

Abstract

In recent years, there has been a drastic increase in the demand for avocados in the United States and Europe (and more recently in China). Increased profits for growers have led to a large-scale intensification of avocado production in Mexico, especially in the state of Michoacán. The expansion of the avocado industry comes with environmental consequences, including land use change, deforestation and reductions in biodiversity. Moreover, the impact of avocado production on the local economy of Michoacán has been significant and nuanced. Overall, the avocado industry in Mexico is a complex and dynamic subject, influenced by social, political and ecological factors at the local, national and international levels. As local farmers race to meet growing and shifting international demand, risks for negative social and environmental impacts are high. However, a more complete understanding of the avocado commodity chain will help inform policies that encourage intelligent, sustainable expansion of avocado production, to minimize long-term negative impact.

Background

- Forty percent of the world's avocados are grown in Mexico, and within Mexico, 80% of avocado production occurs in the state of Michoacán (Barsimantov, 2012).
- Between 1991 and 1998, export volumes from Mexico almost quadrupled, increasing from 13,000 tons to 47,000 tons (Barsimantov, 2012). The amount of land dedicated to avocado production in Michoacán has increased from 13,350 hectares in 1968 to 23,000 hectares in 1975, 78,500 hectares in 2000 and more than 86,500 hectares in 2006 (Barsimantov, 2012).
- The average yield in Michoacán is around 6,500 pounds of fruit per acre; although in the best orchards, yields can reach up to 15,000 pounds per acre. As a point of comparison, the average yield in the avocado growing region of California is 5,600 pounds per acre (University of Hawaii).

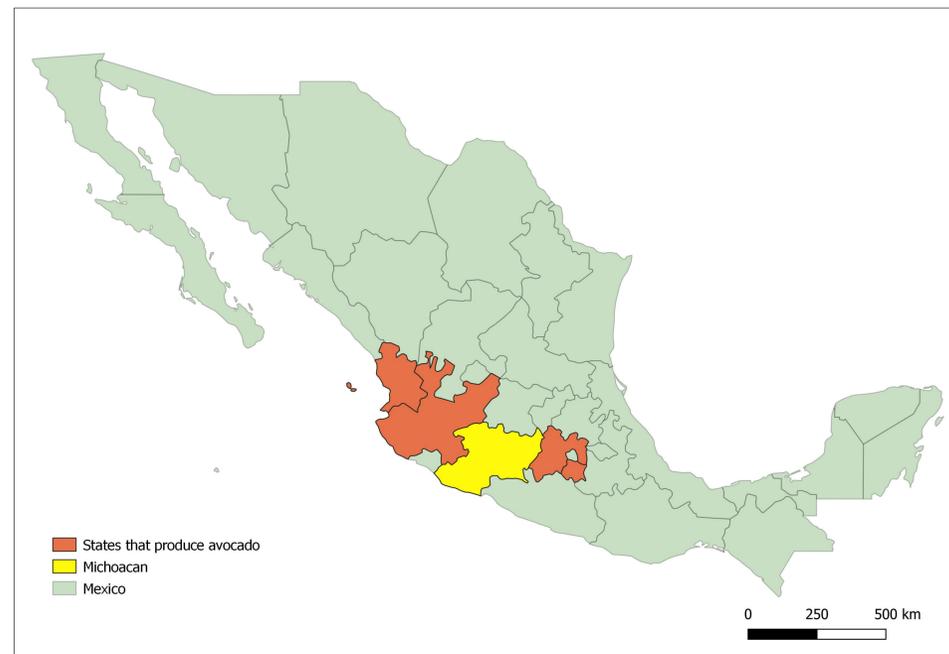
Research Questions

- What has caused the boom in avocado cultivation in Michoacán?
- What is the socio-economic impact of the avocado industry in Michoacán?
- What is the environmental impact of the avocado industry in Michoacán?



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Figure 1. The "Avocado Belt" in Mexico



Map created in QGIS by author

What has caused the boom in avocado cultivation in Michoacán?

- Avocado exports to the United States began in 1997, after the passage of the North American Free Trade Agreement (NAFTA) in 1994 and a few years of negotiations with California growers (Barsimantov, 2012).
- The promotion of international avocado exports has been a concerted effort among Mexican avocado farmers, and the process has illuminated the power dynamics and multifaceted relationships between the export market, the Mexican federal government, and both elite, commercial and smallholder avocado producers.
- A small group of elite commercial growers exerted power in the creation of legal standards that affect all growers in Michoacán. They worked with the Mexican federal government to impose legal standards for growers who intended to export to the United States, and they lobbied the USDA to lift the ban (Stanford, 2002).

What is the socio-economic impact of the avocado industry in Michoacán?

- In 2003, the Asociación Agrícola Local de Productores de Aguacate en Uruapan Michoacán México (APROAM) counted the creation of "47,000 direct jobs, 70,000 seasonal jobs and 187,000 indirect, permanent jobs" by the avocado industry (Dorantes, 2004).
- When compared with non-producing municipalities, avocado-producing towns have seen a larger decrease in migration and larger reductions in poverty (non-producing towns also saw decreases in these two metrics, but not as large) (Villanueva Tomas, 2018).
- Michoacán still suffers from high levels of poverty. The economic benefits provided by the avocado industry do not seem to match the magnitude of profits gained by the avocado boom (Villanueva Tomas, 2018).

What is the environmental impact of the avocado industry in Michoacán?

Land use change: The amount of land dedicated to growing avocados in Mexico increased by 7.3% between 2016 and 2017, and this number is expected to continue rising as production increases within Michoacán and as new states begin to expand their own avocado industries (Flores, 2017).

Deforestation: Between 1990 and 2006, 33.1% of forest was lost in elevations above 1200 m. At the ideal altitudinal band for avocado growth (1200–2500 m), the percentage lost is even higher, at 39.5% (Barsimantov, 2012).

Biodiversity: There is a reduction in herpetofauna biodiversity in plantations as compared to tropical forest; but interestingly, no significant difference was found in herpetofauna species richness between the orchards and nearby coniferous forest. Even more interesting is that beta diversity of herpetofauna was high, and there were some species found in the avocado farms that were not found in either nearby forest (Marroquín-Páramo, 2017).

Soil Degradation: Intensive avocado farming was correlated with reduced soil fertility (i.e. reduced nitrogen content) and increased water runoff, which causes soil erosion (Bravo-Espinosa, 2014).

Water Management: Human populations in certain areas of Michoacán have had to invest heavily in digging deeper wells in order to reach the dropping water table (Chavez Leon 2014). There are reports of illegal wells, mismanagement of traditionally used springs, and social conflict over water as a result of water scarcity in the area (Ramirez Cuevas 2018).

Conclusions

The avocado boom in Michoacán was a result of neoliberal policies encouraging free trade between the U.S. and Mexico, promoted both by the countries' governments, as well as the elite commercial avocado growers within Mexico. The growth of industry has created jobs, decreased poverty, and decreased migration, but the equitable distribution of benefits needs to be investigated further. The environmental impact of the avocado boom is large, and it spans many aspects of the environment, including forests, soil, and water.

Future Research Questions

- What environmental and socio-economic factors influence the expansion of avocado into certain areas?
- How does expansion of avocado cultivation impact ecosystem services (such as carbon sequestration) in the Mexican landscape?
- How does individual decision making, government policy, and/or economic incentive shape the environmental impact of the avocado industry?

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