PROPOSALS FOR ENHANCING THE ADAPTATION CAPACITY OF SMALL COFFEE PRODUCERS

In the midst of a changing climate, small farmers are diversifying their agricultural practices while looking for a balance between achieving productivity, environmental conservation and financial security. To support this adaptation process, it is necessary to consider the following aspects:

1. Providing microfinance in the form of small loans or insurance for small coffee producers can enable investment in technical capacity to improve productivity.
2. Building collaboration networks with governmental organizations, NGOs, universities and other organizations can help increase the capacity of certification schemes and provide a stronger support network for farmers.
3. Training should be provided on topics including agroecology, integrated plague control, soil conservation, efficient use and storage of water, value chains, disaster prevention and climate change.
4. Strengthening of basic social organizations that promote collective democratic processes, natural resources management and climate adaptation should take place.
5. Promotion of the economic benefits of environmental services as well as mechanisms that improve income should be carried out.
6. Diversification at all levels (e.g. agricultural practices, income generation, production activities) is acknowledged as one of the best strategies for adaptation to a changing climate. Support for small producers in diversifying should be provided.
7. Incentives that aid producers in managing projects of agricultural diversification under the "Adaptation based on Ecosystems" program are necessary.
8. Promotion of commercialization channels can support small producers in strengthening their value chains to obtain higher profit margins.

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Global Changes and Coffee Project Web Page
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GLOBAL CHANGES AND COFFEE

ADAPTATION OPTIONS FOR SMALL COFFEE PRODUCERS IN A CHANGING CLIMATE: THE CHALLENGES OF CERTIFICATION FOR ECOSYSTEM SERVICES

Mesoamerica is a region of great cultural and natural wealth which has been exposed to extreme climatic events whose impacts are exacerbated by the region's geographical situation and topography. To make things worse, its vulnerability is also increased because of its high levels of poverty and social exclusion which countries of this region have historically suffered.

In this scenario, one finds coffee production, an activity which not only represents economic income for many households, but is a natural and cultural patrimony, as well. Coffee is one of the most important contributors to the Gross Domestic Product (GDP) in Latin American countries not only because of the income its exportation produces, but also because of the jobs it provides for millions of people who work primarily in the harvesting of coffee beans. Despite these benefits, coffee farmers constantly face multiple internal and external pressures that affect their economy. Among these pressures, there are several that depend on global variables such as price fluctuation, pests and other coffee diseases, and climate change.

Within this context, the project "Global Change and Coffee" has emerged. This project aims to study adaptation strategies implemented by coffee-producing families who are confronting these global changes in Costa Rica, Guatemala, Honduras, and Mexico.
The project was carried out in three phases, from 2003 to 2015. In the third phase agricultural practices promoted by coffee certification schemes were evaluated in order to determine whether they helped cultivate a more resilient ecosystem in response to global change.

This document consists of a brief history of what was learned in these twelve years of research, with emphasis on the results obtained during the last phase of the project. The intent is that this information informs public and private decision makers so that their decisions contribute to the strengthening of adaptation capacities of coffee producers who are facing global change.

Why investigate the effects of coffee certified agricultural practices as an option for climate adaptation?

Coffee certification provides the consumer with a guarantee that the product they are buying meets quality standards, such as international fair trade or organic standards. In order to meet these standards, producers must adhere to guidelines on working conditions, natural resources conservation and financial viability of agricultural activities. The fulfillment of these standards often requires investment in infrastructure, improving administration and product transformation processes; but primarily it involves making changes in agricultural practices.

Agricultural practices promoted by certification agents are oriented to improve the ecosystem services in the production system. In this case, coffee agroforestry systems provide various ecosystem services and allow improvements in balancing of conservation and production, when compared to other crop systems.

In implementing these practices there is the potential for producers to create an improved ecosystem and working conditions, leading to an overall more resilient system in response to climate variations. We therefore approached the study by taking a more holistic view of the certification processes, as promotion of these practices is linked to the concept of Adaptation based on Ecosystems (AbE): a set of policies and practices based on the premise that the adequate flux of ecosystem services reduces the vulnerability of the population to climate change.

This study was carried out across four sites: Chiapas, México; Santa Rosa, Guatemala; Lempira, Honduras and León Cortez, Costa Rica. In each country, we monitored 10 farms (12 in Mexico), 5 certified and 5 non-certified. From these 10 farms, 8 belonged to small producers and 2 to large producers. The selected farms were between the 1200-1800 m.a.s.l. In each farm agro-ecological conditions of the crop were measured including productivity, shade coverage and plagues. Further socio-economic information was collected using a survey.

What differences were found between certified and non-certified producers?

Table 1. Mean of the variables to compare plantations of certified and non-certified producers

VARIABLES	CERTIFIED (N= 21)	NON-CERTIFIED (N =19)
Agro-ecological conditions		
Area with coffee planted (ha) for large producers (medium)	55 (N=4)	25 (N=5)
Area with coffee planted (ha) for small producers	4.1	4.1
Percentage of shade in the plantation	60% of producers with a canopy closure higher than 65%.	60% of producers with a canopy closure lower than 30%.
Stock in trees (ton C/Ha)	34.4	24.1
Stock in coffee plants (ton C/Ha)	4.7	4.8
Number of tree species used for shade	8	6
Three dominant varieties of coffee	Catuai (47%) Bourbon (19%) Caturra (14%)	Catuai (42%) Bourbon (16%) Caturra (16%)
Pests and diseases		
Pest or disease which has most impact on the crop	Rust (57%) Borer beetle (22%) American leaf spot (11%)	Rust (56%) Borer beetle (19%) American leaf spot (13%)
Climate		
Climatic event which has affected the most	Storms (28%)	Storms (37%)
Social Organization		
Belongs to a social organization	86%	47%
Productivity and commercialization		
Number of products bound to home consumption	6	9
Number of products bound to sale	11	10
Conventional production	47%	84%
Organic production	52%	15%
Last year´s yield* (kg parchment coffee/ha)	1,088 kg	1,323 kg
Production costs* (USD per kg of parchment coffee)	$1.43	$1.19
Price of the sold coffee* (USD per kg of parchment coffee)	$2.12	1.82

*It is important to clarify that the data of yield, prices and costs of production are estimates reported by the producers. To be able to compare between countries, these estimates were converted to kg of parchment coffee. The production costs refer to the annual production, excluding certification costs.

No significant differences were observed in agro-ecological conditions between certified and non-certified farms. The principal difference observed is that certified farms tend to have more shadow coverage which leads to more carbon stock. It is important to clarify that the quantity of shadow also depends on the altitude and the humidity of the farm.

Both certified and non-certified farms appeared equally sensitive to plagues and diseases. However, certified producers have more capacity for responding, especially those who belong to consolidated social organizations, because they have better access to training and technical support.

Certified farms reported a lower coffee yield. However, these farms sell their coffee at a higher price, so the reduction in yield may be compensated by a favorable pricing. Production costs are similar across both certified and non-certified farms, but the cost of certification is different for each farm, as this depends on farm conditions at the time of certification and the type of certification applied for (single or collective). Initially, the costs are usually higher, but diminish over time as the cost of maintaining standards is less than the start-up costs.

Historically, farms tended to engage in similar practices for shade management and fencing, such as living barriers. These practices are easy to set up and maintain, and have positive impacts on ecosystems and productivity, therefore accounting for some of the similarities between certified and non-certified farms today. However, now many non-certified producers perform "new" practices that have been brought into certified farms in a similar way (Figure 1), because they have recognized positive financial, productivity and environmental results in their certified counterparts. Overall, shade regulation is the most common practice across both types of farms, as producers believe it is the most helpful strategy for minimizing the effects of the increased climate variation on coffee plantations because shade helps to regulate plantation microclimates.

The main benefit that certified producers report as a result of using specified agricultural practices is a stable or higher price, followed by the improved working conditions. However, non-certified producers still consider the costs of certification too high, believing that the benefits obtained will not compensate this investment.

Financial efficiency is a key factor for farmers making a decision on whether to adopt a certification scheme. We observed two key points in relation to the costs and opportunities of adopting a certification scheme:

1. The certification and commercialization process analyses show that certification does provide product differentiation, but that it takes time for farmers to see the financial benefits in real terms.
2. A cost-benefit analysis of certifications shows that implementation of certified practices is more effective at improving the efficiency of production than improving income.

For some niche market producers, ensuring the quality of their coffee is more important than certification. In this case, the farmers adopt the certified agricultural practices but their primary purpose is to help ensure consistency in yields.

In conclusion, there are several certified social-environmental practices that could support coffee producer adaptation to climate variability. However, we have found no clear evidence to indicate that the agro-ecological and socio-economic conditions of the certified coffee producers guarantee a higher adaptive capacity when compared to non-certified producers. Non-certified producers tend to apply similar practices without engaging in the certification process. It is therefore necessary to continue research into "climate smart" agricultural practices, in order to evaluate their socio-economic and environmental effects on agricultural production and climate resilience.

It is important to communicate these findings to producers, especially those most vulnerable to climate change. Certification presents itself as one valid approach to achieving improvement in productivity, environmental conservation and work and family conditions, although it´s not necessarily the only one.

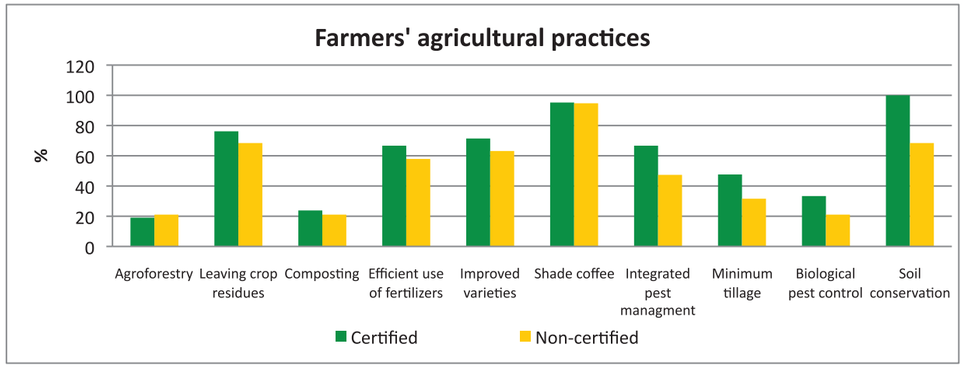

Figure 1. Practices applied by producers taking part in the study. IPM: Integrated Pest Management. BPC: Biological Pest Control.