

**Project number:** 6420

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## Knowledge Exchange for Extension



**Figure 1:** Adapted from Arnstein (1969)

### Key external stakeholders:

Advisers, farmers, DAFM, DJEI, EIP-AGRI

### Practical implications for stakeholders:

This project reached in-depth understandings of the actors, knowledges and processes involved in a) farm-level invention processes and products; and b) farm-level agri-environmental cross-compliance. As a result of these understandings, extension and policy approaches can be better coordinated and targeted. Results signal new knowledge exchange initiatives for enterprise & innovation support agencies and EIP-AGRI.

### Main results:

Farm-level invention processes and products:

- Farmers use their own tacit knowledge to invent a wide variety of time and cost saving products and processes
- Farmers' inventing processes are largely disconnected from mainstream enterprise and innovation support agencies, hindering sharing and commercialisation of their inventions
- Farmers often experience social derision as a result of their invention processes, highlighting the need for enterprise and innovation support agencies to publically recognise and generate esteem around farmers' inventing processes and inventions

Farm-level agri-environmental cross-compliance:

- Navigating, interpreting and understanding information available from multiple sources in relation to agri-environmental cross-compliance is a major challenge at farm level
- Teagasc's Cross-Compliance Workbook is perceived by farmers as a helpful and useful tool in achieving cross-compliance and in preparing for inspections
- Particular aspects of cross-compliance are identified as challenging to implement. This, coupled with inspections, causes considerable anxiety for farmers, which impacts negatively on the achievement of cross-compliance

### Opportunity / Benefit:

This research identifies farmers who invent as an important client-base for enterprise and innovation support agencies: the commercialisation potential of many farmers' inventions is unexploited and agriculture is in continuous need for time and cost-saving inventions, which is the primary orientation of UK & Irish farmers' inventions. Extension to support knowledge exchange between farmer inventors and other actors (industry, financial, enterprise) will assist in achieving sharing/commercialization of farmers' inventions. Where agri-environmental cross-compliance is concerned, challenges and needs at farm level must shape the design of extension and policy supports. Knowledge exchange to inform the co-design of practical tools is needed.

### Collaborating Institutions:

Open University, UK; Linnaeus University, Sweden.

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### 1. Project background:

Agricultural extension processes are essentially about knowledge and knowledge exchange. Sociological research has demonstrated that different forms of knowledge are at play in agricultural extension processes: farmers' knowledge, advisors' knowledge, scientists' knowledge and so on. The literature shows how interactions between these different forms of knowledge, and the nature of the social relationships that underpin them, are of critical importance in agricultural extension processes. Understanding the knowledge forms, knowledge interactions and social relationships at play in agricultural extension is central to shaping successful extension processes that give rise to practical and acceptable outcomes for farmers, the end-users. This project was designed to use Participatory Action Research (PAR) and in-depth qualitative and mixed methods research to understand and mobilise different forms of knowledge, interactions and relationships, in order to give rise to innovative solutions to farmer's technical and economic challenges through the extension process. The project evolved to focus on two areas: farm-level inventions; agri-environmental cross-compliance.

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### 2. Questions addressed by the project:

- How can different forms of knowledge, interactions and relationships be understood and mobilised in order to give rise to innovative solutions to farmer's technical and economic challenges through the extension process?
- How do the motivators of Irish farmers influence their approach to the invention process and what are the outputs and the learning communities involved?
- How can participatory interventions enhance extension programmes delivering mandatory agri-environmental policy by supporting extension personnel to work with farmers to uncover the factors affecting decision-making around prescriptive sustainable practices?

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### 3. The experimental studies:

For the study of farm-level invention processes and products, a mixed quantitative and qualitative methodological approach was employed. Content analysis (n=210) of publically available information on existing farmer inventions in Ireland and the UK was undertaken. The Biographic Narrative Interpretive Method (BNIM) was used to conduct qualitative case-studies of farmer inventors in Ireland (n=5), selected according to the extent to which their invention processes and products were integrated with external agencies, institutions, networks and peers. In-depth interviews (n=5) were undertaken with actors in innovation support and enterprise agencies.

For the study of agri-environmental cross-compliance, there were three empirical phases (or learning sub-systems). The first empirical phase involved a Participatory Action Research (PAR) intervention with advisory actors and farmers to investigate their interactions and use of Teagasc's Cross Compliance Workbook (McKenna, Hyde and Gibson, 2013). The second phase involved using the Biographic Narrative Interpretive Method (BNIM) to analyse farmers' experiences of implementing agri-environmental cross-compliance policy. A final phase examined using double-loop learning impacts of the research project on both organisational and individual learning among project participants (agricultural advisers, farmers and researchers).

#### 4. Main results:

The findings of the study on farm-level invention processes and products indicate that most farmer-inventors are principally motivated to invent by personal satisfaction from problem-solving. Farmer-inventors use their own tacit knowledge to create inventions that increase efficiency as a means to improve family farm viability. Despite efficiency usually indicating skilful farming, Irish farmer-inventors often face derision from other farmers who deem their inventing to be culturally inappropriate. Farmer-inventors with entrepreneurial intentions, willing to withstand such hostility, face financial and temporal constraints, while the help offered by innovation support and enterprise organisations is often inadequate. As a result, some inventions with commercial potential never reach the market. However, some farmer-inventors are members of particular communities of practice that support a shared farmer-inventor identity. Within these communities, farmers share their knowledge and inventions in social learning networks and accrue social status and reciprocal relationships. This research contributes to knowledge by extending user innovation theory and offering deeper understandings of farmer-inventors' social, cultural, and economic processes. It proposes farmers to be an underappreciated source of knowledge and inventions, offering low cost farm-level solutions to support family farm resilience. The potential for social learning within communities of practice is highlighted as a means of supporting farm-level invention processes and products.

Findings from the study of agri-environmental cross-compliance at farm level reveal significant potential for the use of a learning process approach to extension in becoming more responsive to farmers' preferences and circumstances when implementing prescriptive cross compliance measures. An example of such a learning process approach is Teagasc's Cross Compliance Workbook (McKenna, Hyde and Gibson, 2013), which interactively engages farmers in an incremental process. The findings include stakeholders' multiple suggestions of ways in which the design of agri-environmental cross-compliance measures could be altered to be more effective and implementable at farm level. However, farmers and extension organisations appear to have limited influence in the formulation of mandatory agri-environmental policies and in the design of associated measures.

#### 5. Opportunity/Benefit:

This research identifies farmers who invent as an important client-base for enterprise and innovation support agencies: the commercialisation potential of many farmers' inventions is unexploited and agriculture is in continuous need for time and cost-saving inventions, which is the primary orientation of UK & Irish farmers' inventions. Extension to support knowledge exchange between farmer inventors and other actors (industry, financial, enterprise) will assist in achieving sharing/commercialisation of farmers' inventions and the feasibility of such an approach is to be considered following this project's success at the Teagasc Open Innovation awards. Where agri-environmental cross-compliance is concerned, challenges and needs at farm level must shape the design of extension and policy supports. Using knowledge exchange to inform the co-design of practical tools is needed.

#### 6. Dissemination:

Dissemination is ongoing. Theses were examined in 2016 and the degrees of PhD were awarded subject to corrections submitted in 2017.

#### Main publications:

O'Flynn, P. (2017) *From Knowledge to Invention: Exploring User Innovation in Irish Agriculture*, PhD thesis, Faculty of Science, Technology, Engineering & Mathematics, School of Engineering & Innovation, Open University, Milton Keynes, UK.

Seale, C. (2017) *Learning How to Inform Extension Practices Related to Mandatory Agri-Environmental Policy*, PhD thesis, Faculty of Science, Technology, Engineering & Mathematics, School of Engineering & Innovation, Open University, Milton Keynes, UK.

O'Flynn, P., Macken-Walsh, A., Lane, A. High, C., (2016) The farmer-inventor: "good farmer" or undercover agent? Presentation to *XIV World Congress of Rural Sociology*, Toronto, Canada, 2016, August 10-14.

O'Flynn, T. (2016) The Unsung Farmer Inventor, *International Development Seminar*, 8 June 2016, Open University, Milton Keynes

Seale, C. (2014) Exploring Stakeholder Engagement with Cross Compliance, *Sociological Association of Ireland (SAI) Postgraduate Conference*, School of Political Science & Sociology Aras Moyola National University of Ireland, Galway 7th/8th March 2014.

Seale C. (2014) Cross-Compliance - Improving Farmer Engagement. *National Agri-Environment Conference*. Thursday, 13th November, 2014, Tullamore Court Hotel, Co. Offaly. [http://www.teagasc.ie/publications/2014/3366/AgriEnvironment\\_Conference2014.pdf](http://www.teagasc.ie/publications/2014/3366/AgriEnvironment_Conference2014.pdf)

Seale, C. (2012) Mediating 40 Shades of Green: A Participatory Action Research Approach in the Irish Agricultural Extension System, *AESI Early Career Researcher Seminar* 2012, October 19<sup>th</sup>, UCD Agriculture and Food Science Centre UCD, Belfield, Dublin 4

Seale, C. High, C. Lane, A., Reynolds, M. (2012) Forty Shades of Green: Implications for Knowledge Transfer under a Changed CAP, presentation to *Teagasc Best Practice in Extension Services: Supporting Farmer Innovation*, Aviva Stadium, Dublin, November 1st, 2012

#### Popular publications:

Hyde, T., Seale, C. (2014) Getting Set for On-Farm Inspections, *Today's Farm*, 32-33.

Seale, C. (2014) Cross Compliance Workbook Update, Teagasc, July 2014.

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#### 7. Compiled by: Áine Macken-Walsh

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