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Research article

Adoption of Farm Management Systems for Cross Compliance – An empirical case in Germany

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ABSTRACT

In Germany, Farm Management Systems (FMS) have been introduced as a support to farmers' compliance with environmental and other regulations, aiming at the increase of farm level performance and sustainable farming practices. Different kinds of FMS were developed and promulgated with various approaches, determined by each federal state's agricultural advisory system. Knowledge on the FMS' uptake and effectiveness has been lacking so far. The overall aim of this paper is to provide an analysis of the implementation process and selected outcomes of the policy-driven instrumental innovation of FMS. In particular, the objectives are i) to reveal how and with what success the introduction of FMS has been realised in Germany and ii) to analyse and discuss the FMS' adoption in the federal state of Brandenburg. For the first part of the study, we elaborate a situational analysis of the policy implementation through a desk study and expert interviews. In the second part, selected results from a farmers' survey in Brandenburg are presented and a switching regression model is developed to assess the factors responsible for the uptake of FMS and to understand the role of FMS in improving the confidence in complying with Cross Compliance regulations. We found a high degree of diversity among FMS developed in the different federal states. FMS adoption rates varied, but were generally low. Institutional environment seems to have a significant influence as the same FMS had very different adoption rates among federal states. For Brandenburg, our findings show that farmers' confidence to face CC check was increased by the adoption of FMS. However, counterfactual scenario analysis proved that especially farmers who did not adopt FMS would have benefitted most if they had adopted the tool. Our study shows that there is a need for systems supporting farmers in dealing with bureaucratic requirements. Future FMS should be easy to understand, adaptable to individual farmers' needs and be available at low costs. Furthermore, there is a need to design FMS in a participatory way that integrates farmers' expectations.

1. Introduction

The concept of 'Cross Compliance' in agriculture (CC) evolved as an economic measure in the United States. The term CC refers to attachment of certain regulations (e.g., environmental requirements) to direct payments under agricultural policy (Meyer et al., 2014). The European Union introduced CC in 2003 with the aim to increase farm sustainability, defining standards regarding the environment, food safety, plant (and animal) health and animal welfare, as well as the requirement of maintaining land in good agricultural and environmental conditions (GAEC). Farmers are obliged to comply with them, if they want to be eligible for the 'single farm payments'. These regulations include two elements: (1) The Statutory Management Requirements (SMR), which refer to almost 20 legislative standards in the field of the environment, food safety, animal (and plant) health and animal welfare and (2) the GAEC obligation, which refers to a range of standards related to protecting soil, maintaining soil organic matter and structure, avoiding the deterioration of habitats, and exercising water management practices (EC, 2003). Widely, CC was perceived as an additional challenge for farmers, given the already complex European farming regulations and documentation requirements as well as increasingly demanding quality assurance standards to be fulfilled for marketing of products. Not surprisingly, scepticism regarding the capacity of farmers to comply with CC regulations surfaced shortly after introducing the scheme. Policy makers

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expected that farmers will need support to introduce the CC requirements into their daily farm managerial routines (ADE, 2009a; Celio et al., 2014).

Along with the introduction of CC in the EU, how to support farmers to comply with CC was discussed (Schramm and Spiller, 2003; Entrup et al., 2007). Farm-Audit similar to quality assurance certification schemes emerged as a first idea within the CAP Mid-term review in 2002. Later, this idea was replaced by the concept of an obligatory 'Farm Advisory System' (FAS) for Member States and combined with increased public control of agricultural land use by establishing the 'Integrated Administration and Control System' (IACS) (Schramm and Spiller, 2003). Consequently, FASs were included within the regulation regarding CC and the Single Payment Scheme (EC, 2003), making the availability of advisory services on CC standards binding for all EU member states by 2007.

1.1. Implementation of CC & FAS in Germany

The implementation of FAS in the EU member states was initiated by the rural development authorities and took place within the existing institutional settings at national or regional level. Largely, it resulted in two distinct organisational forms: (i) in a number of states, the FAS were newly established in parallel to existing agricultural advisory systems (e.g. Bulgaria or Hungary) while (ii) in other countries existing agricultural advisory systems were updated and complemented with the 'FAS' component (e.g. Germany, Netherlands, Denmark). An evaluation of the policy implementation at member state level was conducted (ADE, 2009a) shortly after their implementation at member state (MS) level. Despite limited evidence, this evaluation came to the conclusion that FAS contribute to awareness raising among farmers, of material flows and on-farm processes related to environmental, food safety or animal health aspects, and that they support the implementation of CC requirements. Furthermore, the core approach of on-farm, one-to-one advice based on checklists (in 18 MS implemented by 2008) was assessed to be particularly effective compared to off-farm or one-to all approaches (ADE, 2009b). Apart from this initial assessment, little is known so far about results and impacts of FAS on CC as there has been no second evaluation since 2009. A recent overview study on European agricultural advisory services as one key actor for farmers' access to relevant and reliable knowledge concluded that the data available to evaluate the impact of the advisory services (Knierim et al., 2017) is insufficient for meaningful assessment, a situation that is reported to prevail broadly in OECD countries (OECD, 2015).

Together with Great Britain, Italy and Belgium, Germany is one of the few European countries where the implementation of agricultural advisory systems is mandated at a regional (state) level, which resulted in considerable institutional diversity (Hoffmann et al., 2000). In addition to this diversity and in contrast to all other EU member states, the German implementation of FAS was combined with the dissemination of farm management systems (FMS). In this context, an FMS is defined as "an instrument for systematic documentation and analysis of production processes, aimed at continuously improving overall farm performance" (BMELV, 2006:1f). Strengthening of farm-level self-control and optimisation process through FMS became a political priority as manifested in a national subsidy scheme called 'Framework plan for the joint task of improving agricultural structure and coastal protection' (GAK) (BMELV, 2009; Boland et al., 2005). FMS was assumed as a facilitating agent of farmers' compliance to CC and consecutively, public support for CC related farm advice was linked to the introduction and implementation of this instrument. The national ministry for Agriculture (BMELV) recommended the implementation of FMS to the federal states. Depending on the state-level advisory system, FMS were developed by public institutions, agricultural chambers or independent private consulting companies. Between 2007 and 2013, the national FAS policy provided financial support for advisory services combined with FMS. It ended with the start of the new CAP period (2014–2020) and app. 15 Million Euro were spent (BMEL, 2017).

Thus, we frame the introduction of FMS in Germany as a policy driven innovation process in the agricultural sector aimed at increasing farm sustainability (Herrera et al., 2016). As farmers' adoption of environment-related instruments and practices is a complex process, usually influenced by a broad range of socio-structural and situational determinants (Siebert et al., 2006; Burton, 2014), we consider the German setting a unique occasion to study a policy-driven instrumental innovation.

1.2. Objectives of the study

The overall aim of this paper is to provide an analysis of the process and outcomes of the policy-driven instrumental innovation embodied in FMSs that targeted enhancement of farm level performance and sustainability through ensuring CC. Based on review of policy documents and current literature, we elaborate the aims and characteristics of FMS as defined within the German policy framework and categorise them within the context of agriculture-related management systems. Additionally, the state of empirical evidence and discussion on factors influencing farmers' FMS adoption is summarised. The current work investigates whether farmers' modified behaviour with regard to (CC) is indeed related to the adoption of a new information management tool. We use qualitative and quantitative data from a German case study on FMS and CC-related advisory services generated from expert interviews and a farmers' survey.

The objectives are i) to reveal how and with what success the introduction of FMS has been realised in Germany and ii) to specifically analyse and discuss the impact of FMS' adoption in ensuring CC in the German federal state of Brandenburg. For the first objective, we adopt an explorative approach and elaborate a situational analysis of the policy implementation. Specific research questions addressed are: (a) with what measures and methods did the state-level, agricultural advisory services develop and implement FMS, and (b) what adoption results were reached? For the second objective, we present an in-depth analysis of factors determining the adoption of FMS in Brandenburg. The specific research questions addressed here are: (c) what determined the adoption of FMS and (d) did FMS contribute to enhancing CC?

2. Conceptual background of FMS adoption

2.1. Farm Management Systems – aims and characteristics

The term 'farm management system' as used in the German subsidy scheme (BMELV, 2009), is not defined in scientific literature so far. Table 1 gives an overview – based on literature and expert interviews - of the most important farm management related systems, their aims and characteristics, and examples. While common denominators are their ordering and control functions, they are specific with regard to whether they address the whole or only parts of the farm's management with an aim of either supporting internal management or external transparency creation, or both.

Within the German subsidy scheme, FMSs (row 1 in Table 1) are defined as systems to support self-control of farm enterprises and to improve overall farm performance. The use of FMS is supposed to increase quality of products and processes, to ascertain the traceability of products, improve animal welfare and protection, to