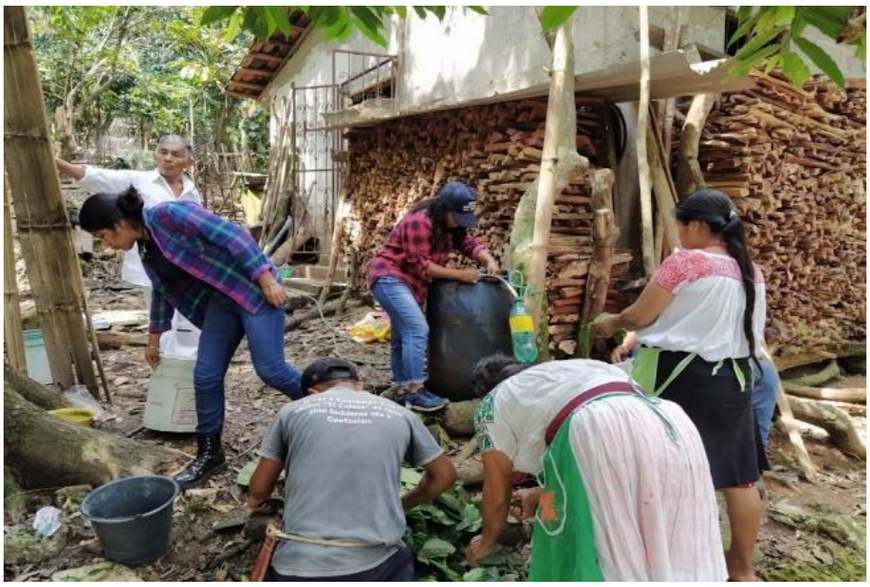
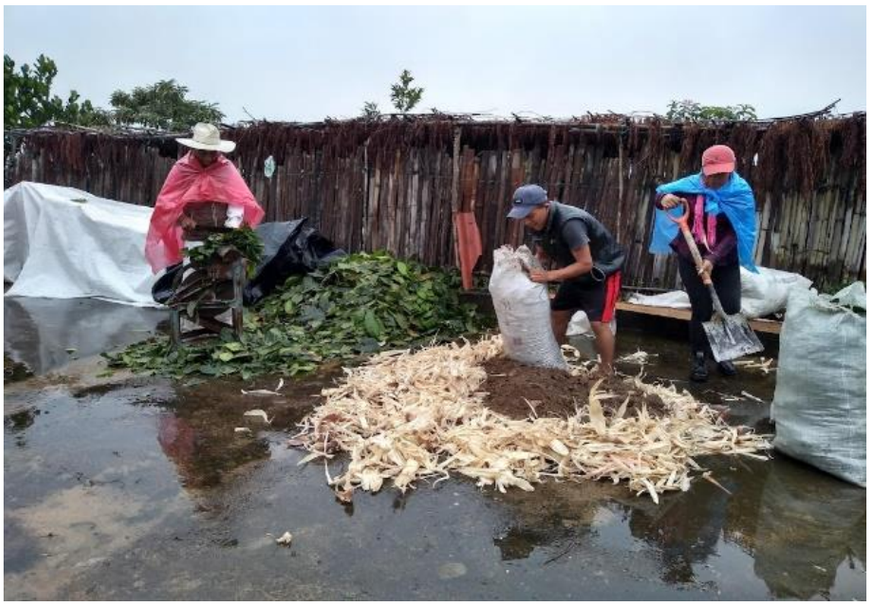


Figure 3.2 Preparation of Bocashi



During harvesting, the fruit is strategically selected in three stages: intense dark-red, light-red and yellow-red, which will influence the cup quality, specifically the body and acidity.

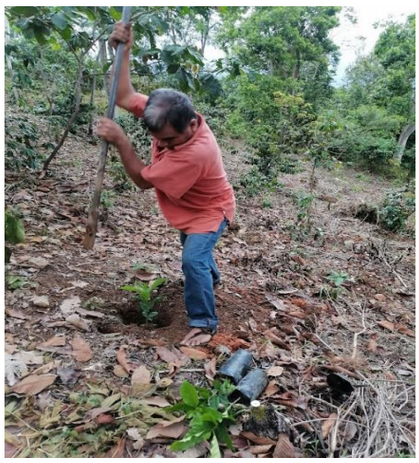
After harvesting, the ripe fruit is selected, avoiding dried or half-seeded fruit for subsequent pulping. Washing can be carried out in three ways depending on market demand: natural washing, where after pulping it is left to ferment for 24 to 48 hours for subsequent washing, natural or dry process where the ripe fruit is left to dry in the open air without the need for pulping so that it absorbs the sugars better and the last process is honney or enmielado where after pulping it is left to dry with the mucilage of the coffee.

After drying the parchment coffee, the different seeds are classified into different sizes for subsequent cleaning and thus obtaining the gold or green coffee, which is then classified again for roasting and grinding, and finally for packaging.

All the residues obtained in each process are handled for their subsequent reincorporation on the farm, either to be used as fertiliser or to be reused to increase the mulch and thus avoid all types of erosion or landslides due to the slopes and rains in the area.

3.2 Results

Figure 3.3 Obtaining coffee seedlings planted on the farms of each producer



The organisation of the people and the follow-up in the field to improve their production in terms of quality and quantity, a yield of 2.1 ton ha^{-1} is obtained, thanks to a previous diagnosis of the land to carry out an agro-ecological and sustainable management.

The timely implementation and advice at each stage of production led to obtaining a quality coffee with higher yields, while at the same time the idea of working the farms without overexploiting them, generating a friendly environment in the biomass and coffee ecosystem is taken up again.

This is how the final product, ground and roasted coffee in its different presentations, is inserted into the national and international market, working in fair trade to support the economy of the families, boosting their production.

3.3 Conclusions

The agricultural crisis of coffee in Cuetzalan has caused people to move to other activities that generate support for their families, for this reason the project has returned to embrace and generate confidence in the producers by the way of working and the results obtained, that is why Ayotzin Coffee becomes a sustainable, efficient, productive and inclusive project becoming an organic production system.

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