

The Process of Agroecological Transition in two Andalusian Regions: Antequera (Malaga) and Campina Baja (Cordoba)

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Introduction

The study we present here forms a part of the research project "On-Farm Research, Development and Evaluation of Organic Farming Systems: The role of Livestock and Agroforestry". This project is financed by the European Union and the Spanish State, and involves five European research centers: The Division of Ecological Agriculture (University of Kassel, Germany); The Laboratory of Ecology and Environmental Protection (Aristotelian University of Thessaloniki, Greece); The Institute Supérieur D'Agriculture Rhones-Alpes (France); Elm Farm Research Center (United Kingdom); and The Instituto de Sociología y Estudios Campesinos (University of Córdoba, Spain). The study period began in October 1993, and the project is funded for three years.

From European Union perspective, the Andalusian part of the project focuses on the process of agroecological transition in horticultural systems. Our research will provide ecological criteria for the design of alternative farming systems in two Andalusian regions: Antequera (Malaga) and Campiña Baja (Cordoba). Sevilla (1995) establishes a hierarchical framework for the analysis of various levels at which agroecological transition can be observed. For the present study we decided to research transition as it is experienced at the level of the basic economic and social unit of production, this is, the farm level. The central objective of the project is to articulate an agroecological network of farmers at the regional level, in order a) to encourage their capacity to re-invent sound agricultural practices using elements of traditional agricultural systems and b) to organize and control exchange mechanisms for inputs and surplus production. Thus the project encompasses both technical and ethical considerations.

A Theoretical Note

The theoretical framework we use includes a systematic perspective and an holistic approach to the ecological analysis of processes of agroecological transition at the farm level. Our research takes account of economic and, especially, social components of the transition process and views agriculture as the product of historical coevolution between people and nature (Altieri, 1987; Sevilla Guzmán and González de Molina, 1993). The agroecological transition to sound agriculture implies the substitution of polluting technologies which depend on industrial capital (chemicals and cultivation techniques such as deep ploughing, which degrade the environment), by others more benign products and techniques such as organic fertilizers, biological control of pest and diseases, composting, rotations, genetic diversity, etc.). These technologies require low levels of capital and are locally highly accessible. They

permit both the maintenance of biodiversity and the productive capacity of the ecosystem over the long term. However, the transition could be achieved in a variety of ways, all of which would vary with respect to three basic components or sub-systems: **ecological** (e.g. the initial level of "artificialization" or industrialisation of the agroecosystem); **economic** (markets structure); and **social** (reproduction strategy of the domestic group).

Methodological Approach

The methodology adopted encompasses a dual approach which links an initial stage of participant observation (PO) with a second stage of participatory action research (PAR). The methodological strategy we devised is based upon the notion that researchers are integral elements of the processes that define the reality they will be studying. It presupposes a) the inclusion of the researcher as an important part of the world they are studying and, b) a profound interaction with the local social actors. It is important to highlight several characteristics of PAR that are, in our opinion, basic to the development of the project. First, the legitimacy of the researchers must be established from the outset of the research process. This is achieved, on the one hand, through the formation of symmetrical relationships with the farmers and, on the other hand, as a result of the previous accord established between scientists and the farmers. Second, the research agenda, as well as the possible strategies and solutions that will be developed and employed to deal with the problems which arise during the project are established on the basis of agreement between the farmers and researchers, such that both groups assume clearly identified research and action responsibilities. Thirdly, researchers must, in many cases, act as a catalyst and orient their activities towards the development of "human capital", not only by sharing technical and economical knowledge, but also through the experience of participating in collective social action (Park, 1992:142). Finally, the methodology has a dynamic character, which provides researchers with a continuous feedback, thus permitting a rapid re-orientation of research.

Results

The farmers involved in the project have different characteristics: they manage farms of varying sizes (from 0.5 ha to more than 100 ha); their involvement in farming activities is also variable (from part-time to full-time); and we also find diverse forms of organisation for production (from family to co-operative farming). The diversity of the nine farms we are studying has both advantages and disadvantages (associated with the processes of agroecological transition in a great variety of conditions) for our analysis, which is carried out on the basis of the three components we mentioned previously: ecological, economic and social.

Ecological component

At the agroecosystem level, we have attempted to develop an understanding of endogenous knowledge in order to employ it in the design of transition strategies at the agronomic level. We intend to design, in conjunction with the farmers, actions to identify and overcome the factors which hinder the process of agroecological transition. This process means, on the one hand, increasing the functional diversity of systems' components, to make sure that each component has a variety of functions, and further, that each function is realised by several

components (Altieri, 1987). On the other hand, it also envisages the recycling and to re-arranging of energy, materials and information within the system.

Experience gained from other transition processes (Andrews et al., 1990; Labrador Moreno, 1990; Lampkin, 1990; Liebhardt et al., 1989; MacRae et al., 1990; Maire et al., 1990; Patriquin et al., 1986 and Sivapalan et al., 1993), as well as the problematic of horticultural production in the areas that we are studying, have led us to assess a series of indicators to understand and describe the tendencies of the systems during the transition process. With respect to the soil, we have been following the evolution of chemical parameters (mainly pH, salinity and phosphate content) and biological parameters (the population dynamics of both crop pests and beneficial insects). With respect to the aerial domain we have been assessing weed flora (using indicators like global infestation, abundance index, cover index, phenological stage of weed development with respect to the sowing date). In addition we have also followed other parameters including: damage caused by pests, yields, income and expenditure.

To make a global assessment of the initial situation of each farm, we used the technique of "Clinical Diagnosis" (Gastó, 1987 and 1993). In terms of actions, it was considered important to generate a stable ecological infrastructure; this is composed by trees, bushes and herbaceous plants, which serve as elements of functional diversity. At the same time, we have initiated a stockbreeding experiment to generate more income and, moreover, to recycle the crop residues by producing manure. As the research is essentially iterative and participatory, the occurrence of the first dysfunction within the systems (for example weed invasions) led us to adapt the research to the resolution required to confront the problems which are arising.

Economic component

In the economic sphere our PAR focused on encouraging local markets and generating alternative commercial forms, which avoid the loss of added value and thus constitute an element for rural development. The initial stages of our research always take a PO approach, which allows the researchers to understand the economic strategy and situation of each production unit: destination of production (auto-consumption, commercialisation, export, etc.); access to the market (with or without intermediaries, forms of payment, prices...), etc., making a point of discussing the advantages and disadvantages associated to these conditions and strategies. These discussions led to the development of a variety of proposals for action, which have been adopted to varying degrees, according to the specific situation of each participant, especially their family reproduction strategies and their consumption strategies which are oriented towards developing the capacity to maintain control over commercial networks and thereby avoid the loss of the added value. This can be done through auto-consumption, linking with local shops, or orientation to "niche markets", which are specifically dedicated to organic products.

Apart from the generation of markets, we used the data which were produced to generate systematic information about organic production costs. The objective of this work is to identify possible points where costs are increasing (fertilisation with manure, manual weeding...) and to assess where these costs are limiting the profitability of organic farming, the possibility of reducing them through the employment of alternative practices.

Social component

Participatory Action Research constitutes a catalytic action in the social transformation processes. Action at this level encourages the creation of discussion spaces, and knowledge sharing, which permit, on the one hand, a more profound understanding of the causes of the current agrarian crisis (economic as well as social or ecological), from an historical perspective. And, on the other hand, promoting progress in the generation of concrete and feasible actions as essential elements in the process of endogenous development.

Conclusion

The study of these three basic components (ecological, economic and social) has provided us with the basic elements needed to approach the design of sustainable agroecological systems.

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