

Innovation platforms for Climate Smart Agriculture in Honduras

The solution for family farmers to overcome climate change effects?

Christian Müller¹, Ricardo Salgado², Marlon Duron³, Jean-Francois Le Coq⁴, Magali de Varax, Catherine Gamba-Trimino⁴, Fanny Howland¹, Eduardo Chia⁵, Omar Gallardo⁶ y Nadine Andrieu¹

¹International Center for Tropical Agriculture (CIAT), ²Honduras Department for Agricultural Science and Technology (DICTA), ³Honduras Ministry of Agriculture, ⁴French Agricultural Research Center for Development (CIRAD), ⁵French National Institute for Agricultural Research (INRA), ⁶La Fundación para la Investigación Participativa con Agricultores de Honduras (FIPAH)

SUMMARY

Innovation Platforms for the adoption of Climate Smart Agriculture for Family farmers (PIASAC) was a project aimed at creating local knowledge and capacities on climate change and finding options for adaption in a participatory way. The project took place in the municipality of Gracias, located in the dry corridor of Honduras. 38 farming families were involved in a 2-year research process facilitated by the Direction of agricultural science and technology (DICTA), with the methodological support of CIRAD under the coordination of CIAT. The project was funded by FONTAGRO.



Collective identification of problems posed by climate change to farming systems. Photo: Marlon Duron (DICTA)

KEY MESSAGES

Farmers already adapt to climate change in diverse ways: farmers already use a large array of climate smart practices particularly those that had a high connectivity to farmer groups and external organizations. In order to adapt their farming systems innovative and participatory learning approaches are necessary.

Community led experimental research has high potential for innovating food production systems: experiments with a community, for example with the introduction of new bean, sorghum, avocado, and maize varieties, can support community learning. The aspects of time, education level of farmers, and participation are key in this matter.

More coherence in policy mix and coordination between organizations is needed: the adoption to CSA needs institutional and policy support. In Honduras there are different political organizations that play a role in different aspects of CSA. The coordination between these organizations is not always sufficient to establish coherence between them which makes the adaption difficult.

Better bridging between national policies and local implementation is necessary: there are differences in how CSA is formulated at policy and national level and how it is in the end implemented. There is a need to strengthen capacities of regional and local organizations to implement holistic and bottom-up methodology locally. Local NGOs can make all the difference.

Participatory Climate Smart Agriculture approach might be crucial for food security in vulnerable areas: innovation platform can be relevant devices for supporting holistic and bottom-up research and development projects with all the relevant actors in agricultural development to prioritize, experiment, and validate solutions to improve food security under climate change constraints.



Traditional agricultural cropping systems called milpa. Photo: M. Duron (DICTA)

INTRODUCTION

CLIMATE CHANGE AND AGRICULTURE IN HONDURAS

Honduras has been identified as one of the most vulnerable and affected countries due to climate change between 1996-2015 in the global climate risk index (Germanwatch, 2017). Climate change will create further adverse circumstances for agricultural production and make corn, bean and coffee cultivation impossible in many areas. Coffee, which is an important cash crop in the area will not be able to be produced in 86% of the currently cultivated area (Bouroncle, et al., 2015). Anticipated climate change effects by 2050 in Central America will make matters worse, with 5-10% less rainfall and warmer temperatures in the order of 2-2.5°C. Further projections predict that rainfall will continue to be erratic and will take more extreme forms (Läderach et al. 2010).

This might have devastating effects on the watersheds and ecosystems of the dry corridor as farmers might deforest higher lying areas for crop cultivation and thus accelerate climate change and contribute to the scarcity of water.

In Honduras vulnerability to climate change is especially severe because it has one of the highest inequality indexes in Latin America, a rural poverty rate of 90% and 54% of the rural population dedicated to the production of basic grains (FAO-RUTA, 2010) y (CEPAL, 2012).

This is problematic particularly in the Dry Corridor, a strip of land along the Pacific coast of Guatemala, El Salvador,

Honduras, Nicaragua and Costa Rica.

The Dry Corridor has a marked and lengthy dry season, and in the rainy season there is always the threat of drought. Drought and excessive rainfall is occurring in a cycle related to the El Niño-Southern Oscillation (ENSO) phenomenon. The Dry Corridor shows high poverty levels, food insecurity, degradation of natural resources and the increasing occurrence of disasters caused by extreme climate-related events (IICA, 2015). Harvest losses in 2015 compromised the food security of 161.000 citizens of Honduras.

In 2015 Honduras declared a state of emergency and called for international assistance. In the affected municipalities 68% of the population (1.3 million inhabitants) suffered from moderate and severe food insecurity and 80% experienced a lack of access to water (SRE, 2015).

Compromised food security and future scenarios led agricultural ministers from Honduras Guatemala, and Salvador to agree on common challenges in the dry corridor and conclude that there is urgent need for adaptation of the production systems of small-scale farmers in June 2016 (FAO, 2016).

In Gracias, a municipality in the Dry Corridor where the project was conducted, these findings were confirmed by interviews and discussions with farming families who expressed that they had experienced problems with drought as well as heavy rains. During the droughts, harvests were lost, and water had become scarce. But

also, the heavy rains during the planting and harvest season lead to losses because crops could not emerge from the soil or the heavy rain damaged crops that were ready to harvest in the fields. The farmers mentioned a lack of income during that time and an increase in food insecurity.

CLIMATE-SMART AGRICULTURE AS SOLUTION

To avoid a lose-lose scenario where agriculture contributes further to climate change effects through deforestation and unsustainable resource use and simultaneously agricultural production and food security are compromised through climate change, the FAO developed the concept of climate smart agriculture

This concept is based on three pillars or principles:

- **Production:** Sustainably increasing the levels of agricultural production and income
- **Adaptation:** Development of resilient production systems adapted to climate change
- **Mitigation:** Reduction or elimination of greenhouse gas emissions where possible

Resilient and efficient production systems with a high mitigation potential that simultaneously offer increased yield and income for farmers can be potentially achieved with many different technologies and practices such as composting or green manure, water reservoirs, reforestation, diversification of crops, integrated pest and disease management, proper harvesting and processing

techniques (Lipper et al., 2014).

In the PIASAC project, the aim was to strengthen the capacities of the farmers in a participatory process to adapt to climate change. It was assumed that an innovation platform could support generation and exchange of knowledge on climate change, exchange and identification and implementation of options for adaptation tailored to local needs by the participating farmers.

PIASAC METHODOLOGY AND RESEARCH STRATEGIES

SELECTION OF PLACE

Four communities in the municipality of Gracias (La Azomada, Rancho Grande, Catatua, El Chaquite) located in the Watershed of Suctal were chosen because most farming families were basic grain or coffee producers on a small scale and were also part of local investigation committees (Classen, et al., 2008) supported by an NGO called FIPAH.

Due to the land reform most farmers were already organized in a farming cooperative and familiar with collaboration with organizations and had experiences with participatory processes.

The communities are in proximity of the protected area of Puca Mountain which has been under the pressure of farmers exploiting new agricultural areas in the protected area.



Discussion with farmers on the results of the first step of the methodology: the baseline study. Photo: Marlon Duron (DICTA)

METHODOLOGY

The design of an innovation platform¹ was attempted because the transition to CSA requires coordination between many actors across the rural landscape as well as effective institutional and policy support (FAO, 2010). Innovating within production system is a multidimensional process with collective nature that depends on the connection of all actors. A participatory innovation platform can therefore be an appropriate tool for learning about, and adopting the CSA concept in a community (Tenywa, et al., 2010).

The methodology was made-up of five main steps:

1. Baseline study to describe and characterize the diversity of farms;
2. Design of the innovation platform;
3. Experiment of CSA practices;
4. Analysis of the policy mix;
5. Final evaluation.

For the **baseline study**, farmer characteristics as well as climate smart practices that were already in use was studied. Furthermore, the tenancy of land was investigated, and production practices characterized. This step was done by conducting interviews and group discussions with 38 farmers.

For the innovation platform design, interviews were done with the community leaders who showed interest for the project. After the interviews, village meetings were held and the “Suctal watershed council” was founded which

¹ Innovation Platforms are multi-actor configurations that facilitate and undertake various activities around opportunities for agricultural innovation on different levels of a agricultural system (e.g. village, country, value chain) (Klerkx et al, 2013)

was the formal organization that would constitute the innovation platform. The council consisted of farmers from the different farmer cooperatives and the savings group of the four communities. Besides, being the innovation platform, the council would also be used to do water management in the watershed.

Sessions were facilitated together with the staff from DICTA, CIAT and FIPAH. Based on a vulnerability analysis made by the Norwegian Agency for Development Cooperation (NORAD), the staff and farmers collectively looked for options for adaptation.

The project was accompanied by several meetings of the board of the Suctal watershed council and meetings of the different farmer groups to compare the established protocols and plans with the state of the activities and to further coordinate.

For experiments with CSA practices, the farmers and facilitators chose experiments with new basic grain varieties, avocado farming, organic fertilizer and pesticide production, reforestation, and food processing as options to adapt.

More sessions were facilitated, and protocols were established on how and by whom the different activities will be coordinated. The different farmer cooperatives established plans for the management of the experimental fields where the new varieties could be observed. Soil fertility workshops were done by DICTA with the farmers in the different locations and soil fertility was assessed.

The different farmer groups received several trainings (76) on crop cultivation (43), doing collective research (1), climate change (3), and finance (6). One farmer group that had opted for the cultivation of improved avocado trees



Vulnerability analysis facilitated by FIPAH to identify collectively options to face climate change and variability. Photo: M. Duron (DICTA)



Gender sensitive analysis vulnerability analysis facilitated by FIPAH to identify collectively options to face climate change and variability. Photo: M. Duron (DICTA)

received a series of trainings (8) on how to establish a tree nursery.

The local women savings group received trainings in financial administration and support (7) in their endeavor to create a food processing business that produces flour of local fruits and vegetables. For this purpose, the design and purchase of a solar drier was arranged.

The reforestation was done jointly with the local school in several sessions (5) where students along with farmers of the cooperatives and staff from DICTA learned how to make a tree nursery and later planted the trees in fields and areas close to the Suctal watershed.

For the policy analysis, furthermore, an analysis of the national and local political and institutional landscape and actors involved in the transition to CSA was undertaken. A review of the different national strategies and policy documents was done and complemented with interviews of members of the implementing organizations as well as a series of interviews with local organizations and the families participating in the project.

ACTIVITIES AND OUTCOMES

BASELINE STUDY

The baseline study on farmer characteristics and farming practices shed light on the distribution of land among the farmers and their weekly working routines, sources of income, the household composition and roles of men and women. Furthermore, the effects of drought on the production of basic grains and coffee could be examined. It was found that the farmers depending on the type of cultivation (for cash or subsistence) had different levels of mitigation adaptation and productivity due to different prioritizations between achieving high levels of agricultural production and ecological sustainability and resilience.

The agricultural practices that were examined showed that

many farmers already apply an array of CSA practices on their farms such as live barriers, minimal tillage, composting and organic pest management. Furthermore, the motivations behind the different practices applied was examined. It was found that the main reason for the application of artificial fertilizer and pesticides is the advantage of saving time and that one barrier of applying agroecological practices in their fields is the large distance of some plots to the home of the farmers.

It was found that families that had a high connectivity to farmer groups and external organizations were among the most climate smart ones.

INNOVATION PLATFORM

The council of the Suctal Watershed was founded and was assumed to be relevant for communication and knowledge sharing. A participatory body to manage water in the Suctal Watershed has been created and farmers in one of the municipalities created a farmer's association together. Furthermore, the different Farmer Cooperatives exchanged knowledge on the different experiments and CSA practices.

Farmers shared knowledge and experiences on how to co-create innovative solutions for adapting to climate change and on decision making and future planning. Such solutions were tested on farm such as the avocado nursery, organic fertilizer and pesticides as well as the solar drier.

EXPERIMENTS OF CSA PRACTICES

On-farm experiments were conducted during the 2016 and 2017 cropping seasons.

Basic grain experiments - The participating farmers learned about basic grain cultivation, collaborative research and tested 12 new varieties of beans and maize.

Reforestation/ Agroforestry - Awareness was raised among participating families and school children for the need of trees in the (agro)ecosystem, around 1000 trees were

planted in farms and areas close to the Suctal watershed.

Avocado Nursery - 14 Farmers were capacitated on the creation and management of an improved variety avocado nursery.

Solar drier - Steps were taken for the women's savings group to receive a solar drier that can serve for processing surplus foods and prolong the availability of food as well as add value to it

Organic fertilizer and pesticides - First interviews were held to support the production of organic fertilizers and pesticides in the area. The interest of more farmers in the application and use of these organic inputs has been raised. Further operations are planned with DICTA

POLICY ANALYSIS

The analysis showed that adaptation to climate change in agriculture and other domains is integrated in the political agenda and policies in Honduras. Climate change is a topic that has an influence on many different domains of policy making and consequently here are many different strategies to respond to climate change. These strategies are often written in an unspecific way. Often the coherence between the interlinked strategies is not clear as well as the hierarchy of the different institutions and strategies.

While the institutions in charge of climate change response keep evolving and efforts are being made it has been evident that the public institutions have limited capacity to reach at smallholder farmers on a large scale to support them in CC adaptation.

In the study area there are several different international and national organizations active in the adaptation to climate change with a wide variety of activities. These organizations differ strongly in the extent to which they collaborate with other organizations and are coherent with national policies or try to empower local institutions. The role of national NGOs has been important as they have had a large impact on producers, but show less coherence with national policies and strategies.

Strategies formulated on national level that do include small-scale agriculture have not yet materialized in actions that reach smallholders.

EVALUATION AND VALIDATION

The project was finalized with an evaluation with the different groups and a validation and exchange of the results and outcomes. The activities of PIASAC and particularly the experiments were discussed, evaluated and validated together with the participating farmers as well as together with the implementing staff from DICTA.

In the evaluation with the farmers the role and impacts of climate change were discussed and the outcomes of the developed activities were shared and evaluated to discuss the success of the project for the farmers.

The farmers were in general content with the project and the assistance they received from outside.

All farmers expressed to have learnt valuable new skills and knowledge, ranging from awareness and knowledge about climate change effects, over cultivation of new and old crops to financial and entrepreneurial skills.

Concerning the basic grains experiments, some farmers had been more active than others but all were interested in the outcomes and the bean Lenca Precoz and maize DICTA Lempira were of special interest. Furthermore, the farmers agreed on the necessity of future research and the general notion that it was important to maintain a diversity of genetic material in basic grains so that adaptation to the unpredictable future conditions would be easier.

The evaluation among the staff of DICTA showed that the methodology of applying a participatory innovation platform in order to transfer knowledge and technology was recognized to have high potential for the adaptation of small scale agriculture to climate change.

It was concluded that for this type of project more time and resources would be needed to be able to design trainings and the experiments in a way that allows for better learning from the farmers side. Furthermore the implementing staff is in need of more training to apply this new methodology.

POLICY IMPLICATIONS AND RECOMMENDATIONS

BASELINE STUDY

- It is important to have in mind that family farmers have different characteristics, motivations and priorities when applying CSA practices.
- It's necessary to fine-tune the intervention to the local context and especially the level of education of the farmers/participants.

INNOVATION PLATFORM

- Participatory Innovation Platforms constitute a new methodology to be applied in climate change adaptation efforts with possibilities to streamline adaptation to the pressures of climate change.
- In similar projects in the future sufficient resources need to be devoted if participatory innovation platforms are applied.
- The platform is a useful for governmental institutions to identify opportunities for improvement in current agricultural practices and to identify new practices, test them in an experimental community-based manner and receive feedback from the communities.

POLICY ANALYSIS

- It is important for governmental institutions that have a role in climate change to achieve a higher degree of coordination between operating governmental and non-governmental organizations to fully harness the benefits of resources dedicated to family farmers and agriculture.
- The demand for CSA practices from the farmers side



Fondation of the council of the Suctal Watershed, heart of the Innovation platform implemented in Honduras. Photo: M. Duron (DICTA)

should be incorporated in policies and regional extension implies a need for a new approach of governmental aid to family farmers.

CITATION

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