Factors underlying farmers' intentions to adopt water protection practices

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1. Key Message:

Subjective norms and access to information are key factors in determining farmers' intentions to adopt water protection measures.

2. Introduction

The modern world faces challenges to produce enough food for an exponentially growing population, while ensuring that consequent intensification of the agri-foods sector does not negatively impact on soil, water, and air quality and biodiversity.

In Ireland, there have been successive strategies for the expansion of sustainable agricultural production - Food Harvest 2020 and Food Wise 2025. While, in general, the level of serious pollution has decreased nationwide and the number of sites with "poor" water quality also reduced, the number of high water quality sites has decreased dramatically since 1987 (Figure 1). Despite numerous agri-environment initiatives to improve water quality, there is still a low adoption level of these practices among Irish farmers. An improved understanding of the factors influencing the willingness of farmers to implement water protection practices helps in the design of more effective measures to combat water quality deterioration.

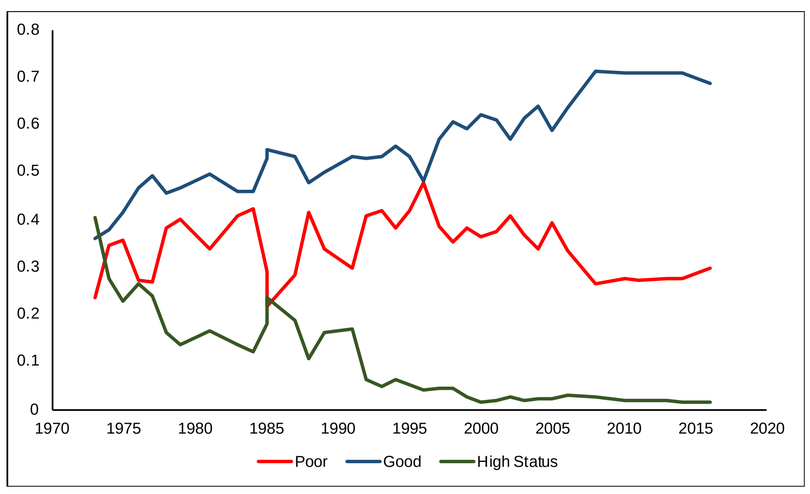

Figure 1:Trends in Water Quality

High Ecological Status (HSW) sites (Q-5) are sites that not have been or little impacted by anthropogenic activities and they are usually used as reference sites to determine water quality.

HSW sites are usually located upstream and within small catchments (Figure 2).

Small streams form up to 77% of all river channels in Ireland

Figure 2: Example of High Ecological Status site (extensive sheep production)

- Nutrient losses (P) from agricultural and forest practices and municipal pollution are linked to the pollution of HSW.
- Recent studies show that water quality is not always correlated to intensity of the agricultural production, and perhaps is site specific.

- Areas within catchments with greater source and transport potential of nutrients, can contribute the majority of P losses to surface waters - even if they cover only a small area within the catchment. These areas High Risk Areas (Figure 3).

Figure 3: Example of High Risk Area i.e. poached ground near the stream

- Avoiding spreading fertilisers in high risk areas can decrease the risk of loss of nutrients and improve the situation in relation to the declining trend of HSW sites. However, this may impose economic, time and nuisance cost to farmers.

Aims:

1) to identify the effect of underlying attitudes of farmers in relation to their intention to avoid/not avoid spreading of fertilisers in high risk areas, and
2) to analyse the influence of socio-economic and psychological factors on the intention to avoid/not avoid spreading fertilisers in high risk areas.

3. Methodology and Data

A survey was conducted on 1,009 Irish farms in late 2016 (Harmony project and NMP WF PhD). Socio-economic and psychological characteristics, farmers' attitudes towards the environment and towards implementation of water protection measures were analysed using the Theory of Planned Behaviour (Ajzen,1991).

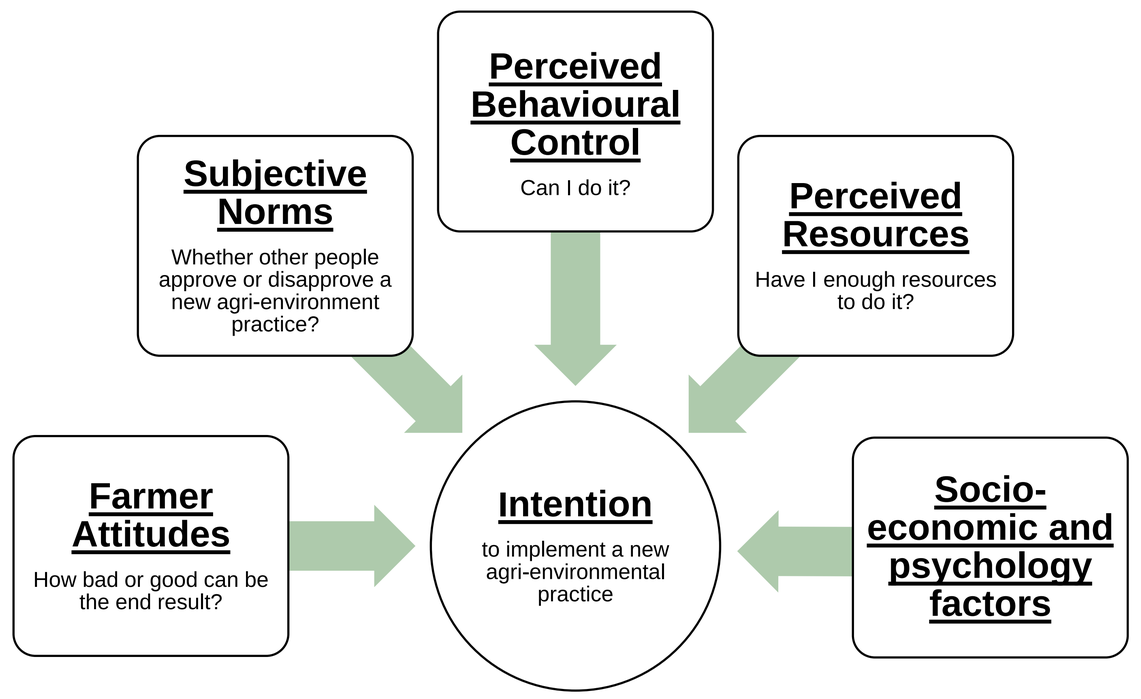

Figure 4: Theory of Planned Behaviour (adapted from Ajzen, 1991)

4. Results

Over one third of farmers stated their intention to avoid spreading fertilisers in high risk areas on the basis of the information provided.

Explanatory Variables	Regression Coefficient
Financial Attitude	-0.606***
Information and knowledge how to do it	0.424***
Concern for environment	0.051
Farmers Attitude	0.173
Subject Norms	0.400***
Perceived Behaviour Control	0.269**
Perceived Resources	-0.081
High Status Water Area	0.537
Farm size 20-30 ha[a]	1.026**
Farm size 31-50 ha[a]	1.235**
Farm size 51-100 ha[a]	0.738
Farm size 101+ha[a]	0.225
Cattle system[b]	-0.708
Dairy system[b]	-0.544
Tillage system[b]	-0.785
Age <35[c]	-0.380
Age 35-44[c]	0.113
Age 45-50[c]	0.358
Age 51-64[c]	0.255
Formal education above second level	-0.176
Policy compliance	0.641
Agricultural advisor	0.029
Pseudo R^2	**0.298**

Table 1: Results of the binary logistic regression for the prediction of farmer intention to avoid spreading in High Risk Areas (National Sample n=377)

Note: Significance level *** p<0.01, ** p<0.05, * p<0.1; [a]Farm size <20 ha was used as a reference category; [b]Sheep farm system was a reference category; [c]Age group 65+ was used as a reference category.

5. Conclusions

1. Financial attitudes are significant negative factors.
2. Farmer's environmental awareness and attitudes towards the measure were not significant , which could indicate lack of information and knowledge.
3. Subjective norms and access to Information about the causes of water degradation and possible solutions must be considered as significant influences which can be used to engage farmers to implement water protection measures.
4. Socio-economic factors were less significant, farm size had no effect on bigger farmers.

6. Acknowledgements

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