Institution: University of Nottingham

Unit of Assessment: 6; Agriculture, Veterinary and Food Science

Title of case study:
Evidencing the development of the Agriculture Act 2020 and policy to support UK Agriculture outside of the EU

Period when the underpinning research was undertaken: 2004 – 2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Professor Paul Wilson	Professor of Agricultural Economics	1995-present
	Chief Executive of Rural Business Research (RBR)	2009-present [specific role within UoN]
Dr Stephen Ramsden	Associate Professor of Management	1993-2020

Period when the claimed impact occurred: 2017 – 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

Brexit required the UK to have a new Agricultural Policy in place in preparation for departure from the European Union. The University of Nottingham's (UoN's) research (2004-2020) into agricultural business management, agri-environment interactions and sustainable intensification, combined with leadership (2004-present) of the Farm Business Survey (FBS) for England, **delivered 49% of the evidence base that supported development of the new Agriculture Act 2020**. UoN **directly influenced agriculture policymaking** through research outputs and actions that enabled **Defra evidenced-based policymaking** and facilitated understanding of key issues by policymakers, government and industry stakeholders via a range of knowledge exchange activities.

2. Underpinning research
Overview

Since 2004, the University of Nottingham (UoN) has led a consortium encompassing six specialist research teams within English Universities (Nottingham, Cambridge, Reading, Newcastle) and Colleges (Askham Byran, Duchy). Under Professor Wilson's research leadership the consortium (Rural Business Research; RBR) has developed research methodologies and data collection and analytical approaches, and also delivered databases of national importance plus research reports, to Government within the competitively awarded Department for Environment, Food and Rural Affairs (DEFRA) funded Farm Business Survey (FBS) Research Programme for England. The FBS is the main source of data and intelligence on the economic performance of farm businesses in England. Over 1,750 farm businesses (approximately 3% of English farms) take part in the survey to provide detailed insights to Government representing the annual production, financial performance and productivity change of approximately 60,000 commercial English farm businesses. Farm businesses within the FBS sample are stratified by type, size and regional location; a range of information is collected, including data on management practices, agricultural production levels (e.g. crop yields), sales, costs, investments (e.g. in buildings, machinery and livestock) and support (e.g. subsidy) payments. The FBS data are used by DEFRA to develop and analyse the impact of agricultural policies and by researchers. The information has also been used in FBS linked applied agricultural and economic research projects by UoN's Professor Paul Wilson and Dr Stephen Ramsden. These research projects on environmental and economic trade-offs have identified opportunities for farmers to simultaneously increase productivity and reduce Greenhouse Gas (GHG) emissions through benchmarking approaches that demonstrate opportunities for farmers to reduce input use without large impact on yields. A further study analysed the influence of different farmer objectives, management practices and farm business performance that generated new insights into the link between farm management practice and performance. The FBS and other research programmes have together delivered key outputs that have underpinned the development of new evidenced-based UK agriculture legislation and policy required for the UK's exit from the European Union (EU).

DEFRA-funded Farm Business Survey (FBS) Research Programme
As an individual researcher, chair of DEFRA's FBS Technical Group (2006-) and lead of the FBS research grant (2009-) **(G1,G2)**, Professor Paul Wilson has undertaken, led and co-developed a range of research methodologies and approaches in agricultural economics. These include developing research protocols for allocating whole business fixed costs across individual business cost centres **(1)**; comprehensive analyses of agricultural labour use in English and Welsh agriculture **(2)**, and; analysis of agricultural enterprise gross and net margin cost sharing **(3)**. These research outputs and protocols underpin the FBS research programme that delivers the highly regarded independent datasets to DEFRA **(4)**. These annual datasets are recognised by industry and Government as being of national and international importance. Specifically, and of direct relevance for this impact case study, the data on farm business physical performance (e.g. crop yields) and financial performance (e.g. farm income) have been extensively used within the evidence base for the development of new agricultural policy legislation in England (Agriculture Act 2020) that was required given the UK's departure from the EU and the Common Agricultural Policy (CAP).

Understanding Environmental and Economic Trade Offs In Agriculture
Drawing on FBS data, Ramsden developed environmental-economic optimisation modelling approaches to determine farm-level adaptations to reduce agricultural greenhouse gas (GHG) emissions. The FBS linked research identified a range of farm management practices (changes in land use, etc) that could achieve relatively large reductions in GHG emissions at low financial cost to farmers. Importantly, from a policy perspective, certain management practices were found to be associated with least-cost reductions in GHG emissions **(5)**. The recommended good practices from the research, were found to be robust and representative across different farm types **(5)**. Building on **(5)** that identified considerable uncertainty in GHG emissions across individual farms within a single 'farm type', research funded under DEFRA's flagship Sustainable Intensification Platform (SIP) **(G3)** identified opportunities for farmers to simultaneously increase productivity and reduce environmental damage. Drawing on FBS data from representative dairy and cereal farms, the FBS linked research demonstrated the considerable variation that exists in GHG emissions per unit of product. Accordingly, this SIP research identified opportunities for using benchmarking techniques to improve resource use across farms, in particular through optimised use of fertilisers and 'concentrate' animal feeds **(6)**.

Understanding Behavioural Drivers In Agriculture
Recognising that farmers often have differing objectives affecting why, how and when they make business decisions, Wilson used DEFRA's farm behavioural segmentation approach to analyse the relationship between 'segmentation groups', farm management practices and the associated physical and financial business outcomes of these segmentation groups. This FBS linked research that drew on a sample of 750 farm business owners and managers identified a need for targeted development and implementation of agricultural policies to account for different farm business behavioural drivers **(7)**. Further research **(8)** funded under DEFRA's SIP **(G4)**, acknowledged the importance of behavioural drivers in decision making and explicitly analysed farmers' business management practices alongside their farm business performance (income); this identified that farmers who achieved higher profit were more likely to have undertaken environmental monitoring and management practices. They were also significantly more likely to have obtained further or higher education and to draw upon independent technical and business management advice. A specific output of the SIP report to DEFRA **(8)** from this research was that Government should invest in encouraging farmer uptake of business benchmarking.

Research Summary
As the UK prepared to leave the EU, UoN's leadership of the FBS research programme, and FBS linked research conducted by Wilson and Ramsden, have generated research outputs and datasets that provided **direct evidence that informed the development of new UK agriculture legislation and policy**.

3. References to the research
University of Nottingham UoA6 staff are **bold.**

Underpinning references:
1. **Wilson, P.**, Crane, R. and Robbins K. (2015). Methodology for the allocation and apportionment of fixed costs by cost centre. Report to DEFRA Farm Business Economics Division: Available at https://rb.gy/c2lbcm
2. **Wilson, P.** (2009). Analysis of Labour Usage Data from the Farm Business Survey 2004/05 to 2007/08. Report submitted to DEFRA Farm Business Economics Division. Available at https://rb.gy/3p5brh
3. **Wilson, P.** (2014). Review of Gross and Net Margins and Cost Centre Allocations in the Farm Business Survey. Reported submitted to DEFRA Farm Business Economics Division. Available at https://rb.gy/3p5brh
4. Farm Business Survey data is under the control 527 of the UK Data Service. The data is available upon satisfactory completion of a 528 Special Licence request with the UK Data Service at www.ukdataservice.ac.uk
5. **Gibbons JM, Ramsden SJ**, Blake A. (2006) Modelling Uncertainty in Greenhouse Gas Emissions from UK Agriculture at the Farm Level. Agriculture, Ecosystems and Environment, 112, 347-355. DOI: 10.1016/j.agee.2005.08.029
6. **Ramsden, S and Lynch, J.** (2016) Developing farm performance assessment methodologies. SIP WP1.1A Final Report submitted to DEFRA: https://rb.gy/3bzbms
7. **Wilson, P., Harper, N., Darling, R.** (2013) Explaining variation in farm and farm business performance in respect to farmer behavioural segmentation analysis: Implications for land use policies. Land Use Policy, 30 (1), pp. 147-156. DOI: 10.1016/j.landusepol.2012.03.006
8. **Wilson, P.** (2017) Analysis of Farm Business Survey 2011-12 Business Management Practices. SIP2 WP2.3A T3 Final Report submitted to DEFRA: https://rb.gy/baurqb

Underpinning grants:
G1. Farm Business Survey for England Grant. Sponsor: DEFRA, 2009/10-2017/18, ECM_1277. [redacted]. PI: Paul Wilson
G2. Farm Business Survey for England Grant. Sponsor: DEFRA, 2018/19-2020/21, ECM_53855. [redacted]. PI: Paul Wilson
G3. Sustainable Intensification Platform (1) Integrated Farm Management. Sponsor: DEFRA, 2014-2017, LM0201. GBP2,086,089. PI: Stuart Knight (NIAB), UoN Co-I: Stephen Ramsden
G4. Sustainable Intensification Platform (2) Delivering benefits at the landscape scale. Sponsor DEFRA, 2014-2017, LM0302. GBP2,025,095. PI: Michael Winter (Exeter), UoN Co-I: Paul Wilson

4. Details of the impact
Following departure from the European Union (EU) at the end of the Brexit transition period (31st December 2020), UK agriculture now operates outside of the Common Agricultural Policy (CAP). Consequently, UK government has developed new domestic agricultural legislation (Agriculture Act 2020) and outlined policies (The Path to Sustainable Farming: An Agricultural Transition Plan 2020-2024) that replaced the CAP from 1st January 2021. Independent evidence underpins UK government policy frameworks and, specifically, Department for Environment, Food and Rural Affairs (DEFRA) draws upon evidence from economic, social and operational research to address key questions facing agriculture. The UoN-led FBS research programme and UoN's FBS linked research have directly informed the development of the new agriculture legislation and policy.

FBS and UoN Research Provided an Extensive Evidence Base
The Agricultural Bill 2019-20 **(a)** was announced in the Queen's Speech on 19th December 2019. It was given its First Reading on 16th January 2020 and received Royal Assent on 11th November 2020, becoming the "Agriculture Act 2020". In line with other Parliamentary Acts, the Agriculture Act 2020 does not directly cite research but is supported by evidence collated from broad analysis and consultation. The Act is supported by two evidence packs **(b,c)** that drew heavily upon FBS data **(4)**; an updated evidence compendium **(d)** extensively utilising

FBS data **(4)**; and UoN's SIP reports to DEFRA **(6,8)**. The value of the FBS and Professor Wilson's expertise was recognised by the DEFRA FBS team leader, who stated:

> *"Specifically, without the FBS it would not have been possible to provide the depth of understanding and impact analyses that were produced within two evidence compendiums that support the [Agriculture Act 2020]"* **(e)**

In total UoN-led and co-produced research datasets and outputs, **provided 49% of the evidence that supported the development of the Agriculture Act 2020 that was required upon the UK's departure from the EU** (Table 1).

Table 1: Summary of FBS/UoN Evidence Sources Supporting the Agriculture Act 2020

Source	b	c	d	Total
FBS/SIP [primary source/reference]	22	16	28	**66**
FBS/SIP [secondary source/reference]	1	9	10	**20**
Total FBS/SIP	*23*	*25*	*38*	*86*
Total sources/references	34	53	89	**176**
Percentage FBS/SIP	68%	47%	43%	**49%**

Informing Agricultural Transition Arrangements

The Agriculture Act 2020, provides enabling powers for ministers to develop new approaches to farm support. Direct payments to farmers, in the form of Basic Payment Schemes (BPS) are currently based on the area of land farmed. This form of direct payment will be phased out in England between 1 January 2021 and 31 December 2027. This seven-year agricultural transition arrangement acknowledges the reliance of many farm businesses on the BPS. The underlying data that demonstrated the reliance of key farm types on the BPS **(d)** were taken directly from the UoN-led FBS datasets **(4)**.

Increasing Agricultural Productivity

The Agriculture Act 2020 makes provision for the collection and sharing of data to 'increase productivity' while 'The Path to Sustainable Farming: An Agricultural Transition Plan 2020-2024' notes that Government will "*Bring forward industry recommendations to improve the training offer to farmers and increase the use of business benchmarking*" **(f, pg.61)**. The UoN-led FBS provides a free to use farm business benchmarking service, developed and hosted by (Rural Business Research; RBR) consortium partners at Cambridge University. This benchmarking service has a user volume of approximately 47,000 visits per annum, totalling approximately 970,000 hits. Professor Wilson presented information on this free benchmarking service to the Agri-Food Council **(April 2016)**, a decision-making group that included representatives from primary production, processing and retail sectors, and DEFRA ministers and civil servants. This meeting raised awareness of the simple to use, free service and the benefits for users. Recognising the need to understand farmer behaviour factors as a driver for business decision making, Professor Wilson's SIP report to DEFRA **(8)** identified that farmers who achieved higher profits were more likely to have obtained further or higher education and also use business management advice. Furthermore, the report **(8)** recommended investing in enhancing managerial capacity through encouraging farmer uptake of business benchmarking. Professor Wilson also presented to a House of Lords Rural Economy Research Group **(October 2015)**, and provided written and verbal contributions to a House of Lords EU Energy and Environment Sub Committee enquiry examining Price Volatility and Agricultural Business Resilience **(December 2015)**, explicitly noting the importance of government supporting farm business benchmarking in increasing agricultural productivity. The resultant Lords report **(g)** cites Professor Wilson 8 times, Rural Business Research 8 times, and FBS results 7 times, including:

> "*A key determining factor of farm performance is the management ability of those individual farm businesses. Anything that allows farmers to access greater information - for example, benchmarking [...will help to] achieve a successful business."* [pg 52, para 259]. This statement was supported in the report with FBS data*: "the 2011/12 Farm Business Survey showed that 15% of farmers who frequently benchmark at whole farm level achieved an average Farm Business*

Income of £128,900 in contrast with £63,000 for the 85% of farmers that did not benchmark" **(g, pg.52, para 258)**.

One of the key recommendations in the Lords report was that:

"*Benchmarking in agriculture should be promoted among the farming community and encouraged by the UK Government. […] Farmers should share their data with their peers to facilitate this benchmarking.*" **(g, pg.52, para 261)**.

The importance of benchmarking was recognised in DEFRA's 'Farming for the future: Policy and progress update' in February 2020, stating "*the use of farm business data for benchmarking (comparing the performance of similar businesses) is accepted across all industries as essential to driving performance and efficiency*" **(h, pg.27)**. Moreover, 'The Path to Sustainable Farming: An Agricultural Transition Plan 2020-2024' notes that "*We will work with the Agriculture and Horticulture Development Board and the Agricultural Productivity Working Groups [APWG] Key Performance Indicators sub-group to create a consistent set of indicators for farm businesses to capture key financial performance and sustainability outcomes*" **(f, pg.62)**. Following a personal invitation from the Chair of the APWG, Professor Wilson joined the APWG working group developing these potential key performance indicators. Building upon UoN's SIP reports to DEFRA **(6,8)** a Sustainable Intensification (SI) benchmarking tool (focused on environmental and social data) was developed in conjunction with Cambridge University **(G4)**. A series of 10 knowledge exchange workshops were held with farmers, advisors and consultants from across England and Wales, to demonstrate the SIP benchmarking tool (environmental and social) and FBS benchmarking tool (business management) [47,642 'visits' / 971,897 'hits' 2019-20] **(i)**. A webinar tutorial was also developed [216 views].

Summary

In summary, the UoN-led FBS research programme, and specifically its highly regarded independent data sets, and FBS linked applied agricultural and economic research outputs, provided an extensive evidence base for the development of new domestic agriculture legislation and policy, following the UK's exit from the EU. Facilitating the use of UoN research outputs in policy development, a range of knowledge exchange activities have also been undertaken. Professor Wilson and Dr Ramsden's research and UoN delivery of the FBS programme have been recognised by DEFRA as of crucial importance to their agricultural policy development process, commenting "*the FBS data and intelligence reports provided by RBR have […] enabled us to create policies that will have positive impacts on the whole of UK agriculture upon the UK's exit from the EU. Professor Wilson's input via leadership of the FBS has been invaluable with regards to highlighting important issues in the current farming business landscape and how these can be addressed through policies in the [Agriculture Act 2020].*" **(e)**

5. Sources to corroborate the impact

a) Agriculture Act 2020 website and legislation [PDF] (accessed 13th November 2020)

b) DEFRA evidence compendium for Agriculture Bill, '*Agriculture Bill: Analysis of the impacts of removing direct payments*' (September 2018) [PDF]

c) DEFRA evidence compendium for Agriculture Bill, '*Agriculture Bill: Analysis and economic rationales for government intervention*' (September 2018) [PDF]

d) DEFRA evidence compendium for Agriculture Bill, '*The future farming and environment evidence compendium*' (September 2019) [PDF]

e) Letter of support from team leader of FBS in DEFRA (November 2020) [PDF]

f) DEFRA 'The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024' (November 2020) [PDF]

g) House of Lords 'Responding to price volatility: creating a more resilient agricultural sector' (16th May 2016) [PDF]

h) DEFRA '*Farming for the future: Policy and progress update*' website and report (February 2020) [PDF]

i) RBR Usage statistics FBS website October 2019–September 2020 (October 2020) [PDF]