

Necessity of clear concepts and convergence of discourse for climate-smart agriculture (Costa Rica)

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Since the 80's, many environmentalist discourses were elaborated at the international level, either in the form of technical topics or in the form of broader concepts like "sustainable development". Studying the applications and effects at the local level of these topics and concepts makes it possible to anticipate, design and apply the recent concept of Climate-Smart Agriculture (CSA). Costa Rica is a country where the State promotes environmental protection following the influence of international concepts; CSA concept is already present in some major institutions (such as FAO and CATIE). The country as many countries in Central America, is affected by extreme climatic conditions associated with global change.

Objectives

Identify the characteristics that an environmentalist discourse concerning CSA must have to contribute to its implementation.

Methods

We studied four themes: (i) Mitigation of erosion, (ii) Pollution from fertilization, (iii) Forest conservation and reforestation and (iv) Sustainable agriculture. We compared them with agricultural practices. As **CSA is a recent concept** (FAO, 2010) not yet translated at the local extension services, we postulate that analyzing a range of other environmentalist technical topics or concepts as a proxy will help to determine what could occur to the CSA concept at local level.

The research was conducted in Llano Bonito District, Costa Rica (Fig 1).

- 27 semi-structured interviews (Sibelet et al., 2013) with members of institutions that articulate environmental messages
- 51 semi-structured interviews and 31 surveys with farmers
- 13 semi-structured interviews and 31 surveys with inhabitants
- Participant observations



Figure 1 : Location of Llano Bonito District.

Results

Environmentalist discourses and agricultural practices are always related. Results vary depending on the convergence of the discourse:

THEMES	Mitigation of soil erosion	Pollution from fertilization	Forest conservation and reforestation	Sustainable agriculture
ACTORS				
Cooperative LB		--	Denounces illegal practices of deforestation	Moderate insecticides and fungicides No herbicide
ICE (Costarican Institute of Electricity)	Cultivate coffee under tree cover Reduce use of herbicides	--	Denounces illegal practices of deforestation Promote reforestation of cultivated fields	Reforestation No agrochemicals
MAG (Ministry of Agriculture and Livestock)		--	--	Diversification of the production Reduction of agrochemicals
Farmers	Cultivate coffee under tree cover Reduce use of herbicides	--	Denounces illegal practices of deforestation	Each farmer has his own definition of Sustainable agriculture
Agricultural practices	Cultivate coffee under tree cover 0 to 1 application/year (instead 4 to 5 applications/year 20 years ago)	Overfertilization	Variable The large majority of farmers protect the forest but some have difficulties respecting it	Variable Some farmers protect forest, others diversify their production and others moderate insecticides, fungicides and herbicides.

Table 1 : a) Environmentalist discourses of local actors sorted by themes
b) Agricultural practices related to these themes.

When discourses, which can be focused on the preservation or negligence of the environment, are convergent among the organizations, all farmers follow them. All farmers in the district cultivate shade-grown coffee and apply a maximum of one round of herbicides per year.

When silence reigns or when the discourses are divergent, farmers settle on what best corresponds to their own interests, discourse and practices. The silence on the topic of excess nitrogen leads the farmers to overfertilize in Llano Bonito. Indeed, in the district, the farmers spread an average

of 250 kg/ha/year of nitrogen (N)(Meylan et al. 2013) though it corresponds to the maximum recommended by ICAFE (ICAFE 2011).

Whereas illegal deforestation is denounced by farmers and local institutions, some farmers deforest for economic reasons and lack of control.

Sustainable agriculture is a concept for which each actor develops his own definition. A vague concept such as sustainable agriculture leads to contradictions at the local level.

Conclusion

Experience highlights the necessity to approach the technical topics and concepts linked to Climate Smart Agriculture in a convergent manner in order to avoid instrumentalization and inefficiency in the field.

Moreover international, national and local institutions and farmers have to open spaces and create enabling environments toward a social construction of the concept and the ways to apply it technically in the field. Co-construction should include coherent strategies designed to build a climate-smart territory. This is valid for all countries that wish to upgrade to a real climate smart agriculture.

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