

 **UNIVERSIDAD DE PINAR DEL RÍO**
“Hermanos Saíz Montes de Oca”
Centro de Estudio de Medio Ambiente y Recursos Naturales
Cemarna 



First Joint Workshop

**“Biodiversity in agricultural and forestry systems of Ecuador:
experiences for sustainability”**

Title: Crop diversification and traditional technologies in family farming for sustainability, in Pinar del Río, Cuba.






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 **Introduction** 

For many years agriculture was considered to be an activity that does not cause impacts or negative effects on the environment.

This idea changed greatly when it was demonstrated that agricultural production processes cause serious damage to the environment and its impact is greater than certain industrial sectors.



Problem


Agricultural productions based on the agro industrial agriculture model, causes serious impacts to the environment and limits the sustainability of the productive processes of agriculture in the Province of Pinar del Río, Cuba.



The collage consists of six images: 1. A red tractor plowing a field. 2. A large, deep erosion gully cutting through a field. 3. A person in a hat and green shirt standing in a field. 4. A field of green tobacco plants. 5. A large field of bare, brown soil. 6. A satellite map showing a rural area with roads and fields.

Objective:

Promote the sustainability of Family Farming Systems, based on the diversification of crops and traditional technologies that strengthen their capacity to face climate change.



The collage consists of three images: 1. A field with rows of crops, possibly tobacco, in a hilly area. 2. A field of green tobacco plants. 3. A field with a mix of crops and vegetation, possibly a traditional farming system.

Development:
To locate where the investigation is conducted

It works in farms and agricultural companies in the Municipalities:





- ✓ Minas de Matahambre
- ✓ La Palma
- ✓ Consolación del Sur
- ✓ Guane
- ✓ Viñales

I. Problem diagnosis stage:
Impact assessment on the soil resource.

- ✓ 85% of cultivable soils show signs of erosion
- ✓ Application of chemical fertilizers per unit area of **160.7 kg ha⁻¹**
- ✓ Application of fertilizers N per unit area of **63.3 kg ha⁻¹**
- ✓ Application of insecticides by area **15.9 kg ha⁻¹**
- ✓ Tillage of soil with inappropriate technologies
- ✓ Low organic matter content (0,8 a 2.0 %)
- ✓ Soil carbon loss

Impact on biodiversity and landscape in the territory.

- ✓ Biodiversity Degradation
- ✓ Deterioration of the Rural landscape
- ✓ Monoculture










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Impact of the technologies.

- ✓ High Dependence on External Inputs
 - Tractors
 - Implements
 - Fuels and lubricants
 - Tires and spare parts

- ✓ They became unsustainable technologies over time

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Agricultural traditions are forgotten



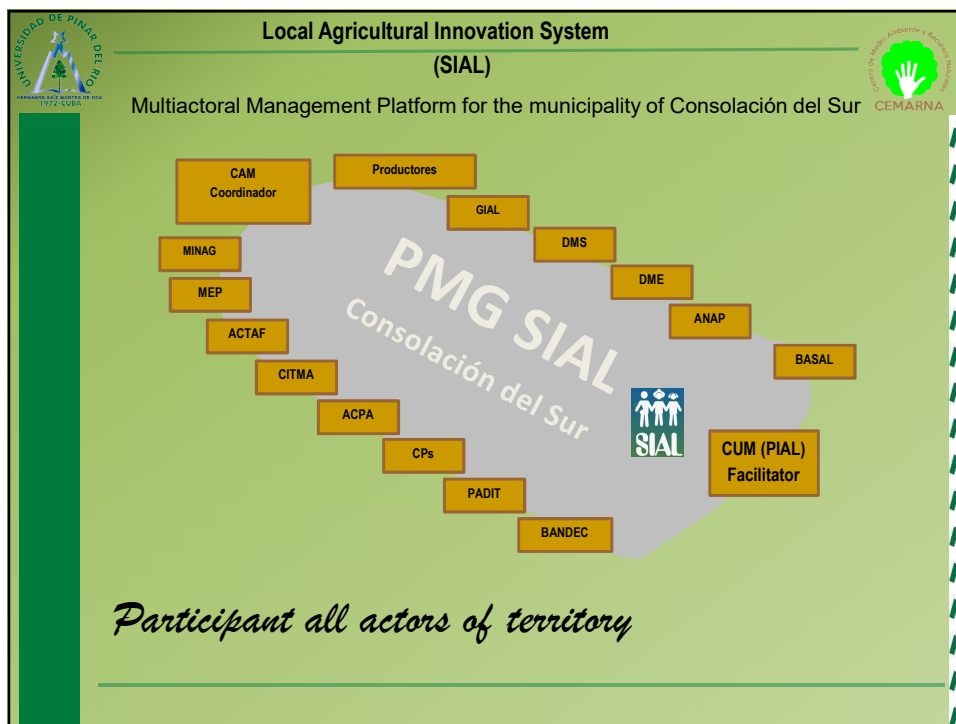
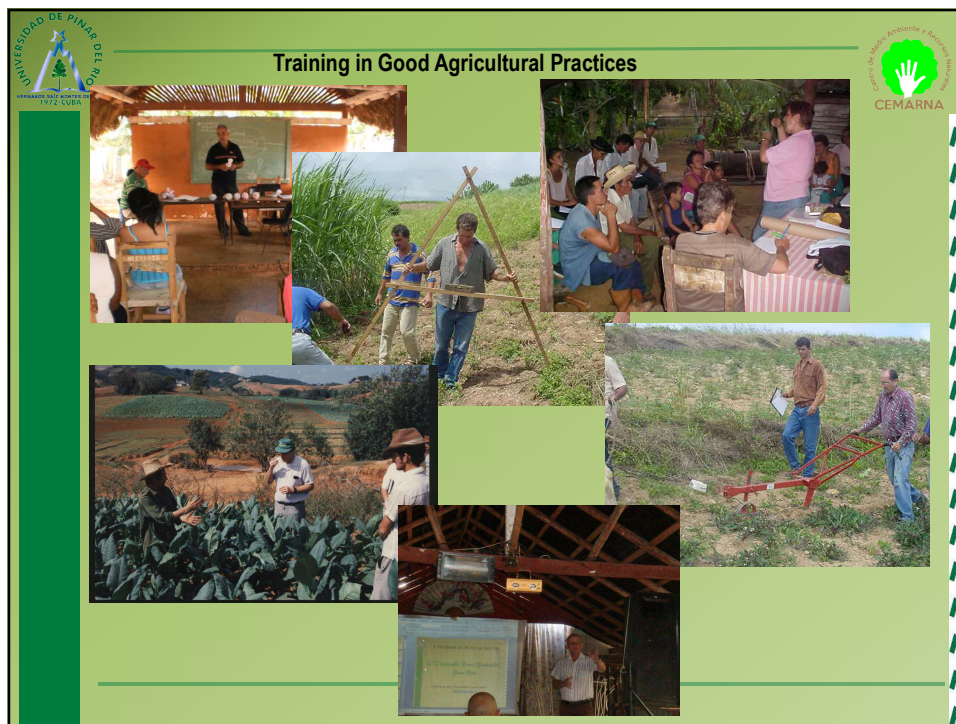
But,the team oxen following walking
Artemio Cruz

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II. Awareness and capacity building stage:
Promote an environmental culture





III. Action implementation stage:

Spatial planning of the estate



Ecological design of farms

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Soil Conservation Management

- ✓ Soil conservation measures
- ✓ Live barriers.
- ✓ Cover crops.
- ✓ Contour crop
- ✓ Replace chemical fertilizer with organic



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Animal Traction Management






Traditional Implements



Improved tools







Conservation Agriculture Technologies






Tobacco Growing
San Juan y Martinez

- ✓ Carbon retention in the soil.
- ✓ Better soil and water management.
- ✓ Prevents soil erosion.
- ✓ Greater moisture retention.



Bean and Corn
CCS Camilo Cienfuegos
La Palma.








Conclusions

Agriculture through its production processes generates environmental impacts that cause global warming, this situation motivates the need to deepen the factors that affect this problem to cushion the effects of Climate Change

For many years it was considered that the interests of agriculture and environmental protection were opposed; but at present it is possible to reconcile both objectives.


If we are able to foster an environmental culture in family agricultural producers, through a solid formation of responsible attitudes towards the environment, we will achieve a sustainable and environmentally friendly agricultural production..

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*"Without oxen the granary is empty, . . .
but with the strength of the ox there is an abundance of bread"*

Proverb 4. Chapter 14





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Muchas Gracias





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