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Farm-level viability, sustainability and resilience: a focus on co-operative action and values-based supply chains

This paper presents a critical discussion of the concepts of farm-level viability, sustainability and resilience, which are typically discussed separately in the literature. While farm-level viability frequently focuses on measurable economic factors, sustainability is comparatively more elusive because of its added social, cultural and ecological dimensions. Resilience, in turn, is unambiguous in the sense that it requires particular conditions, but is achieved in dynamic ways. A traditional resilience strategy in agriculture globally is co-operative action, involving farmers working together to enhance their viability and sustainability, often achieving resilience. We draw attention to agricultural development models that are distinctive because they leverage co-operative action in and between family farms in agricultural communities while pursuing integrated viability, sustainability and resilience strategies. We focus on the prospect of such rural development models, particularly a values-based supply chain approach, and identify crucial considerations and future research needs.

Keywords: viability, resilience, sustainability, co-operatives, family farms, values-based supply chains

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Introduction

Agricultural sustainability is positioned at the core of political debate on global challenges such as food security, energy security and climate change. Regions within the European Union (EU) and elsewhere are experiencing pressures to address these challenges. Recent reforms of the Common Agricultural Policy (CAP) and individual EU Member State policies, such as Ireland's *Food Wise 2025*, seek to increase the value of the agri-food industry by furthering process and product innovation while adhering to principles of 'Smart, Green Growth' (DAFF, 2010, p.4). Within such policy rhetoric, tensions can arise between economic goals (e.g. increasing agricultural output), social goals (e.g. preserving rural population density and diversity), and environmental goals (e.g. protecting ecological land health) (Barbieri and Mahoney, 2009; Selvi *et al*., 2012). It is recognised that family farms are pivotal actors in the agriculture sector and, globally, are challenged with furthering economic, social and environmental development goals in an integrated way (Piedra-Munõz *et al*., 2016). While there is no universal definition for family farms, defining criteria usually relate to a reliance on family members in providing labour and the intergenerational transfer and ownership of the farm business (Gasson and Errington, 1993; Bjørkhaug and Blekesaune, 2008).

Family farms are noted to be particularly tenacious, despite often experiencing low economic viability (Saraceno, 2013). Charting routes towards farm viability remains a central research and policy challenge; however, viability represents just a narrow component of broader sustainability goals. Farms that are economically viable can nonetheless face serious threats such as insufficient incorporation of social and environmental sustainability concerns to their business models that are necessary to survive in the long term (Hennessy *et al*., 2008). On the other hand, many farms that are categorised as economically unviable have high social and environmental sustainability attributes and can demonstrate remarkable resilience. Such farms are often resourced by strong social and cultural capital within the farm family and farming community, as well as alternative economic resources such as off-farm employment (Hill, 1993; Hennessy and Rehman, 2008; Darnhofer *et al*., 2010b; Davidova *et al*., 2013; Cush and Macken-Walsh, 2016; Sekabira and Qaim, 2017).

The interchanges between theories of viability, sustainability and resilience are the central focus of our paper, which mainly draws on Irish and European contexts but is broadly relevant to developed countries worldwide. Firstly, we discuss the concept of farm-level viability, which is typically focused on measurable factors. We then discuss the broader concept of sustainability, which is comparatively more elusive in its social, cultural and ecological dimensions. Our discussion then turns to the concept of resilience, which, although is unambiguous in the sense that it must fulfil particular conditions, can be achieved in dynamic ways. We argue that understanding the distinctions between farm viability, sustainability and resilience and their interchanges is supportive to effective agricultural development policy design. Through the lens of the conceptual framework presented in this paper, we discuss two main agricultural development paradigms that rely on co-operative action in the promotion of integrated farm viability, sustainability and resilience.

Farm viability

Economics is the dominant discipline in discussions of farm viability, where quantitative methodologies are typically used to measure universally-applicable indicators across a wide variety of farm types and contexts (Seghezzo, 2009). Family farm income (FFI) is a central determinant of farm viability and can vary due to differences in farm size, specialisation, output and access to off-farm income, among other factors (O'Brien *et al*., 2008). Frawley and Commins (1996) define farm viability as providing the average agricultural wage for family labour in addition to providing a 5 per cent return on non-land assets. O'Donoghue *et al*. (2016) outline several definitions of viability across a range

of countries in the global north (see Table 1 on p.164), but it is recognised that in the global south different measurements are used to conduct viability analysis (Saravia-Matus and Gomez y Paloma, 2014). Even within these different viability measurements there are different types and varying degrees of market integration (Tisenkopfs *et al*., 2017), further complicating viability measurement. For instance, while small farms can struggle with viability due to restrictions on scale and thus output, semi-subsistence farms only sell part of their output and retain significant proportions for their own needs (Davidova *et al*., 2013; Tisenkopfs *et al*., 2017).

The problem of poor economic viability of farms is a global issue (Weis, 2007). Focusing on farm viability in the United States (US), a phenomenon termed as 'bifurcation' refers to the expanding number of large farms producing undifferentiated commodity products on one the hand and, on the other, the expanding specialist premium foods sector. Implicated in this bifurcation is the loss of medium and small family farms that are neither sufficiently large to compete in the undifferentiated commodity markets nor adequately specialised to compete in premium food markets (Kirschenmann *et al*., 2008). Kirschenmann *et al*. (2008, p.3) state that, in today's market, mid-sized farms operating alone are particularly economically vulnerable because they are too small to compete in and provide sufficient volume of product in 'highly consolidated commodity' markets and too 'conventional' to supply direct speciality food markets. This decline in the number of farms across much of the world is a problem that is not determined solely by scale but by market structures.

Porter (1990) highlights two main routes to being competitive in a global economy and states that, while not impossible, it is difficult to pursue both routes: being the lowest cost supplier of an undifferentiated commodity or providing the market with unique and superior value in terms of product quality, special features or after-sales service. While economic viability is one helpful indicator of whether family farms are likely to survive into the future, an understanding of other indicators is also influential, explaining why so many family farms have remained in operation in the long term despite low economic viability. The broader concept of sustainability, which will now take our focus, goes some way towards understanding these wider dimensions.

Farm-level sustainability

Sustainability is frequently referred to in national and international policies that attempt to balance economic priorities with social issues, while safeguarding ecological conditions (Seghezzo, 2009). However, the concept of sustainability remains controversial as few policy regimes succeed in achieving the requisite balance between social, economic and ecological priorities. Definitions of sustainability are diverse and fluid according to different actor perspectives, creating challenges for the mainstreaming of sustainability mandates in political and civil structures. Because the sustainability concept is open to wide interpretation, it is argued that it can become bland in meaning, devoid of a coherent theoretical framework and clear means of practical realisation (Giddings *et al*., 2002).

It is accepted overall that sustainable agriculture is multifaceted, responding to pressing economic, environmental and social challenges (van der Ploeg and Marsden, 2008; Piedra-Munõz *et al*., 2016). Numerous 'buzzwords' with sustainability connotations have become mainstreamed in agricultural discourses, relating to both agricultural processes and products, for instance: 'environmentally sensitive', 'sustainably intensive', 'extensive', 'ecological', 'community', 'organic' and 'free range' (Pretty, 2008).

Methods of measuring sustainability are evolving (Dillon *et al*., 2010; Dillon *et al*., 2016), going beyond measurement of FFI which is acknowledged as failing to provide an "accurate indicator of the long-term sustainability of farming as it does not account for the level of resource utilisation on farms, nor does it account for the farm household's reliance on farm income" (Hennessy *et al*., 2008, p.35). The inclusion of social and innovation indicators of sustainability coincides with increasing emphasis of EU policy on the vital role of social networks in rural areas. Family farming is crucial to the maintenance of social capital and the economic, social and cultural fabric of rural areas (Hill, 1993; McDonagh, 2013). Social indicators of sustainability such as the demographic viability of households and social isolation are salient issues in many agricultural communities, where a reliance on family farms to retain rural population and services is highlighted across the third and public sectors (Shucksmith and Rønningen, 2011; Dillon *et al*., 2017). Additionally, it is claimed that intergenerational family farmers' knowledge of local production conditions makes them an intrinsic part of the sustainability agenda (Calus and Huylenbroeck, 2010). Macken-Walsh (2011, p.182) cites Kirschenmann and Stevenson (2004) who, in a US context, highlight practical reasons why family farming is valuable, arguing: "this is not just about "saving" the family farm. It is about the associated social, economic, and environmental costs to society. With the loss of each family farm, a rural community loses approximately USD 720,000 in related economic activity. Ecologists now affirm that the only way we can manage farmland in an ecologically sound manner is by having the farmer living on his/her land long enough and intimately enough to have learned how to manage it properly. With the loss of ecological land health, we see the loss of soil quality, wildlife, and recreational areas. And with the loss of rural populations, the loss of public services – education, health-care, transportation – inevitably follow".

Family farms are recognised as fundamental to the functioning of rural society (Hill, 1993; Delgado *et al*., 2003; Woods, 2011; Davidova *et al*., 2013) with over 12 million operating across the EU, according to Eurostat data. However, the vast majority of these family farms are dependent on EU subsidies to survive economically (Shucksmith and Rønningen, 2011; Woods, 2011; Davidova *et al*., 2013; McDonagh, 2013), yet they are proving to be tenacious. Measurements of viability and concepts of sustainability often fall short in explaining this tenacity, despite economic vulnerability, and it is in this context that we turn to the concept of resilience for its explanatory value.

Resilience

Resilience is defined as "the capacity of a system to absorb disturbance and reorganise while undergoing change so as to easily retain essentially the same function, structure, identity and feedbacks" (Walker *et al*., 2004, p.2). Resilience incorporates three main features: persistence, adaptability and transformability (Folke *et al*., 2010). Resilience not only implies the ability to bounce back from a disturbance but also adaptive capacity (adaptability) and transformative capacity (transformability) in maintaining system stability (Walker *et al*., 2004; Darnhofer *et al*., 2010b; Folke *et al*., 2010).

Resilience is impossible to measure or quantify (Buchmann, 2010). However, measurements of viability and sustainability may be used to gauge proxies of resilience such as adaptive capacity. Membership of cultural institutions, social capital, financial capital, systems of governance and resource availability are all determinants of the ability of farmers to achieve resilience (Buchmann, 2010). Various characteristics of resilience have been identified, including (a) learning to live with change and uncertainties, (b) nurturing diversity for reorganisation and renewal, (c) combining different kinds of knowledge and (d) creating opportunity for self-organisation (Folke *et al*., 2003).

Ungar (2008) draws attention to an ultimate characteristic of resilience, which is the ability to respond effectively to a threat or situation of adversity (Macken-Walsh and Byrne, 2014). It follows, therefore, that a precondition for recognising resilience is the presence of a threat or situation of adversity, which in turn catalyses responses in the form of new action(s) and/or the leveraging of new resources, whether material or non-material. Often these shocks and disturbances that trigger resilience may be viewed as 'windows of opportunity' (Folke *et al*., 2003). In understanding the resilience strategies of farm families, attention must be paid to the social domain of the farm family and, specifically, to the power-dynamics and relationships between family members and how different members can influence decision-making in relation to farm development (Darnhofer *et al*., 2010a; Macken-Walsh and Byrne, 2014). As noted by Vanclay (2004), farm family decision-making is not entirely informed by profit maximisation but by broader social and cultural goals and values. Farm families' reluctance to take financial risks that may jeopardise social and cultural forms of capital (such as ownership of the inter-generational farm) is attributed to their peculiar tenacity and resilience by comparison to industrial farms (Galdeano-Gómez *et al*., 2016; Macken-Walsh and Byrne, 2014).

Flexibility and adaptability, by adopting new organisational strategies and production methods, has aided the resilience of farms across the EU (Macken-Walsh and Roche, 2012). Parts of this literature focus on how the adaptability of farms depends not only on the farm and its components (resources, workers etc.) but also on the ability to mobilise resources outside of the farm (Almås, 2010). Darnhofer *et al*. (2010a, p.550), citing Chia (2008), assign the term 'relational reflexivity' to the process of mobilising or utilising external resources outside of the farm unit to increase resilience, focusing specifically on collective action. This resonates with a growing literature on collective action, within farm families and between them, as a strategy of resilience in family farming (Kirbak and Egil, 2005; Almås, 2010; Ingram and Kirwan, 2011; Macken-Walsh and Byrne, 2014).

Co-operative action as a model for family farm viability, sustainability and resilience

The co-operative is defined as "a self-help business, owned and democratically controlled by the people who use its services and share in its benefits" (Briscoe and Ward, 2006, p.10). Historically, the co-operative is a strong and enduring institution of the agricultural economy (Fulton and Hueth, 2009), combining economic and social goals (Briscoe *et al*., 1982; Bijman *et al*., 2016). Agricultural co-operatives have emerged to counteract the power disparities of the market place (Kirschenmann *et al*., 2008; McCarthy *et al*., 2010), and they play an important role in providing farmers with better access to markets, enabling them to improve overall efficiency, securing a higher share of the product value by creating scale, pooling market risks, and allowing for the development of product and market innovation (NCFC 2005, in Ortmann and King, 2007; Fulton and Hueth, 2009; Bernard *et al*., 2010; ICA, 2015). Co-operatives can build resilience to market volatility especially in times of economic crisis (Birchall and Ketilson, 2009; Wanyama *et al*., 2009), and are seen to perform particularly well in higher-value markets (Merel *et al*., 2009; McCann and Montabon, 2012).

Co-operation is, in its own right, an adaptation (Walker *et al*., 2004), potentially facilitating people to improve their quality of life and to enhance their viability, sustainability and resilience through social organisation (Hooks *et al*., 2017; Ortmann and King, 2007). The co-operative model must be adaptable as a resilience strategy in meeting members' viability and sustainability needs and to the design of the processes and products that meet these needs.

The 'Agriculture of the Middle' (AotM) movement (Kirschenmann *et al*., 2008) is a contemporary co-operative development model that emphasises the need to transition from a supply chain approach to a Values-Based Supply Chain (VBSC) chain approach. The term 'supply chain' places focus on the "costs and efficiencies of supply and the flow of materials from their various sources to their final destinations" (Feller *et al*., 2006, p.4). The term 'value chain' or VBSC focuses on the creation of added value within a chain, and the roles of different actors in the chain in creating value. Incidentally, VBSCs are also defined by a distinct commitment to the welfare of all partners in the supply chain, including principles of equitable profits, equitable wages, and business agreements of appropriate extended duration (Stevenson *et al*., 2011). An AotM VBSC involves cooperation between farmers and other actors (including processors, retailers and consumers) in bringing family farm produce to the market. A central aim of VBSCs is that farmers transition from the role of 'input suppliers' to 'part owners' of the chain (Kirschemann *et al*., 2008). In addition to the critical importance of forging values-based multi-actor relationships, this

transition in the status of the family farmer in the food chain is identified as a necessary foundation for developing family farm viability, sustainability and, ultimately, resilience.

AotM (Figure 1) emerged in the context of a 'bifurcation' of US farm structures, resulting in the loss of 'middle' family farms. The increasingly poor economic viability and losses of 'middle' family farms annually is explained by their lack of scale in competing with large, efficient producers of undifferentiated commodity products on one hand and their lack of differentiation by comparison to 'boutique' producers of branded speciality foods on the other (Kirschenmann *et al*., 2008; Kirschenmann, 2012). These underpinning causes of the bifurcation problem in US farm structures are evident worldwide, prompting debates about the future of family farms and wider sustainability issues (Davidova *et al*., 2013).

The loss of family farms, according to authors of the AotM literature, has negative economic, social, cultural and ecological impacts on society and such arguments are echoed in multiple national and international studies in the EU (EC, 1988; Phelan and O'Connell, 2011; Shucksmith and Rønningen, 2011; Forney and Stock, 2014). A primary concern of the AotM model is to harness the socio-cultural and ecological branding capital of family farms as a route for enhancing the market value of farm products and services. Family farm produce is identified as having competitive advantage in the space between commodity and specialised food products as there is a "burgeoning market demand for foods – neither cheap commodity foods or luxury expensive speciality foods – that are somewhere in the middle and are produced in accordance with sustainable agriculture standards. It is precisely the farmers of the middle who are in the best position to produce those products" (Kirschenmann *et al*., 2008, p.4). In more developed societies, there has been a mass social movement away from the consumption of undifferentiated commodity products towards foods with provenance attributes (Ilbery and Maye, 2005; Dilley, 2009; Moore *et al*., 2014). From consumers' perspectives, foods imbued with the social, cultural, economic and ecological benefits that non-intensive family farms deliver to society are increasingly desirable (Bell and Shelman, 2010).

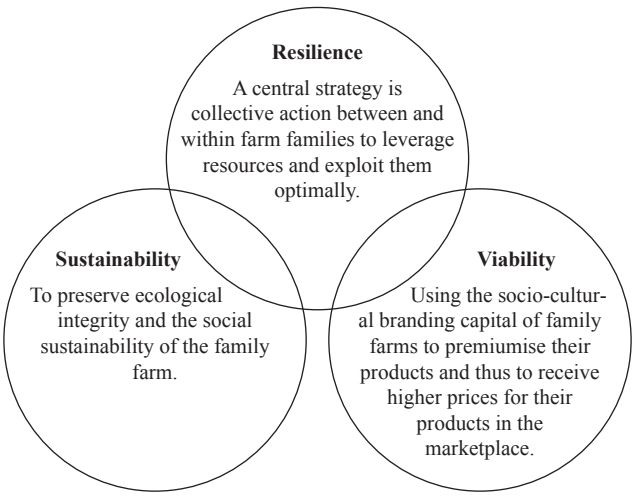


Figure 1: The AotM development model for family farms.
Source: own composition

Such a rationale is consistent with international agricultural development models such as the New Paradigm of Rural Development (NPRD). NPRD arose out of the rural development era of the European Union's agricultural policy when there was a realisation that there was a need not just to support agricultural production but also to support 'consumption' of rural areas. It is similar to the AotM model in how it offers an alternative to mainstream commodity agricultural production and draws on co-operative action and sustainability as core principles (Tovey, 2006). Tovey (2006, p.173) explains that NPRD "restates rights and possibilities of rural inhabitants to generate a livelihood for themselves from a sustainable use of the natural, cultural and social resources specific to their own rural locale". Instrumental stages in the realisation of NPRD include the deepening, re-grounding and broadening of agricultural production processes (Van der Ploeg *et al*., 2000) as a means of adding value. Similar to AotM, the realisation of NPRD is dependent on both the cultural and sustainability attributes that food products embody and the empowerment of actors (and relationships between them), which are so critical for resilience.

Conclusion

This paper reviews the literature defining family farm viability, sustainability and resilience, identifying key indicators of farm viability and sustainability and conditions for resilience. While farm viability and sustainability are important for family farms to survive, resilience is most deterministic of long-term survival. Underpinning family resilience is a capacity to leverage resources within and outside the farm family, necessary to respond to shocks and threats to farm viability and sustainability in the short and long terms. In this context, agricultural development policies informed by motivations to achieve farm viability and/or sustainability alone appear insufficient.

The co-operative model is theorised as capable of simultaneously enhancing viability, sustainability and resilience. An agriculture development model that is fundamentally based on principles of co-operation is presented in this paper: Agriculture of the Middle. Adopting a VBSC approach, value is added to products through production processes which adhere to principles of ecological, social and cultural integrity, increasingly sought after by consumers/ 'food citizens'. Principles of fairness and commitment demonstrated by contracts between chain partners, often including consumers, form an important part of the marketing strategy. This route toward economic viability culminates in farm families 'deepening' and 're-grounding' their production processes in socio-cultural identity and ecological integrity in order to receive a higher price for their product. Such an approach represents an alternative to scaling up in size and production output and is consistent with sustainability goals.

The review of the crucial inter-relationships between farm viability, sustainability and resilience presented in this paper highlights that it is prudent for agricultural development models to be focused on all three concepts. AotM is reviewed as one such model which demonstrates a balancing and mutual reinforcing of viability, sustainability and

resilience goals. However, AotM has only in recent years been transposed to the EU context and discussions of such applicability in the EU context are emerging just now in the literature (Fleury *et al*., 2016; Hooks *et al*., 2017). Pertinent research questions are how the triad of viability, sustainability and resilience concepts remain integrated in practice and, crucially, how they are achieved at the level of family farms.

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