An analysis of the subjective opinion of farmer stakeholders to implementation of the EU Nitrates Directive in the Republic of Ireland.

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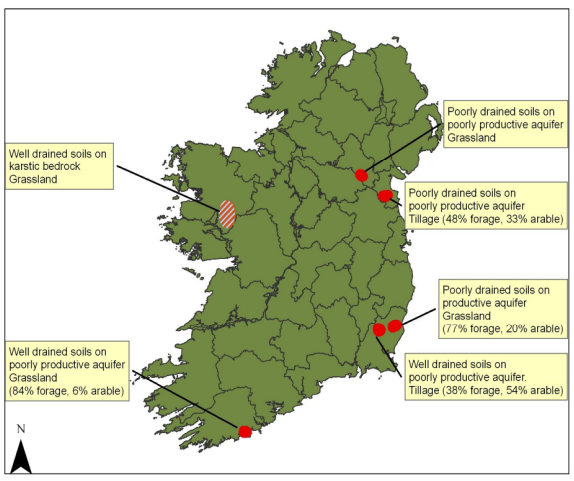
INTRODUCTION

The 1991 Nitrates Directive is one of the earliest pieces of EU legislation aimed at controlling and improving water quality. The Directive aims to minimise surplus phosphorus (P) and nitrogen (N) losses from agriculture to the aquatic environment. Nutrients in fertilisers (principally nitrogen, phosphorus and potassium) promote plant growth but application in excess of plant requirement can cause negative environmental externalities such as eutrophication. The Nitrates Directive requires each member state to introduce a programme of measures through a National Action Plan (NAP). However, these NAPs have not met with universal acceptance by farmers across the EU. None more so than is the Republic of Ireland where there was considerable political opposition. The Irish NAP was not transposed into legislation until 2006 through the Good Agricultural Practice (GAP) regulations (S.I. No. 378 of 2006).

Farmers in the Republic of Ireland have voiced opposition to operational elements of the GAP regulations (Brosnan, 2004). Farmer acceptance of the legitimacy of the measures is a key element of compliance. The efficacy of the NAP measures is being evaluated holistically in the Republic of Ireland by an Agricultural Catchments Programme through intensive bio-physical and socio-economic monitoring in six representative small scale river catchments dominated by moderate to high intensity grassland and arable enterprises across Ireland (see Fealy et al., 2010) as outlined in Figure 1.

Figure 1: Catchments Selection



This research aims to investigate the attitude of farmer stakeholders towards implementation of the GAP regulations using Q methodology. Q methodology is a technique first pioneered by William Stephenson (1935) and encompasses a distinctive set of psychometric and operational principles that when combined with the statistical application of factor analysis provides the researcher with a systematic and robust means of examining human subjectivity (McKeown and Thomas, 1988). Q methodology is expressly aimed at identifying different patterns or shared ways of thinking on a topic that is relatively independent of the researcher. The experimental design of the Q methodology reduces any potential researcher bias and pre-specification of concepts by the researcher. Brown (1980) describes it as the 'science of subjectivity' where the goal is to extract patterns of similarity between the responses of a small respondent sample which represent the spectrum of views among the targeted population. The technique is not designed to have results scaled up to draw conclusions about the relevant whole population. However, where there is considerable diversity among respondents it is feasible to make assumptions about the wider target population.

DATA & METHODS

Implementing a Q methodological study typically involves 6 main stages (Addams and Proops, 2000). The first step is to identify the discourse of interest and relevant population. In this instance farmer opinion on the implementation of the EU Nitrates Directive through the GAP regulations.

Second stage implementation involves collection of a full concourse of statements on the discourse by the relevant population. A questionnaire was developed with a number of open ended questions designed to educe statements on the implementation of the EU Nitrates Directive in the Republic of Ireland as implemented through the GAP regulations. The questionnaire was delivered to 6 farmer discussion groups during the summer of 2009. A total of 51 farmers across a range of farming systems completed this scoping questionnaire and 556 statements emerged. However, there was a large degree of repetition among statements generated such that the final concourse of statements totaled 120 statements. The statements were either positive, negative or neutral across a number of thematic areas including farm management, environment, farm profitability, information provision and equity of implementation. Each of the statements was assigned to a relevant box in a matrix depending on the thematic area and orientation.

The third stage of Q methodology implementation involves reducing the concourse of statements down to a representative manageable number, or a Q set. A Q set typically range between 30 and 50 statements. Brown (1993) suggests that in line with sampling procedures the main goal in selecting a Q set is to provide a miniature that is representative of the larger population. The concourse is usually around three times the size of the Q set. In this application of the Q methodology a total of 30 statements were chosen to be representative of the full concourse and structured along a factorial design outlined in Table 1 as recommended by McKeown and Thomas (1988). The frequency with which thematic elements appeared in the final Q set was determined by the original concourse structure.

Table 1: Factorial design of Q-sort

	Positive	Negative	Neutral
Farm Management	4	4	2
Environment	3	3	1
Farm Profitability	3	3	1
Information	2	2	0
Equity	1	1	0

The fourth stage of implementation involves selecting participants and instructing them to rank or 'sort' the selected statements from most agree to most disagree normally following a forced quasi-normal distribution structure. The Q sort were administered to a representative sample of farmers across the agricultural catchments programme (N=59). Respondents were instructed to sort the statements on a 7 point scale from 3 (most disagree) to +3 (most agree).

The fifth stage of statistical analysis involves the extraction of a few 'typical' sorts which are representative of distinct attitude or understanding of an issue or policy. This involves Q sort correlation, factor analysis and rotation to reduce the data to a limited number of defining factors which define different views on the discourse. The penultimate stage was undertaken using PQMethod (Schmolck, 2002). In Q methodology the individual farmers are the defacto variables, hence there could be N different discourses if each farmer ranked the 30 statements in a statistically different manner. Factor analysis determines if there are a smaller number of families of Q sorts that represent a discourse pattern among the participants. A principal components analysis was conducted to identify a small number of heavily loaded factors (groupings of farmers). Varimax rotation was then used to rotate factors to find the simplest structure in the data that can explain the greatest amount of variability.

RESULTS & DISCUSSION

After considering several different iterations it was concluded that a farmer typology based on a 3 factor solution represented the most logical and robust representation of opinion on the implementation of the EU Nitrates Directive across the chosen sample. The 3 farmer groups were labelled "Productionists", "Concerned Practioners" and "Benefit Libertarians". The farm typology derivations are set out in Table 2.

Productionists were most occupied by restrictions on their freedom to farm and seem to take issue with how the regulation dictates farm management practices they deem to be counter productive and which negates their land stewardship experience. Concerned Practioners shared some of the same farm management concerns but were generally more accepting of the environmental benefits of the regulations.

Finally, Benefit Libertarians are generally very accepting of the environmental benefits of the regulations but have some concerns around regulation inspections and being restricted to farm in accordance with their own experience and knowledge.

AGRICULTURAL CATCHMENTS PROGRAMME

Table 2: Statements deriving farm typologies

Statement	G1 - P	G2 - CP	G3 - BL
14. Due to the GAP regulations work such as manure/fertiliser spreading and ploughing are concentrated into the time immediately after closed periods thus increasing the risk of pollution.	3	2	0
25. The GAP regulations have lead to a significant increase in red tape and bureaucracy and have increased pressure and workload.	2	1	1
7. GAP regulations involve significant compliance cost and have placed an additional financial burden on farmers.	1	-1	0
5. The GAP regulations have not helped to improve water quality or the environment.	0	-2	-2
20. The GAP regulations promote good farming practice standards and encourage safety and neatness on farms.	-1	0	1
27. The GAP regulations have restricted the use of chemical fertilisers and have had a detrimental effect on farm yield and output.	1	-3	-1
30. GAP regulations have restricted the potential to expand my farm business.	0	-3	-1
11. The GAP regulations have restricted the freedom to farm in accordance with a farmers own experience and knowledge.	2	0	3
24. The GAP regulations have had no effect on the use of organic and chemical fertilisers on my farm.	-2	0	-2
1. The GAP regulations have made farmers more aware of the nutrient requirements of grassland / crops and encourage the better use of organic and chemical fertilisers.	1	2	1
16. A GAP cross compliance inspection is a serious concern and a significant threat to farm income.	2	-1	3
4. The GAP regulations have helped to reduce nitrogen and phosphorus leaching and run-off and have assisted in improving water quality.	-1	0	2
13. The GAP regulations have made farmers more aware of environmental and pollution related issues associated with agriculture.	0	3	2
15. GAP regulations have increased the emphasis on grassland / crop management and have improved profit margins.	-2	-2	0
2. The GAP regulations have resulted in farming to calendar dates and not to weather/ground conditions and have lead to farmers undertaking farm management practices at inappropriate times.	3	3	0
19. The GAP regulations put undue focus on the potential for agricultural pollution.	1	1	-1

* Distinguishing statements in red

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