From a conventional agriculture system to a system of self sustaining management practices: the case of Cuba

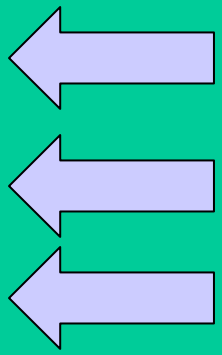
General information:

- This study has been developed in Cuba and Italy from 1999 to 2000 working with 3 cooperatives (CPA).
- For this reason this case study represents just a part of agricultural reality of Cuba.

In general there are five kinds of producers that differ from each other principally in the types of land tenure and socio-economic relations.

The forms of organization of production in Cuba are:

- State enterprises
- UBPC
- CPA
- CCS
- dispersed farmers.



COOPERATIVES

❖CPA (Cooperativa de Produccion Agropequaria) ~ *Cooperative for Agricultural Production*:

These cooperatives have attained certain importance over the last ten years because the represent a link between the state and private sector

Methodology:

- Definition of the main objective: describing and quantifying (mainly from a socio economic point of view) the impacts occurred in the three selected CPA where alternative practices were introduced.

- Preliminary visits to CPA and general context understanding

- Study of the CPA's information collecting systems

- Elaboration of proper indicators to asses the impact on the CPA

- Direct acquisition of information in the cooperatives (CPA)

- Study and processing of information collected

Main problems:

- Moving and visiting the CPAs:
  - Technical moving problem
  - Problems related with the study objectives (depending on the political situation it is not easy to recollect informations and date usefull for an independent rapresentation of the CPA activities and results)

- Incomplete CPA collection of historical and information data

A Quick Overview of the CPA's

- CROPS: roots and tubers, vegetables, grains and fruit (garlic, yucca, sweet potato, onion, tomatoes, corn, pepper, squash, bean, carrot, bananas) and sugar cane

- Members: around 180 each CPA
- Total area: around 500 ha
- Location: Havana, Matanzas (200 km from Habana, Ciego de Avila (400 km de Habana)

Features of the new model of production

Production and implementation of biological pesticides. These are mainly micoorganisms and beneficial insects (*Bacillus thuringiensis, Verticillium lecani, Beauberia bassiana, Lixophaga diatraeae, Trichograma spp).* While they are produced in biolaboratories (approximately 220) all over the country, their availability is not uniform throughout the country.

Production and implementation of biological antiparasitics. Many experiments have been carried out thus far using a variety of species: *Nicotiana tabacum, Chrysanthemum cinese, Tagetes erecta Solanum globiferum, Tephrosia cinerea, Anona squamosa* among others. The most interesting results thus far have been obtained working on *Azadirachta indaca* (Neem).

Production and implementation of biological fertilizers. The most common biofertilizer is worm castings and rhizobium bacteria. One of the new techniques that is being researched is attempting to introduce bacteria to the soil that have the capacity to make phosphorous available for the plants

Technical changes in agronomic management and implementation of resources.

Technical changes in agronomic management and implementation of resources. There is a diversity of techniques that, on one hand, stem from the limitations of the resources (chemical inputs) and, on the other hand, are a result of proper cooperative research plans.

These techniques include:

a) more intensive crops rotation
b) redesigning crops plans due to chemical resources availability (for example, there is an increase of crops – sugarcane and potatoes – which are supported by State Programs through making particular chemical inputs available, while paradoxically there is also an increase of crop not as reliant on inputs)
c) introducing new varieties (with a particular increase in tolerant and resistant varieties, where possible)
d) replacing alternative energy, such as animal traction
e) using the minimum quantity biological substitution inputs
f) new strategies to increase personal investment in the land

Reorganizing research and extension programs for the diffusion of new technologies throughout the country. The mission of INISAV (National Institute for Research on Plant Health) is to research biological pesticides. It is coordinated by CNSV (National Institute for Plants Patology) and it is closely linked with 14 Provincial Departments, 14 Laboratories and 62 Stations. INS (National Institute for Soil) and INIFAT (National Institute for Tropical Agriculture) are research associates in this national biological program. At the field level the largest cooperatives play a critical role in organizing participatory meetings and practical training.

Conclusions:

Alternative techniques are not applied to the most important or “strategic” (in order to feed the population) crops (e.g. potatoes, sugar cane).
It is striking how the conversion process is based primarily on the substitution of biological inputs for chemical inputs without wholly incorporating agroecological practices.
The transition from the L1 to L2 is not enough to guarantee a sustainable agriculture system. In fact, the passage from the level 2 to the level 3 would allow farms to be stable enough to challenge and compete with agroindustrial producers without requiring a return to chemical inputs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