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Exploring environmental perspectives in lowland agriculture: a Q methodology study in East Anglia, UK

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Abstract

The role of agriculture in rural areas is changing significantly in Europe, with environmental protection and enhancement, and provision of amenity and recreation increasingly emphasized both in public debate and in new policy initiatives. Faced by these shifting priorities, it is increasingly important to understand how farmers themselves perceive their roles in relation to environmental management in particular. As recent research in New Institutional Economics has shown [Frey, B.S., 1997. *Not Just for the Money*. Edward Elgar, Cheltenham.], policy assumptions and instruments that are at odds with the underlying motivations of agents may actually reduce achievement of policy objectives if they act to degrade beneficial norms or alter the basis on which agents make choices. Understanding how farmers conceive of their environmental rights and responsibilities is therefore important in helping to design agri-environmental measures that can complement, rather than conflict, with the underlying normative assumptions that farmers themselves hold. This study employs Q methodology to investigate the perceptual frameworks of a sample of UK arable and mixed lowland farmers regarding the appropriate way in which to approach the environmental management of agricultural land. The Q analysis identifies five distinct perspectives on notions of agricultural stewardship; we term these Environmentalists, Progressives, Commodity Conservationists, Jeffersonians and Yeomen. We discuss the main characteristics of these groups and comment on these results in the context of current UK agri-environmental policy, which is changing both the presumptions of farmers' entitlements to agricultural payments, and the expectations pertaining to farmers in relation to environmental responsibilities. In conclusion, we suggest that Q methodology can be a valuable way of demonstrating the nature of the mental frameworks of actors in a particular context and this enables us to formulate some important questions regarding the motivations of land managers in the context of a rapidly changing rural policy.

Keywords

Q methodology; Farming; Environmental policy; Attitudes; Stewardship

1 - Introduction

The last 20 years have seen an increasing interest among policymakers in the quality of the rural environment considered as a resource in its own right, in addition to its role in food and fibre production. The reasons underlying this shift in outlook are varied, ranging from observations of the effects of technical changes in the practice of agriculture itself to the declining political power exercised by the farming lobby in the shaping of rural policy (Lowe et al., 1994). The latest round of reforms of the Common Agricultural Policy (CAP), especially the decoupling of farm payments and the introduction of cross-compliance, has heralded a further significant shift in the situation of farmers, and the expectations that are placed upon them in relation to aspects of environmental management in particular (ECDGA, 2004). Although it can be argued that agriculture in Europe still retains a disproportionately favourable policy regime in comparison with other industries, the previous freedoms enjoyed by land managers are being gradually curtailed in favour of greater regulated control of many aspects of the farming enterprise (Dwyer and Hodge, 2001). Outside of reforms at the European level, increasing recreational access to rural land is another example of a further demand being placed on UK land managers by sections of wider society and receiving support from government (Curry and Ravenscroft, 2001).

The arguments supporting this realignment of agricultural policy away from food production towards a greater diversity of rural outputs are based principally on increasing responsiveness to public preferences for more conservation, amenity and recreation goods (CRER, 2002). The factors that are enabling this particular set of preferences to gain recognition and support through the policy process are also mixed, arising from a combination of lobbying by special interest groups, movements of counter-urbanisation leading to shifting interests in land among rural populations themselves, and opportunities for channeling agricultural support through environmental 'Green Box' options in tandem with international pressure for liberalizing agricultural markets (EC-DGA, 2004).

In England, these broad shifts in expectations for rural areas are being matched by a suite of new policy instruments that span the traditional range of intervention mechanisms: economic incentives in the form of both cross compliance conditions and targeted direct payments for environmental activities on agricultural land (DEFRA, 2004); command and control approaches with increasing environmental quality standards, for example on factors such as nutrient application levels (RPA,

2003); and moral suasion in the form of advertising, information and advice targeted at improving farmers' knowledge and awareness of environmental issues (DEFRA, 2002). Different combinations of these measures have been adopted across the states of the European Union but the end result is an increasing realignment in the policy objectives for farming to a more multifunctional environment. In some circles, it has been argued that this represents a shift to a 'post-productivist' conception of the rural environment, in contrast to the productivist focus that was dominant for the 30 years following the Second World War (Ilbery and Bowler, 1998).

Against this shifting policy backdrop, the critical issue remains of how land managers themselves will respond to this suite of new environmental demands and new policy options. In particular, there is concern to achieve those public benefits that are demanded from land managers (in terms of environmental amenity provision) at minimum cost. From a rational choice perspective, this problem is one of determining the appropriate level and combination of incentives and regulations to achieve any given level of benefits (Brotherton, 1989, Roberts et al., 1996 and Cary and Wilkinson, 1997). The success of such policies is dependent on farmers' willingness to respond to incentives for shifting land from one purpose to another, and the levels at which incentives and their monitoring and enforcement costs are set. So called proactive environmental activities (for example leading to enhanced landscapes or biodiversity) have typically been assumed to warrant incentives, whereas avoidance of environmental harms, such as nutrient-based pollution, are considered the appropriate subject of direct regulation (CRER, 2002). These policy principles themselves reflect particular prior assumptions about the distribution of property rights across different dimensions of the rural environment (Bromley and Hodge, 1990).

Recent research on the boundaries of new institutional economics (Frey, 1997 and Ben-Ner and Putterman, 1998) has challenged the assumption that the potential effect of policy instruments on behaviour can be analysed in isolation from their impacts on the underlying preferences and motivations of agents. In particular, it is becoming clear that internal motivational assumptions cannot always be considered as stable when the external framing of choice situations changes (Frey, 1994) and, moreover, norm-governed behaviour may be better understood as the product of internalized rules partially constructed by cues in the external choice environment rather than as preferences or tastes 'taken as given' by the researcher (Bowles, 1998).

From this perspective, understanding the basic motivations and the normative assumptions of duties and rights that farmers hold is therefore an important component of understanding how they may

respond to new policies and, in addition, how these motivations and assumptions are dependent on external 'framing' factors such as those provided by particular policy instruments is a further issue of significant interest. Understanding more clearly the normative frameworks of farmers can thereby help to anticipate in what ways policy may be received positively and in what ways it runs contrary to farmers' core objectives and beliefs.

From a neo-classical perspective, environmental goods have tended to be seen as a by-product of production-oriented decisions based on more or less rational profit-maximisation motives, or else more recently they enter into the farmer's optimizing framework in the form of financial incentives available through agri-environmental schemes, thus expanding the domain of profit-based decision-making (Whitby, 1994). In contrast, more heterodox approaches have tended to see them either as mixed goods, bringing benefits to farmers of a non-monetary kind (e.g. Weaver, 1996), or in some cases as products of principally moral rather than preferential choices over the appropriate management of land (Colman, 1994). These latter motivations extend beyond simple preferences for environmental amenities onfarm, to encompass normative concerns with 'good stewardship' and the practice of agriculture which are better represented as 'commitments' rather than simply tastes (Sen, 1987). In this sense, they are determined by views of how agriculture should be practiced and the research challenge is one of describing perceptual frameworks or paradigmatic understandings of the purpose and practice of farming, in which complex frames of reference and identity underlie choices (Morris and Andrews, 1997).

The purpose of the present study is to describe the range of perceptual frameworks that exist among predominantly arable farmers in the Eastern region of the UK with a particular emphasis on their views of two related areas: environmental management and environmental policy. Using a semi-structured survey method—Q methodology—we describe the significant differences in viewpoints uncovered by the study, which reveal distinctive sub-sections of the farming community, each characterized by a different understandings of the relationship between agricultural practice and the appropriate division of responsibility for environmental management between the individual and the state. The next section reviews some of the past literature relevant to studies of perceptual frameworks in agriculture and Section 3 describes the particular approach taken in this study. Section 4 explains the five distinctive perspectives arising out of the analysis and Section 5 discusses these in relation to their policy implications in particular. We then draw some conclusions in Section 6.

2 - Perceptual frameworks in farming

Probably the best known work on defining perceptual frames of reference in agriculture has been Beus and Dunlap, 1991, Beus and Dunlap, 1994a and Beus and Dunlap, 1994b development of categories and an associated attitudinal scale to measure adherence to the Alternative-Conventional Agricultural Paradigm. These paradigmatic perspectives define the set of mental constructs against which and by which certain actual farming styles, practices and policies, including views on stewardship, are evaluated. They provide both a perceptual framework, which justifies certain rural policies, and establish a rationale for rural governance in which for example freedom from interference has a key role. Beus and Dunlap situate their own analysis with reference to the earlier critical dichotomy advanced by Smith (1982), which identifies two general models of American agrarianism: Yankee and Southern. The Yankee model is essentially progressive, outwardlooking, capitalist and production-oriented. Under this model, a farmer's worth is essentially tied to his productive abilities. In contrast, the Southern style emphasizes 'moral excellence, which is attained, in part, by living close to nature, abiding by tradition and recognizing one's place in the community. Indeed, one's identity and worth come from properly filling one's role in the family, community and in nature' (Beus and Dunlap, 1994a, p. 466).

Tracing these models back to their precursors, Beus and Dunlap situate the Yankee style in the legacy of the French physiocrats such as Quesnay (Kuczynski and Meek, 1972), who emphasised the importance of the economic aspects of agriculture, seeing it as the primary source of national wealth. In direct contrast, the Southern style is the more obvious inheritance of Thomas Jefferson's (1984) interest in the social and political importance of the independent smallholder, seen in terms of anchoring the foundations of a new state in the stability, integrity and morality of its farm-based citizens. In the UK, Austin et al. (1996) identified two motivational factors, which they labeled as 'entrepreneur' and 'Yeoman', which in broad outline bear considerable similarity to the Yankee and Southern types in Smith's analysis. Perkin and Rehman (1994) similarly identified a 'monetary' and a 'lifestyle' factor in their study of the motivations of Berkshire farmers, but they added a third perspective—an 'independence' factor—seen as critical in the farmers' perceptions of valued aspects of farming.

Using a more qualitative approach, Shucksmith (1993) directly addresses the more complex concept of the 'perceptual frameworks' of farmers, a theme also considered in detail by Lowe et al. (1997). Shucksmith's study identifies three types of farming outlook: accumulators (who are looking to

expand the farm business and see themselves as flexible and business-oriented), conservatives (traditionalists who are largely inflexible in outlook and committed to a farming way-of-life) and disengagers (who are decreasing their involvement with farming). Drawing on Bourdieu's (1977) concept of 'habitus'—the 'habitual' structure of thought that an individual develops as a process of learning and socialization—he suggests these types are characterized by mental frameworks that preclude certain behaviours (for example, diversification) not out of rational deliberation regarding costs and benefits but because they may be incompatible with the individual's habitus. In this sense, they are literally 'unthinkable' because they lie outside the scope of actions that are considered within the agent's habitual frame of reference.

While habit is generally conceived of as a routinised pattern of behaviour, as Shucksmith identifies the notion of habits of thought is more central to its role in determining choices. These habitual frameworks provide personal mental frames of reference that individual farmers use (implicitly or explicitly) to guide their decisions. The criteria by which success is measured in these perceptual terms may vary among different farm groups, reflecting different 'rationalities'. Thus, for example, Glenna (1996) compared the rationales advanced by three farmers all of whom had impounded water on their land and found these reflected not simply different objectives for the water use but different frames of reference for the wider purposes of farming: an economic, a traditionalist and an aesthetic conception.

Such complex variations in perceptual frameworks have been a key focus of work in the 'farming styles' approach, associated in particular with the sociological work of Van der Ploeg and Long (1994), which they situate in the analytical tradition established earlier at Wageningen University by E.W. Hofstee. The concept of farming culture, or more correctly of a multitude of farming cultures that reflect different complex but discrete arrangements of social, economic, technical and environmental factors within a particular locality, and thereby define a particular local or regional culture or style of farming, lies at the heart of the farming styles approach. Van der Ploeg emphasizes the 'multidimensionality' of the farm situation and suggests that the farm itself is a hub through which run many different dimensions of experience—social relationships, economic flows and ecological impacts. The farm therefore represents a point which makes connections between all these dimensions or elements, not simply in the physical aspects of the farm but also in the interpretation of the farm situation by the farmer, which can only be understood as a whole. This complexity again militates against simple classificatory approaches to farm typology based on only some dimensions, such as scale or technological orientation. Thus, environmental management may

not sensibly be separated from agricultural activity in particular farming styles, but integrated with it in quite complex and relatively unique ways.

The application of Q methodology (outlined in more detail below) is particularly well suited to the study of perceptual frames of references, although its use in reported agricultural research remains very limited. Two previous studies of note are Fairweather and Keating (1994), who studied the goals and management styles of 50 New Zealand farmers, and Walter (1997), who examined 'images of success' among 68 Illinois farmers. The Fairweather study identified three types: 'dedicated producers', 'flexible strategists' and 'environmentalists'. In an interesting analysis, they suggest that these three types correspond to prevailing views of the priorities of agriculture at different periods in farming history, with the dedicated producer reflective of the traditional role of farming, superseded by profit-oriented strategists in the mid-1980s, and potentially leading into environmentalism as the concern of the moment, and the future. Walter's approach defined four archetypes—'steward', 'manager', 'conservative' and 'agrarian'—indicating some partial overlaps with Fairweather's study. The 'steward' is characterized by a moral commitment to good husbandry; the 'manager' is akin to the 'flexible strategist' in prioritizing analytical skill in business management; the 'conservative' is concerned with the long-term preservation of the farm; and the 'agrarian' attaches greatest value to the rural way of life and community.

As Fairweather and Keating identify, these detailed portraits of particular orientations are more complex than the simple divisions identified in many previous studies, in particular expanding considerably on the basic difference between 'business' and 'lifestyle' centred farmers. The benefit of Q methodology is its ability to identify relative priorities across a range of influences in the minds of respondents, which give a fuller portrait of their concerns when achievement of all goals is impossible. The intention of the current study was to use Q methodology to establish in more detail the perceptual frameworks of arable-mixed farmers in relation to normative concerns with the appropriateness of different kinds of farming styles and activities. In particular, it was concerned with outlining how farmers construe the rights, responsibilities, freedoms and duties they feel they hold in relation to aspects of environmental management, most notably species conservation and environmental pollution. These normative aspects are particularly relevant in the context of new policies, which are trying to incline farmers into adopting more environmental management activity.

3 - The current study

3.1 - Q methodology approach

Q methodology was pioneered by William Stephenson with application in the field of psychology and has more recently been popularised by Stephen Brown at Kent State University (Stephenson, 1953 and Brown, 1980; see also Adams and Proops, 2001). In Brown's words, it aims to provide the foundation of a 'science of subjectivity'. The method uses factor analysis to extract patterns of similarity between the responses of a small respondent sample. Respondents are presented with a set of items for evaluation, the items usually being opinion statements (but other media such as pictures can also be used). These items are evaluated by each respondent by cross-comparing and then placing them into a ranking grid in a process known as a Q-sort, which involves assigning each item to one of several ranks which indicate different degrees of agreement and disagreement. By enabling comparison between items, this provides a complete ordering of items across the ranking range (a completed Q-sort). A matrix of cross correlations between all Q-sorts is then subjected to factor analysis, which extracts factors that capture the main dimensions of similarity between the respondents' Q-sorts. Each dimension or factor extracted thereby identifies a particular viewpoint, with the loading of a respondent on a particular factor giving the extent to which a respondent agrees or disagrees with it.

Each factor extracted can itself be represented by a single Q-sort, by constructing a weighted aggregate Q-sort based on those Q-sorts which load significantly on that factor. This yields an archetypal or 'criterion' Q-sort, which can be taken as representing a common viewpoint broadly shared by a number of respondents. The set of criterion sorts identified within a Q study is the principal target of the statistical analysis. Q methodology therefore searches for distinctive patterns of thinking about particular issues and individuals who all score highly on a certain factor can be taken as presenting a particular viewpoint, represented by its criterion Q-sort.

3.2 - Conduct of the study

The current study entailed a survey of 102 predominantly arable farmers across the Eastern region of the United Kingdom, principally East Anglia—a very much larger sample than is unusually found in Q studies, due to implementation in concert with a linked survey. In keeping with a Q study, this sample was not random but chosen to include a range of perspectives, including a significant proportion of 'environmentally minded' farmers. The numbers in different attitudinal groups varied considerably in the final sample due to practicalities in recruitment, but this variability in group

numbers does not significantly influence the case-wise factor analysis: the broad characterisation of the sample into distinctive profiles is still driven by the similarities uncovered between sub-groups of respondents. It is however important to note that no inferences can be made about the wider population distribution of the groups identified in the study since it is non-random; this remains an issue for further study. The farmers were recruited from a variety of sources including local branches of the National Farmers Union, regional and national organisations concerned with farming and the environment, and tenants of large landowners such as the Oxford and Cambridge colleges. The farms in the current study were broadly reflective of full time farm businesses, with diverse interests; the one factor of note is that the sample did not contain any obvious ‘hobby farmers’ (those with other main jobs and with holdings of well below a full-time job equivalent size).

A set of 33 statements used in the Q study was developed from a combination of sources, including previous survey questions, and intended to cover farmers' views across four specific areas: technological orientation, farming freedom and responsibility, environmental crime and punishment, and the current state of agriculture. Many of the statements were written specifically for the study, which differs from conventional Q procedure in which interviews are used to derive an initial set of statements. The resulting Q statement set is therefore targeted to a specific set of issues related to conservation and environmental management, set within a broader context of farming; in this respect it is important to note that the scope of responses and groups identified are therefore limited to this particular set of issues.

The statements were pre-tested in interviews with six volunteer farmers and several research staff and some minor changes made to wording to improve clarity; given the time constraints expected in interviews, the statements were made as concise as possible. Each statement was rank scored by farmers in the course of an interview on a nine-point scale from + 4 (strongly agree) to – 4 (strongly disagree), using a typical Q-sorting grid shown in Fig. 1 (see Brown, 1980 or Adams and Proops, 2001, for an explanation of the procedure). The full set of statements can be seen in Table 1.

-4	-3	-2	-1	0	+1	+2	+3	+4
-4	-3	-2	-1	0	+1	+2	+3	+4
	-3	-2	-1	0	+1	+2	+3	
		-2	-1	0	+1	+2		
			-1	0	+1			

Fig.1 Q-sort ranking grid used for assigning statement scores.

Statements	Groups scores*				
	E	P	CC	J	Y
1. Any pollution caused by agricultural chemicals is insignificant compared to their benefits in increasing production.	-3	0	-3	-2	0
2. There should be more access routes onto farmland to help people to visit the countryside.	0	-4	0	-1	-3
3. Farmers have a duty to conserve soil and water resources for the next generation, whatever the impact on profits.	3	2	1	-1	3
4. Chemical use is a vital element in running a successful farm and will probably always be so.	0	4	1	2	3
5. Natural things should be respected as valuable in themselves and not just for what humans can get out of them.	3	1	2	1	1
6. Beyond earning a reasonable income, the main joy in farming is the lifestyle.	1	0	-3	2	4
7. It is important to help smaller farmers stay on the land.	2	-3	-1	4	0
8. Wildlife conservation should only be considered once you have reached financial objectives.	-2	-1	1	-4	-3
9. Planning and financial management are the most important aspects of running a farm.	1	3	4	4	2
10. Good quality farmland that is not being used to grow crops is essentially being wasted.	-1	-2	-1	1	2
11. Enough is being done to protect and enhance the rural environment currently.	-2	1	-2	0	-1
12. Rare species can be a chore to look after and you're better off without them on your farm.	-3	-1	-2	-2	-2
13. Farmers have the right to manage their own land how they wish.	-1	1	2	3	1
14. Many of the species conservationists want to protect are not worth worrying about.	-4	-2	-1	0	-3
15. Environmental damage from agriculture is generally caused by low income farmers or farmers on poor land.	-3	-1	-4	-4	-2
16. Farmers have a greater responsibility to produce plentiful food than to preserve everything in the rural environment.	-1	0	-1	0	-1
17. Agricultural damage to recognised rare habitats is a source of shame for those who cause it.	3	2	2	-1	1
18. Farm traditions and culture are outdated and have little place in a modern agricultural world.	-2	-1	-3	-3	-2
19. A successful agricultural sector is important for the vitality of rural communities.	4	4	3	3	4
20. Farmers who cause environmental damage should be more heavily punished.	2	-3	0	1	-1
21. Britain's agricultural land is in a better state now than it has ever been.	-1	3	-2	2	2

Statements	Groups scores*				
	E	P	CC	J	Y
22. Farmers should feel guilty if they cause a water pollution incident, whatever the cause.	2	3	- 2	- 1	0
23. Whenever possible, farm labour should be replaced by more efficient machines and technologies.	- 2	0	- 1	- 2	- 1
24. Maintaining an attractive-looking countryside should be an important goal of farmers.	1	1	3	0	3
25. It is important to be respected as a good farmer by other farmers.	0	- 2	0	- 1	- 1
26. Rented land is generally less well cared for than land which owners work themselves.	0	- 3	2	- 3	0
27. Farmers should always protect unique or rare habitats on their farms regardless of what compensation is available.	2	- 1	1	- 2	1
28. The more money you make from farming, the more you should be willing to spend on enhancing wildlife and other environmental concerns.	1	0	3	0	1
29. Wildlife enhancement schemes are essentially for hobby farmers or those in poor locations.	- 4	- 2	- 4	2	- 4
30. Modern agriculture is a source of some major ecological problems and needs significant modification.	1	- 4	1	- 3	- 2
31. All the earth's resources, such as minerals, fuels, forests, should be used as sparingly as possible.	4	1	0	1	2
32. Achieving high crop yields is the sign of a good farmer.	- 1	2	0	1	0
33. Financial viability has to be the judge of everything you do on a farm.	0	2	4	3	- 4

Table 1 Statement scores for each of the five groups (*E: Environmentalists, P: Progressives, CC: Commodity Conservationists, J: Jeffersonians, Y: Yeomen)

4 - Analysis of results

4.1 - Extraction and specification of factors

The criteria for factor extraction in Q studies differs significantly from standard factor analytic approaches (Brown, 1980, pp. 222–224). The eigen values for each factor extracted in Q represent the sum of squared loadings of cases on a factor, and the size of the eigen values is therefore dependent both on the number of cases of particular types within the sample and the total number of cases. Both these features are problematic, since in the first case Q respondents are seldom chosen as random samples and, in the second, in larger samples, the sum of numerous very small

loadings can thereby contribute to a large numbers of factors with eigenvalues over one, none of which is very significantly correlated with an individual Q-sort. In contrast, a scree slope test often identifies only a single factor, whereas following rotation, more useful factors can be derived if they have been initially extracted.

Various alternatives are employed in Q studies. One is to retain initially factors with at least two significant loadings; an alternative known as Humphrey's rule is to retain a factor if the cross-product of its two highest loadings exceeds twice the standard error (Fruchter, 1954). Given the large number in the sample, the criterion used here was a conservative one to retain factors that initially identified three or more significant loadings; a significant factor loading in Q being determined by reference to the standard error of the zero-order correlation between case and factor.

The preferred solution was obtained with a principal component analysis and a Varimax rotation with five factors retained (conducted using the readily available freeware program, PQ Method). The five factors extracted therefore provide five distinct interpretations of the relationship between agriculture, the environment and farming values, made evident through the Q analysis procedure. These explained 54% of the underlying variation in responses, with 96 Q-sorts loading significantly on them. In keeping with the standard approach in Q methodology, in reporting the results, we focus on the interpretation of the criterion Q-sorts representing the factors and, to this end, we identify each criterion sort with a name appropriate to its dominant characteristics (but we do not mean to imply that the subsequent descriptions are definitive of these terms beyond the bounds of this study). The five criterion sorts thereby represent the views of groups of similarly minded farmers. In the order introduced below, the five groups are termed (with the number in brackets showing the number of farmers who are uniquely associated with each of these factors—i.e. for whom it was their only significant factor loading; 23 farmers were mixtures of these 5 types, loadings on more than one, and 6 remained 'unclassifiable' without any significant loading): Environmentalists (35), Progressives (12), Commodity Conservationists (6), Jeffersonians (5) and Yeomen (10). The criterion Q-sort scores representing each group are reported in Table 1 and, in the following analysis, we refer to specific statements in brackets (for example, S2 refers to the statement score for statement 2).

4.2 - The Environmentalists

The Environmentalists group is highly distinctive for the strength of its 'green' ideology. It shows in particular support for both generalised notions related to sustainable resource use (S31) and an attitude of 'respect for nature' that is opposed to an exclusively utilitarian approach to the use of living things (S5). While sparing use of resources might be considered a pragmatic and prudential approach from an anthropocentric perspective, this group appears to give a similarly strong weight to a more ecocentric perspective. The statements that refer more explicitly to normative notions of blame and responsibility for impacts on different dimensions of the agricultural environment, such as rare species, habitats, and soil and water, also form a high priority for this group (S17, S3).

This emphasis on ecocentric principles is also in evidence at the negative end of the scale, where the Environmentalists strongly reject the notion that wildlife-based agri-environmental schemes are somehow not part of 'proper' farming (S29). They are clearly in favour of increased agri-environmental support, and in keeping with their attitude of respect for natural things is their strong rejection of the idea that some rare species are not morally considerable (S14). Moreover, alongside these strong opinions in favour of conservation, there is a very clear concern with the environmental impact of agricultural chemicals (S1), and a distinctive interest in increasing punishments for farmers who cause damage to the environment (S20). The Environmentalists certainly seem willing to entertain the idea that stick as well as carrot is a necessary tool of policy.

In conclusion, while other groups show elements of concern for aspects of these issues, the Environmentalists are the one group which consistently make them a priority. They therefore form a kind of reference group against which the level and orientation of environmental responsibilities among the other groups can be judged. The pre-eminence of ecological concerns for this group means that other aspects of the farm situation, such as financial planning, are of little salience in the context (S9, S33). In keeping with every group, the privileged position of agriculture in the rural community is a key concern (S19), but other aspects such as lifestyle are not considered with the same heightened priority.

4.3 - The Progressives

In distinction to the Environmentalists, the attitudes of the Progressives are most clearly evident in robust support for modern farming methods (S4). Not only are they dismissive of potential pollution issues (S30), but they also believe that the quality of the agricultural resource base is currently being maintained in a state of excellence, presumably by applying these chemical methods (S21). This

emphasis on modern technology should not be interpreted however as an 'anti-environmentalist' stance. It is the technological beliefs of the Progressives that make them highly distinctive, not a rejection of the idea that other living things should be given consideration in the process of farming. In fact, overall, their recognition of duties of care for resources and wildlife is actually reflective of the views of environmentalists, although at a lower level of concern (S3, S17).

On one point, however, there is a notable exception—the issue of stronger punishment for environmental offenders (S20). The apparent lack of concern for damage implied here should be considered within the Progressives' frame of reference, which is that modern methods are essentially benign. The Progressives are keen to reject the premise that agriculture is causing environmental damage. Their response to the notion of feeling guilt for a water pollution incident, however, where the 'damage' is defined in clear and unmistakable way, makes their sense of environmental management responsibility more obvious (S22). Here, they actually exceed the Environmentalists in their sense of responsibility for effective environmental management, a position reminiscent of Lowe et al.'s (1997) characterization of more radical farmers as 'environmental managers' who are highly pro-active in attempting to avoid pollution. The Progressives are also supportive of the general notion of resource care (S3).

If the Progressives feel they are the standard bearers of positive new methods, they then recognise that those methods must be well managed. They are not blasé about the responsibilities that come with agriculture, but view them as being maintained through the adoption of modern methods. One implication of modernisation is structural adjustment and, on this issue, the progressives demonstrate a very distinctive vision from the other groups, indicating scant support for small farmers as a policy for its own sake (S7). Despite this emphasis, they do not reject outright the notion of farm traditions and culture, shared with other groups, and which might be thought at odds from a progressive or 'modernisers' approach (S18). The Progressives do not seem to associate 'farm traditions and culture' with out-dated technologies, but rather with more fundamental attitudes of resource husbandry and care, which they believe they continue to uphold—but using state of the art farming methods.

4.4 - The Commodity Conservationists

The distinctive character of the Commodity Conservationists is established by their very strong financial focus. Rated most highly by this group are the two statements concerning business and

finance (S33, S9). In addition to this emphasis on money management is a highly individual perception of the link between conservation and wealth. While all the other groups seem to see no direct connection between income and environmental issues, for the Commodity Conservationists this appears to be a crux issue. They see conservation as dependent on income (S28) and, unlike the majority of other groups, they do not strongly reject the idea that wildlife should be subordinate to financial targets (S8).

This combination is particularly distinctive. There is a strong recognition that although the conservation issue is important, it also costs money and its protection must come from those that can afford it. By implication, there is then a need for more money for conservation generally, which explains the group's very strong rejection of the idea that agri-environmental schemes do not fulfil a useful role for all types of farms (S29). For the Commodity Conservationist such schemes, which transfer money to farmers in payment for environmental work, are exactly what is needed. Alongside this view of the need to make conservation pay for all farmers is a strong rejection of the idea that low income farmers are responsible for environmental damage (S15). From this perspective, all producers are implicated in environmental problems, and this links to a series of statements which show that the Commodity Conservationists are certainly troubled by the current direction of agriculture and looking (and by implication, asking government) to provide rewarding or at least financially viable ways of re-directing it (S1, S11, S18, S21, S24).

The farm 'traditions and culture' which Commodity Conservationists feel should not be forgotten (S18) are presumably just those elements which encourage farmers to maintain pleasant landscapes and wildlife diversity as an integral part of the farming process. A final highly distinctive aspect of this group is its rejection of the notion of 'lifestyle' (S6). Here, it can be noted that the concept of lifestyle in farming is a complex one. Under one reading, the term 'lifestyle farmer' has (from a hard-working food producer's point of view) pejorative implications of being a 'hobby' farmer, who does not earn a genuine living by farming but relies on other income sources and just enjoys living in a rural location. This notion is likely to be strongly rejected by most full-time farmers. On the other hand, 'farming lifestyle' in the sense of 'way of life' is a well-documented positive element linked to the practice of farming found in many attitudinal studies. It can be noted however that a strong emphasis on business and finance has been found to go with less interest in 'way of life' orientation (Walter, 1997). That is, business-oriented farmers tend to be business first and lifestyle second in comparison to other groups, which fits the more managerial profile of this group.

4.5 - The Jeffersonians

Like the Commodity Conservationists, the Jeffersonians show a very strong emphasis on the importance of financial viability in addition to business management (S9, S33). While along with the Commodity Conservationists they also reject strongly the notion that small farmers are to blame for environmental damage (S15), in the Jeffersonian's case, this is combined with a highly distinctive concern to help keep small farmers on the land (S7). This group is concerned with the social dimension of agriculture delivered by sustaining larger numbers of smaller farmers and the issue of farm financial viability on which this vision of agricultural depends is clearly a key concern.

In fact, this group, unlike the Commodity Conservationists, are moderately positive about the technological orientation of modern agriculture. They are ambivalent about pollution problems and like the Progressives they strongly reject the idea that modern agriculture needs significant modification (S22, S30). Instead, it seems that, rather than expressing environmental concern, for this group it is much more important to reject what they perceive to be unfair demands made on farmers to enhance the environment (S3). Freedom from interference is stressed by the Jeffersonians (S13), together with a rejection of (or at least ambivalence to) the idea that there is an environmental responsibility that transcends cost (S27). This cost sensitivity in combination with moral ambivalence about environmental protection marks them out very distinctively from the other groups.

In conclusion, a final combination of responses is particular interesting for this group. The Jeffersonians are unique in denying that agri-environmental schemes really have a role to play in 'proper' farming (S29). This is certainly consistent with their more general ambivalence to environmental issues. However, they also reject very strongly the notion that conservation should come after financial targets (S8). These farmers may reject the implications of the question in two senses; they are working hard to meet financial targets but wildlife is not some future goal which they are concerned about after assuring viability; and since they are largely positive about modern farming methods, the implication that wildlife conservation is compromised by modern agricultural practice is also rejected.

4.6 - The Yeomen

The final group, the Yeomen, are most readily defined by two characteristics: their focus on farming lifestyle as a positive aspect of farming (S6), and a strong rejection of judging everything in financial terms (S33). They also show less interest in the importance of planning and financial management than most other groups (S9). Lifestyle, under whichever of the interpretations suggested above, is clearly dominant in their interests. The technological orientation of these farmers shows support for modern methods (S4, S30), but concomitantly they support an attitude of careful use of resources and also show an interest directly in environmental responsibilities (S3, S31). There is also an emphasis within this group on some aspects of the multifunctional role of farming, expressed in their concern to maintain an aesthetically appealing countryside (S24); however, they reject the notion that there should be more public access onto farmland, indicating that more active involvement of non-farming interests in the rural landscape is certainly not welcome, a view they share with the progressives (S2).

Farming for this group therefore seems to have more explicit non-economic functions, once again creating a distinctive group profile. These farmers emphasise that economic criteria are not relevant to selecting their preferred approach to land management. This allows them to look on nurturing the landscape as a cherished goal of farming. Since they reject the idea that economic criteria should be the basis of farm decision-making, it is no surprise to find that they reject the idea of conservation being dependent on income (S8). They accept that wildlife conservation is integral to good farming (S14) and they recognise a strong role for agri-environmental schemes (S29). This is however set alongside a generally positive view of modern agriculture (S4). They are supportive of the promotion of conservation and believe in a general duty of care to living things, but their focus is better described as one of good husbandry and not of 'green' ideology.

A final feature of particular interest for this group is its view of the purpose of land. It shows a moderately positive attitude to the agrarian ideal that good land should be used to grow crops, a view that distinguishes them from all but the Jeffersonians (S10). The Yeomen seem to see agriculture in a central role in the rural environment, linked in with other elements of the rural fabric but still providing their dominant sense of purpose. In conclusion, the Yeoman values the farming way of life, with emphasis on independence from financial constraints, and sees the role of farming as a benevolent shaping of an attractive rural environment with environmental benefits delivered as an integral but not central part of the process.

5- Discussion

The models sketched above indicate considerable diversity in what land managers feel are legitimate expressions of environmental stewardship. Perhaps most evident is the fact that no groups emerge with a purely 'productivist' outlook that disparages some kind of environmentalist value system. There were a very few respondents who had a negative loading on the environmentalist factor, but the broad groupings are not differentiated along these lines. Rather, it seems that it is the interpretation of the 'conservation ethic'—how it is translated into practice, but not its fundamental legitimacy—that accounts for most diversity among the groups. A similar finding is apparent in the study of conservation behaviour by Beedell and Rehman (1999), who found that differing views on the environmental benefits of different hedgerow management practices were more important in determining behaviour than fundamental attitudes, which were broadly positive to environmental concerns. The attitudes shown here reveal a similar variety in the interpretative frames of actors, alongside a commonality among some of these value commitments.

On a related point, the groups' characteristics also indicate that stewardship issues may perhaps be best characterised as falling into either 'pure' or 'mitigated' categories. Thus, the Environmentalists are the holders of the clearest 'pure' duty orientation, under which conservation is not only an end in itself but an end that transcends or 'trumps' alternative ends. In contrast, the Commodity Conservationist ethic is amenable to conservation but this is mitigated by financial considerations. From this perspective, it is reasonable to be asked to undertake conservation work, but also reasonable not to undertake it if so doing inflicts losses on the business. The Progressives lie somewhere in between this position and the environmentalists, while the Jeffersonians are less motivated to consider environmental activity even when schemes provide opportunities to do so.

As noted above, these alternative 'conservation ethics' also provide the background against which the legitimacy of government policy is judged. It seems likely that regulation is a more acceptable policy approach for those behaviours that coincide with relatively 'pure' duties, whereas agri-environmental schemes that offer incentives will be seen as appropriate for duties that are more readily mitigated by circumstances. Perhaps due in part to the influence of current policy, it seems that protecting soil and water are more readily seen as pure duties across all farmer types whereas generalised concern for wildlife and landscape are more easily mitigated in individual circumstances. Since the productive capacity of the land is vital to any kind of farming, it is perhaps not surprising that a particular relevance attaches to its protection.

The distinction between 'pure' and 'mitigated' duties above might also be characterised in an economic context by distinguishing 'pure' duties as examples of lexicographic preferences (Spash, 1998). Lexicographic preferences do not allow trade-offs between alternative sources of utility for the individual and hence establish a decision framework for an actor which defines the boundaries within which choice is exercised. These boundaries do not themselves enter into economic decision-making in the evaluation of costs and benefits. A baseline level of protection should therefore be provided for elements of the environment which are associated with pure duties, while mitigated duties will be dependent on economic circumstances; but this reference level may also change over time. Beyond the question of which kinds of responsibilities attach to which aspects of the environment for different groups of farmers therefore lies the further question of how these responsibilities evolve, particularly in respect of the changing impressions created by different agri-environmental policies regarding what levels of pure or mitigated commitment are appropriate.

In summary, some key distinctions between groups are identified in Table 2, where we suggest the different policy orientations that correspond with the stewardship positions identified. Different policy instruments will clearly have different impacts given the variation in motivations and interests across these groups. Thus, for example, we might anticipate that a policy leading to a rise in agricultural incomes in general would lead Progressives and Jeffersonians to make investments in production-related technology, whereas Environmentalists, Commodity Conservationists and Yeomen might spend more, *ceteris paribus*, on conservation and amenity benefits. Similarly, free conservation advice provided by extension agencies would be more likely to appeal particularly to the Commodity Conservationists, whereas Environmentalists and Yeomen might be expected to buy in these services even if they were not freely available. The Progressives on the other hand would prefer to see free advice targeted on technical efficiency, which might improve both profitability and aspects of environmental management at the same time.

In terms of species and habitat conservation, the Environmentalists indicate an interest in a fundamental shift in agricultural practice that might increase the compatibility of conservation and arable farming, such as organic and low input approaches. The more technologically optimistic groups, however, seem more likely to favour a 'dualistic' approach with minimal shifts in technology on productive land and wildlife concerns served by set-aside or reserved areas, preferably of course with compensation attached. The managerial focus of the Commodity Conservationists seems well suited to re-evaluating whole farming systems but they need strong financial incentives to do so. Thus, they seem likely candidates to become 'pragmatic' organic producers if the combination of

prices and grants is right, staying with the production system as long as it is profitable, whereas the Environmentalists would be more likely to be 'committed' organic farmers, adopting the approach more resolutely on the basis of a deeper normative commitment (Fairweather, 1999).

Groups	Stewardship position	Policy orientation
Environmentalists	Ecocentric/environment focus	Favour increasing environmental controls, both regulatory- and market-based; alternative technology development, emphasis on conservation priorities
Progressives	Environmental managerial/technology focus	Favour conventional technical innovation, environmental management emphasis; competitiveness and continuing structural change
Commodity Conservationists	Environmental goods marketers/business focus	Favour increasing market-based incentives for environmental goods, but minimal regulatory control; support compensated reductions in intensification and diversification
Jeffersonians	Traditionalist/community focus	Favour status quo and production-related support; more isolationist and independent; prioritise social over environmental policy
Yeomen	Multifunctionalist/lifestyle focus	Favour increased conservation incentives; support integrated rural development policy, emphasise personal environmental responsibility

Table 2 Summary of stewardship and policy orientations amongst the five perspectives

6 - Conclusions

The perspectives identified here show some characteristics familiar from a number of previous studies. There are groups with a strong lifestyle orientation and those with a financial focus. The benefit of a case-based factor analytic approach, however, is that groups of similar individuals, rather than isolated attitudes or traits, are identified. In this sense, Q methodology assists in a

structured analysis of what sets of attitudes, values and beliefs combine to form coherent perspectives or discourses on the topic of agri-environmental stewardship, held by practicing farmers. This has significant advantages in the current context by enabling the identification of groups of individuals who define their management priorities and underlying beliefs in similar ways. These appear more complex in relation to environmental management than the basic duality of business and lifestyle interests considered in many previous studies.

The analysis conducted here however is very much a first step in mapping out the significant perceptual variations among farmers on stewardship. In particular, two further questions are critical. Firstly, while Q can demonstrate the presence of these alternative perspectives, the non-random nature of the study does not allow us to determine the relative distributions of these different perspectives across the arable farming community. This question is clearly of significant interest from a policy perspective. A farm population dominated by Progressives and Jeffersonians, for example, will be much less amenable to a reorientation towards multifunctionalism and agri-environmental schemes than one composed principally of Environmentalists and Yeomen. In this context, regulatory approaches that simply emphasise punishment of regulatory transgressions and impose new objectives without addressing these perceptual problems may act principally to alienate these groups, thus generating large monitoring and enforcement costs, while failing to develop an ethos supporting the legitimacy of such controls (Ward et al., 1998).

On the other hand, regulation is itself also an important signaling device which communicates a set of values endorsed by government (Elster, 1989). This prompts the second question, equally important from a policy perspective, of how alternative environmental perspectives are themselves generated. Determining causality in this instance is of course a complex task and is likely in any case to reveal many factors over which government policy has little if any control. However, we do not know currently how dynamic these perspectives are and, in particular, the potential for movement either between perspectives or indeed for new perspectives to be formed over time. It is evident, for example, that the more traditionalist Jeffersonian perspective has endured despite the increasing emphasis on both diversification and environmental management from policy makers. Certainly, there was anecdotal evidence presented in interviews indicating that some farmers had shifted their positions over time, generally towards a more environmentally conscious approach. There were also others whose experiences with agri-environmental scheme prescriptions had been so negative that they had withdrawn from them and would not contemplate joining again. Interestingly, these were

environmentally motivated farmers who felt the management prescriptions were actually detrimental to their own conservation objectives.

In general, paradigmatic values are fundamental to issues of personal identity and are thus thought to change relatively slowly, if at all, compared to less fundamental beliefs related to more practical or technical matters (Rokeach, 1973); a rate of change of decades, often also reflecting stages in a family life cycle, might therefore be anticipated for individual evolution in perspectives. A secondary question is therefore how the composition of the farming industry as a whole is changing over time, particularly as new entrants may bring alternative perspectives. There is, for example, limited evidence to suggest that different styles of environmentalism may characterize both young farmers (typically more radical) and older farmers (typically more extensive in their outlook), when compared to middle aged farmers supporting young families (who tend to be more production and profit oriented) (Potter and Lobley, 1996). The willingness to channel income in favour of environmental priorities may therefore be shifting at different rates for individual farmers and for the farming profession as a whole.

In conclusion, the approach of Q methodology itself has provided a useful investigational approach with a level of sophistication beyond standard structured survey methods; furthermore, the assessment process itself was very positively received by interviewees, leading to a good level of engagement in the Q-sorting task. These perspectives on stewardship capture a snapshot in time, with some obvious references to key influences identified in past studies but a range of more detailed insights. These relate only to arable farmers in a single region and, although we might expect little geographical variation in attitudes across UK arable farmers as a whole, the East Anglian region is certainly distinctive for its level of intensity, its relative profitability and, in some areas, for its limited conservation interest. Further work is seeking to develop the approach adopted here to explore the wider distribution of these perspectives across the UK, and to link these attitudinal components with an analysis of both structural and policy response factors.

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