INFORMATIVE BULLETIN

MIS

CONSORTIUM FOR THE INTEGRATED MANAGEMENT OF SOILS IN CENTRAL AMERICA

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MIS PARTNERS MEET TO SHARE KNOWLEDGE AND REVIEW PROGRESS OF THE QUESUNGUAL PROJECT

The Quesungual Agroforestry system is a soil, water and nutrient management technology based on the maintenance of soil cover produced by crop and plant residues and pruning of trees growing sparsely under a process of natural regrowth. This alternative to slash and burn agriculture and has been a major production system to achieve food security by more than 6,000 farmer households in the Southern resource region of the Lempira Department in Honduras.

30 participants of the MIS Consortium met in Leon, Nicaragua on Feb 19-24 to share the results of the research and validation principles of the Water-CP Quesungual Project. Significant advances have been made during the last year in the biophysical and socioeconomic characterization of QSMAS research site in Honduras and the Somotillo validation site in Nicaragua.

Main findings

Output 1: Socio-economic and biophysical context of QSMAS assessed and information into database assembled

Biophisic

- ✓ A 1: 20,000 Digital Elevation model developed for the Southern Lempira region. Seventy percent of the area lies within a range of 200- 800 masl and has slopes greater than 50%.
- ✓ Management principles of QSMAS (no burning, permanent cover of the soil and management of trees) are practiced over an area of 59,475 has
- ✓ Shallow Entisols of sandy-loam texture and low levels of available P dominate landscape.
- ✓ An average family in the Lempira region consumes 2.5 ton of fuel wood per year.

Socioeconomic:

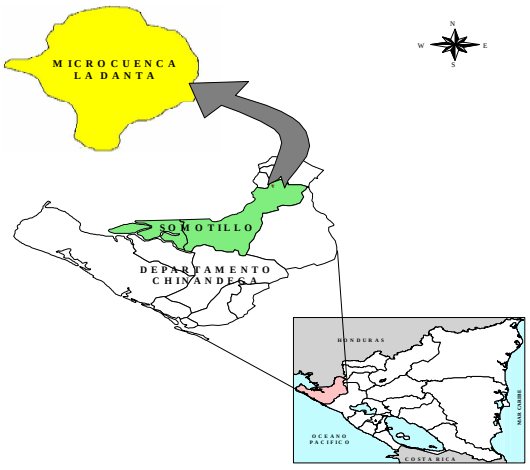
- ✓ Main driving forces behind adoption were: 1) no-burning; 2) increased water availability and crop productivity; 3) strong collective action; 4) local policies and incentives
- ✓ Farmers keep and manage trees within the QSMAS having some economical value (construction, fencing and fuel wood purposes).
- ✓ QSMAS was an entry point to improve food security and well being of farmers

Output 2: QSMAS management concepts and principles defined and relevant tools developed to monitor soil and water quality

- ✓ Above and belowground biomass of fallows before conversion to QSMAS varies between 2-6 tons/ha.

- ✓ Available P constitutes a small fraction of total P in the soil. . Most P is in the occluded pool.
- ✓ Erosion in control plots with burning reached over 37 ton/ha in a period of 12 weeks. The amount of soil loss under the SAQ was less that 2.5 ton/ha.
- ✓ Water turbidity was greater in burned plots as a result of increased runoff
- ✓ High earthworm population was observed under the Quesungual system and it was mostly localized near trees. In contrast, ant populations were not associated with the spatial distribution of trees and distributed in the rest of the area.
- ✓ Applied fertilizer increased by two-fold maize and bean yields as compared to the no-fertilized plots.
- ✓ Allometric equations developed for most common tree species in the Quesungual. This will allow to estimate carbon accumulation in the biomass
- ✓ The system is a net sink for methane and produce N2O emissions

Output 3: Potential areas suitable to QSMAS evaluated, analyzed and documented



Location of the Validation site in "La Danta" watershed in Somotillo, Nicaragua

- ✓ La Danta watershed in Somotillo selected as the validation site of QSMAS principles in Nicaragua.
- ✓ Edaphic and floristic characteristics of the validation site in Somotillo are similar to Lempira region. However, it is a drier region.
- ✓ Nicaraguan farmers are comparing the effect of soil cover and pruned tress against their traditional system with burning.
- ✓ Participating farmers are expanding the QSMAS beyond the validation plots.
- ✓ Exchange of ideas between farmers is speeding up the validation process. Farmers from other regions of Nicaragua are beginning to establish the system in their own farms

Output 4: Tools for dissemination, adaptation and promotion of the QSMAS management strategies developed

- ✓ Strategies to reach different audiences (farmers, extension agents, policy makers) at different levels (household, community and watershed) using different media (presentations, videos, radio broadcasting, etc).

Validation process

The progress in the validation site in Nicaragua is impressive. Participating farmers are strongly involved in the establishment and evaluation of the management principles of the system in their own farm-plots. They are also excited to extend the system in their own farms and beyond of the validation site in Somotillo. This has been the result of the intensive exchange of

ideas between farmers of Honduras and Nicaragua promoted by the project and supported by INTA and UNA in Nicaragua.

The way ahead

Research activities during the next 18 months will be centered on:

- ✓ Determining soil-water fluxes, nutrient dynamics, biological activity and gas flux as affected by management variables included in the study.
- ✓ Validation if QSMAS principles in the Colombian hillsides
- ✓ Identification of potential sites for extrapolation of QSMAS in Latin America
- ✓ Develop databases and tools to share knowledge with stakeholders
- ✓ Strength local capacity of conducting research by supporting 2 PhD, four Master and six BSc thesis

New ideas for proposals for the second phase of the project

- ✓ Extrapolation of SAQ to similar regions in Africa and Asia
- ✓ Strategies to increase water productivity through intensification and diversification of agricultural production in the SAQ
- ✓ Potential of QSMAS for restoring degraded lands
- ✓ Assessment of environmental services in the QSMAS
- ✓ Development of decision trees to support adoption of QSMAS.