



The Economics of Ecosystems and Biodiversity TEEB for Agriculture & Food Global Symposium, February 2019

Ecosystems and agro-biodiversity across small and large-scale maize production systems, feeder study to the “TEEB for Agriculture and Food”

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Supported by:



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of Ecosystems
& Biodiversity

based on a decision of the German Bundestag

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Background

- The National Commission for the Knowledge and Use of Biodiversity (CONABIO) carried out a valuation of ecosystem services associated with maize production in three countries
- USA, Mexico and Ecuador in the following production systems
 1. Smallholder traditional farmers (itinerant and permanent)
 2. Intensive high-yield systems (irrigated and rainfed)
 3. Organic systems (small and large scale)

The study was broad and dealt with multiple topics

- Context
- Non monetary valuation
 - genetic externalities of maize production
 - impacts of maize production practices on ecosystem services
 - cultural value of maize
- Monetary valuation
 - value of green water provision
 - costs of grey water
- Public policy recommendations
- <http://teebweb.org/agrifood/home/maize/>

CONABIO Interests

- A priority for Mexico is to show the importance of agrobiodiversity for the present and future of global food security and as key supplier of **evolutionary services** (or evo-system services)
- Evolutionary services: ‘the uses or services to humans that are produced from the evolutionary process’ (Faith et al. 2010)
- An area that is fundamental, but usually ignored
- Genetic externalities of maize production in intensive systems and among smallholder farmers
- Genetic diversity is the basis for crop adaptation to different environments and changing conditions

Focus on the contributions of smallholder maize farmers (*campesinos*) in Mexico

- Smallholder maize farmers under rainfed conditions produce two poorly recognized positive externalities:
 1. More maize produced and people fed than would have occurred if farmers were purely profit-driven
 - enough maize to potentially feed 54.7 million people (48.7% of the national population) in 2010
 2. Given the large scale and diverse environmental scope of their maize production, the native maize populations they grow maintain rare alleles and generate new adaptive genetic variation
 - producing an evolutionary services of global relevance given the importance of maize for the world
- Article “Evolutionary and food supply implications of ongoing maize domestication by Mexican campesinos” *Proceedings of the Royal Society B* **285**:20181049. (<http://dx.doi.org/10.1098/rspb.2018.1049>)

Mexican *campesinos* produce rainfed maize in a large area and a wide range of environments compared to commercial farmers comerciales

