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Social Enquiry and the Policy Relevant Exploration of Agricultural Systems

M. Lemon and R. Seaton

Abstract

The relationship between agriculture and the natural environment is determined by the physical characteristics of that environment and the decisions which affect how it is managed. However, as interdisciplinary method becomes more prevalent it is increasingly important to consider the means by which the relevant criteria to represent a decision issue, and the techniques to obtain information about them, are selected. This paper will propose that a range of social enquiry techniques can make a significant contribution to the policy relevant diagnosis of agri-environmental issues through the representation of those issues as they are perceived at the local level. It will also suggest that such techniques can supply data about changes in the natural system that is not readily available from more technical natural science procedures, albeit at a far lower level of definition. A case study into the processes of resource degradation in the Argolid region of the Peloponnese in Southern Greece has been used to exemplify this argument.

Introduction

Transdisciplinary studies which relate to agriculture and the environment have emerged out of a growing acceptance that 'real world' issues are complex and do not conform to analysis or representation by single disciplines. Such issues need to be constructed as meta-problems which transcend existing disciplinary boundaries and as such are not easy to resolve through single disciplinary approaches or within institutional frameworks (Roome, 1993). Policy relevant research is essentially a diagnostic process which is oriented towards the structuring and systemic representation of an issue prior to the selection of the subject matter for more detailed investigation, and the theoretical and methodological tools necessary to pursue this. Single discipline studies inevitably use their own classes of phenomena as frames of reference for the determination of relevant information. These often exclude concepts such as scale, hierarchy and perspective which are a major issue in transdisciplinary investigation.

Some progress has already been made towards the integration of biophysical and socio-economic agricultural subsystems (Park and Seaton, 1995). This tends to have emerged from agricultural systems thinking and a recognition that the decision space within which farmers operate is not restricted to the physical characteristics of the land they manage. In contrast, criticism has been levelled at the social science community for devoting too much attention to paradigms, intellectual shifts and ideological studies (Molnar et al. 1992). Social enquiry, therefore, can contribute to agricultural science through a range of analytical and conceptual devices (i.e. from systems thinking and ethnography) and through the use of specific tools and techniques for data acquisition (i.e. elicitation techniques). This contribution can take a number of forms:

1. The elicitation of those attributes and processes that help to define an issue or system of interest and the investigation of how these are configured to determine the range of options that are perceived by a hierarchy of decision makers.
2. The establishment of a typology of decision makers (farmers in this example) which can inform about the range of responses to those options and the thresholds at which decisions are made.
3. The acquisition of data about the use of natural resources and the extent and nature of physical transformations.

The first two points form the basis for this paper, however, it is worthwhile recording that social enquiry techniques can be employed to acquire information about natural phenomena. This is often neglected by the natural sciences and undervalued by the social sciences (Lemon et al., 1994). Measurement within natural science is constrained by the available knowledge and technology and thereby finance. This in turn restricts the ability to represent spatial variation, and once a natural process has been identified as significant, to obtain historical data about it. Therefore a complementarity is evident between the acquisition of relatively few 'technical' measurements which cannot readily inform about how that transformation contributes to the wider picture and data of less resolution which informs about that wider canvas (Conway, 1985). While it is important to recognise that farmers respond to a situation as they see it they are also a valuable source of information about how, and to what extent, natural resources are used and the subsequent impacts of that activity on those resources.

Background to agriculture and natural resource degradation in the Argolid[1]

The Argolid Plain is situated in the Peloponnese region of Greece, approximately 150 kilometres south-west of Athens. The area is dominated by irrigated agriculture which accounts for 89% of groundwater compared with 6% in total for domestic consumption and the balance being used for other industrial purposes. Over the past fifty years there has been a movement away from a more diverse rain fed farming system producing for local markets and domestic consumption towards the mono-cropping of irrigated fruit crops, in particular citrus (orange trees). The market for much of this produce is external to the area and is underpinned by a range of price supports and subsidies. This intensification of agriculture, with the accompanying increase in mechanisation and fertiliser and pesticide use is not sustainable and has led to the degradation of soil and water resources. This degradation has taken the form of water depletion with bore-holes in the area reaching 400 metres in depth and with increased uncertainty about finding water. There has also been progressive salinisation due to the intrusion of sea water as ground water levels have dropped and increasing problems with frost which reduces production levels and ultimately threatens the trees themselves.

The response to this degradation, advocated by the scientific community and expressed through policies for remedial activity, has been to introduce further technologies (air mixers to protect against frost, deeper drilling capacity and infrastructure for water transportation) to

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perpetuate current production rather than to alter agricultural practice in an attempt to reduce water use. In effect the area as a whole is caught in a technological spiral with relatively little understanding about the social and cultural criteria that may constrain, or support, the adoption of more sustainable forms of farm practice. In other words the success of any remedial programme is dependent upon an understanding of the receptivity (Seaton and Cordey Hayes, 1993) of farmers to different options. It is here that natural science and social enquiry need each other. Comprehending the physical characteristics of different crops (water requirements, vulnerability to pests and climate etc.) must be related to the social criteria that affect its viability as a cropping option (commitment in time and capital and knowledge requirements etc.) and vice versa.

Diagnosing a policy relevant issue and the relevant system of interest

The process of resource degradation in the Argolid highlights the inseparability of social and natural phenomena and the need for a conceptual framework for framing issues and specifying the information requirements related to them. The need for such a frame assumes that there is seldom a consensus about what constitutes an issue, its magnitude, its evolution and what remedial options exist. For example there was not a homogeneous perception about the issue of degradation in the Argolid. The farmers refer to the 'problem' of water when, in quality and quantity, it becomes more difficult to obtain for irrigation. On the other hand hydrologists may refer to a 'problem' which relates the demand for water to the depth, and salt content, of the aquifers. A soil specialist, however, may perceive a 'problem' when the soil deteriorates in its ability to support vegetation and an agronomist with the loss of ability to grow a particular crop.

A broad systemic picture of the perceived processes, agencies and interactions relating to an issue (agricultural production and degradation) can be obtained from semi-structured interviews with key actors (i.e. those involved in agricultural production in the area, farmers, agronomists, drillers, scientists). While the initial focus should be on the issues of concern the processes to which linkages are perceived need not be restricted either by issue, time or location. For example the perceived relationship between crop choice (farm level), the provision of information from the Service of Agriculture (regional) and price guarantees from the European Union. The accompanying table shows how this systemic picture translates into the socio-economic and physical dimensions that influence farming decisions. These represent the basic attributes which, under various configurations, determine the options that are open to farmers across the region. The term dimension was chosen specifically to represent a range within each attribute (i.e. from high status attached to farming to the work being held in low social esteem) as well as the possible combinations between them.

Table 1: Dimensions of farming option space in the Argolid Valley.

Socio-economic dimensions	***Physical dimensions***
Reliance upon seasonal labour	Soil quality
Capital/labour investment	Topography
Labour: Technology ratio on farm	Micro climate
Social acceptability of farming	Availability of water
Adoption of local, external markets	Quality of water
Level of self-sufficiency	Productive level of crops
Variety of crops grown	Crop vulnerability
Economic organisation	***Information-public administration***
Price support and subsidies	Level of infrastructure
Marketing efficiency (co-operatives, local market activity)	Effectiveness of agricultural extension service
Water and technology prices	Patronage-political involvement

Typology of decision makers

Combinations of these socio-economic and physical dimensions have been used as the basis for a broad typology of farmers. This provides an insight into the range of possible responses to policy options (i.e. price support and subsidy of crops, water pricing and rationing, technological and managerial support). It is important to note that, for reasons of space, this typology has been presented without reference to its spatial distribution. If such groupings were scattered evenly across the landscape then such a typology would be of far less interest. However, because a spatial structure is apparent (see Allen et.al. 1994) the implications for policy exploration, at a local level, are far greater.

The first group are predominantly monocroppers of irrigated citrus trees with high productivity per unit and the adoption of the European Union price support system rather than local markets. A high level of technology is employed to offset the effects of degradation. Primary employment and investment are outside of agriculture and the ability to farm in a more diverse way is constrained by limited family and personal commitment to working the land. The low status accredited to farming within this group is further exemplified by the tendency for farm children to enter higher education and move into occupations other than farming. Due to the existence of second incomes the farming behaviour of this group changes little with changes in orange prices. They are thereby able to withstand price reductions and as such are less vulnerable, in economic terms, to degrading natural resources. They are however less flexible with regard to labour intensive cropping options.

The second group have larger farms with limited crop variety and low levels of technological investment to combat the effects of degradation. There is low productivity due to water degradation and poor soil in the areas that they farm. These farmers are therefore constrained by the need to generate additional income outside of agriculture, a factor which also restricts the potential for children to enter farming. The external income (i.e. through tourism) can become essential to the household budget and thereby lead to a further decrease in the time allocated to farming. These factors have restricted the ability of this group to adopt cropping options which require high levels of labour or reliable, good quality natural resources.

The third group have a greater diversity in their crops and the markets to which they sell. A high level of agricultural investment is made both through personal (family) commitment and expenditure on technology. This commitment is manifest through the supportive role played by the extended family and the tendency for children to enter farming on leaving high school. There is considerable flexibility in the type of farming undertaken by this group due to the level of commitment to farming, the use of 'hidden labour' for marketing and work in the field and the domestic consumption of some crops (vines, cereals etc.).

Conclusions

It has been argued that natural science has begun to recognise that change cannot be effected within farming systems simply through an improved understanding of the characteristics of physical phenomena. Equivalent insights into the basis for decision making by farmers are also necessary. Social science has been slow to take up this mantle, preferring to concentrate on theoretical issues rather than interaction with agricultural science and farming communities. It is only through this interaction that a systemic picture can be elicited which represents the attributes and processes of production and degradation and thereby the range of options that are realistically open to local decision makers and on which viable policy can be formulated. In addition, more structured enquiry techniques can also provide data about changes in physical systems that can provide an overview which is not available to natural science.

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