

Extended Abstract

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Paper/Poster Title	The good, the bad and the in-between; drivers of sustainability at farm level; a case study of Irish farms
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Abstract prepared for presentation at the 96th Annual Conference of the Agricultural Economics Society, K U Leuven, Belgium

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Abstract	200 words max
<p>The sustainability of Agriculture has been to the forefront of many research agendas. Sustainability, in this respect involves a multi criteria of measures which include economic, environmental and social sustainability. Environmental issues, include reducing GHG emissions, increasing biodiversity and protecting water quality; economic and social issues include providing food for current and future generations and a decent standard of living for farmers and their families. While there are a number of difficulties in measuring these objectives, there also seems to be a conflict, in particular is it possible for farms to be both environmentally and economically sustainable? In this paper we examine the economic and environmental credentials of Irish farms using Teagasc National Farm Survey data. We examine the socio-economic drivers of these best performing farms.</p>	
Keywords	Agricultural sustainability
JEL Code	Q560 see: www.aeaweb.org/jel/guide/jel.php?class=Q)
Introduction	100 – 250 words
<p>The sustainability of Agriculture has been to the forefront of many research agendas. Sustainability, in this respect involves a multi criteria of measures which include economic, environmental and social sustainability. Environmental issues, include reducing GHG emissions, increasing biodiversity and protecting water quality; economic and social issues include providing food for current and future generations and a decent standard of living for farmers and their families. While there are a number of difficulties in measuring these objectives, there also seems to be a conflict, in particular is it possible for farms to be both environmentally and economically sustainable? In this paper we examine the economic and environmental credentials of Irish farms using Teagasc National Farm Survey data. Farms are categorised separately in terms of economic and environmental sustainability indicators. Farms are then categorised by percentile into top middle and bottom performing farms in terms of environmental and economic performances. We then investigate if there are farms which perform in the top percentile of both sustainability indicators. We examine the socio-economic drivers of these best performing farms.</p>	

Research questions:

- Are there farms who are performing well in terms of both economic and environmental indicators?
- Are there farms performing badly in terms of both indicators
- What are the main drivers of farm economic and environmental performance at farm level

Methodology

100 – 250 words

We define Good Farms as farms that have the highest Market Gross Margin Ha^{-1} and the lowest Nitrogen balance Ha^{-1} . The Bad Farms are in the bottom group Market Gross Margin Ha^{-1} and have the highest Nitrogen balance Ha^{-1} . In-between farms are in the middle of both groups. A generalised ordered logit model is then used to investigate the differences between these three farm types. The model includes demographic and socio economic data to uncover the difference in farm sustainability performances

Results

100 –
250
words

The results are restricted to livestock farms as tillage farms tend to perform better in terms of nutrient management and nutrient use efficiencies.

1. Table Market Gross Margin Ha^{-1} and Nitrogen Balance Ha^{-1} of Irish Farms 2010 -2019

	N Balance 1	N Balance 2	N Balance 3	Total
Mkt Gm Ha^{-1} 1	2,072.23	1,350.86	211.42 (BAD)	3,634.50
Mkt Gm Ha^{-1} 2	1,170.49	1,543.19 (INBETWEEN)	501.51	3,215.20
Mkt Gm Ha^{-1} 3	130.50 (GOOD)	371.23	1,250.56	1,752.30
Total	3,373.22	3,265.28	1,963.50	8,602

Table 1 shows the distribution of Market Gross Margin Ha^{-1} and Nitrogen Balance Ha^{-1} NUE of Irish farms between 2010 -2019. We focus the paper on the farms in the Good, Bad and the Inbetween categories.

Table 2 presents the results of a Generalised Ordered logit model where the dependent variable is the

1. Table Results of Gologit model for good bad and inbetween farms 2010 -2019

	Outcome In-between vs Bad	Outcome Good vs In-between
Stocking Rate Lu/Ha	0.0759 (-0.19)	0.519 (-0.9)
Fertilizer purchased €	-0.000252*** (-5.10)	-0.00104*** (-6.38)
Subsidy share of Gross Margin €/ha	-17.69*** (-10.57)	-28.18*** (-7.23)
Age	0.0104 (-0.79)	-0.0434* (-2.14)
Viability	2.754*** (-4.1)	4.983*** (-6.06)
Land Owned Ha	0.0237* (-2.2)	0.0406*** (-3.36)
Off farm Job	0.048 (-0.14)	-0.754 (-1.37)
Agri-Env Scheme	0.593 (-1.28)	0.345 (-0.45)
Total labour units	0.433 (-1.08)	2.931*** (-5.1)
Advisory fee paid €	0.00252** (-2.87)	-0.000183 (-0.25)
Agricultural Education	0.347 (-0.87)	0.223 (-0.39)
Constant	11.38*** -7.91	3.213 -1.74

N 1475

LR chi2(22) = 865.31

Prob > chi2 = 0.0000

Pseudo R2 0.6691

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Discussion and Conclusion

100 – 250 words

Farms that are performing well in terms of both economic and environmental sustainability are a very small group, an indication that achieving high levels of both economic and environmental performances at the same time, is difficult. The farms which do reach these objectives can be described as economically viable farms and are less dependent on direct payments. Farm size as indicated by land owned is larger than the other two groups. These farms are market driven and are more likely to be managed by younger farmers. The worst performing farms are less

viable than the other two groups. They are more likely to be smaller farms managed by older farmers. They also pay significantly less for agricultural advisory services, spend more money on fertilizer and direct payments account for a larger share of overall farm income. These farmers may benefit from additional knowledge transfer services in relation to farm management activities which could potentially lead to both environmental and economic improvements at farm level. There is no significant differences between stocking rates in the three groups which is also an indicator that improvements could be achieved by improving management best practices, rather than changes in the intensity of farm production.