Farming without farms? Challenges for organisational behaviour research in an upcoming transformation process

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Received 27 December 2022
Revised 30 August 2023
30 October 2023
22 December 2023
Accepted 31 January 2024

Abstract

Purpose – The paper intends to show why farms as we know them today may soon be a thing of the past and that organisational behaviour research has an important contribution to make in assisting the upcoming transformation.
Design/methodology/approach – Two strains of literature are reviewed and then synthesised: the literature on robots replacing humans in agricultural production and the literature on vertical integration that shifts decisions to agribusiness. Then the potential contribution of organisational behaviour research is outlined.
Findings – It is shown how the farm is likely to lose both roles for which their geographic entity is important: making decisions and carrying out production. This requires contributions from organisational behaviour research in the realms of decision designs and social systems.
Social implications – It can be anticipated that the most profitable strategy for farmland owners in the future will be collaboration with contractors. Farms as organisations, are increasingly losing their importance. This not only has grave social implications for farmworkers and landowners but also for scholars in organisational behaviour research.
Originality/value – The paper challenges an organisational unit that is so familiar to us that it is rarely questioned.

Keywords Institutional economics, Contractors, Farm
Paper type Research paper

1. Introduction

Since agriculture emerged around 10,000 years ago, the organisation of the farm has been linked so inextricably to it, that the term was, in fact, transformed into "farming" as a synonym of agriculture. As soon as societies of hunter-gatherers decided to grow crops and keep animals in a systematic way, their houses in which, probably, many relevant production decisions were made, could (and would) be considered as farmhouses (Brink, 2013).

This paper aims to convince readers that a lot of contemporary developments like the growing role of contractors in agriculture (Birner *et al.*, 2021), the trend towards vertical farming (Bogachev, 2015) or the rise of self-driving tractors (Ghobadpour *et al.*, 2022) are phenomena that are due to the fact that the existence of farms is not inextricably linked to agricultural production. Farms are not merely firms that invest in agriculture. Therefore, this paper develops and defends the position that, whilst firms will as much prevail as the agricultural sector will, there are strong indications that farms as we know them may soon lose their importance, giving way to other institutional forms more suitable to manage agricultural production.

This argument is going to be developed in the remainder of this paper. For this purpose, it is first to be shown that the claim requires intellectual inputs from more than one discipline

International Journal of Organization Theory & Behavior
Vol. 27 No. 1, 2024
pp. 1-13
Emerald Publishing Limited
1093-4537
DOI 10.1108/IJOTB-11-2022-0219

(Section 2). Section 3 will then describe the definitional characteristics of a farm and explore the reason why the farm has evolved as a transaction cost-saving organisation. Section 4 and 5 will then highlight the two constituting characteristics of farms in the face of our changing environment. Likely alternatives to the organisational form of the farm will be sketched in Section 6 before Section 7 introduces the necessary contribution of organisational behaviour research and Section 8 concludes.

2. An interdisciplinary framework for predicting organisational changes

It has been remarked by Jacobs *et al.* (2013) that the prediction of organisational changes requires to cross disciplinary boundaries. This does certainly apply for the claim that the organisational unit of farms is losing importance, because it is characterised through the simultaneous decision-making and production processes on one geographical spot, something that is becoming obsolete due to technological and societal developments. To develop this claim, it is certainly helpful to rely on two major historic schools of thought.

One of them is transaction costs economics. After Coase (1937) proposed that firms exist because such units save transaction costs as compared to mere market transactions, many scholars used transaction cost arguments to explain and predict organisational choices (Jablonowski and Kleit, 2011; Vega and Keenan, 2013; Bigelow *et al.*, 2019). This applies also to agriculture, where transaction costs economists have repeatedly justified the existence of farms (Hobbs, 1997; Brem, 2002; Miljkovic, 2005; Demir, 2016). Allen and Lueck (1998), for example, have argued that seasonality and natural randomness are factors that make small family farms a superior organisational choice.

Woodward's (1958) contingency theory is a second important historic asset. It acknowledges that different types of organisational structures are appropriate for different kinds of situations. It is the strength of this strain of research that it emphasises the organisational changes that almost necessarily follow from different circumstances (Donaldson, 1996; Ellis *et al.*, 2002). Shenkar and Ellis (2022) name several conceptual issues, where the contingency theory offers more refined analyses than the transaction cost theory, such as a better distinction between different categories of uncertainty.

The broad field of organisation studies is strongly interlinked, of course, with these two schools of thought. In the case of transaction cost economics, Grandori (2023) has recently claimed that the transaction cost theory had integrated organisation science with economics and other basic social sciences. The contingency theory has even been described as forming a part of organisation science (Schreyögg, 1980).

As will be shown in the following sections, the claim that farms as an organisational solution are increasingly losing their competitive advantage, and will be underscored by these three interrelated disciplines: It will need transaction cost economics to show how alternatives to the farm will manage to save transaction costs. It will need the contingency theory to show the adaptive potential of actors, and it will need organisation science to sketch potential pathways for transformation. Shaw *et al.* (2018; p.1) suggest that three motivations for cross-disciplinary theorizing in management science exist: "(1) to solve a puzzle in the management literature, where no adequate explanation exists and/or (2) to explain a recurring pattern of findings or "stylised facts" that have appeared in the management literature or elsewhere and/or (3) to offer a new way of seeing an existing issue or phenomenon". We claim that the link between the transaction cost economics, contingency theory and organisation science is motivated by their third option: it needs the three disciplines to predict the vanishing importance of farms.

Should farms lose their importance as organisational unit, literally billions of people are affected and will have to adapt. This signals particular relevance of organisational behaviour as a sub-discipline of organisation studies, and it will be outlined below how this school of thought can contribute to make the upcoming transition a successful one.

3. The nature of the farm

The existence of farms is such a matter of course for us that little effort has been put into a proper definition of them. Most entries in encyclopaedias run along the line of the Collins Dictionary that states that "A farm is an area of land, together with the buildings on it, that is used for growing crops or raising animals, usually in order to sell them". The reference to farm sales points to the farm as an economic unit, an important first characteristic. However, the shortcoming of this definition is illustrated in Figure 1 which shows an "area of land" with "buildings on it", which, according to the dictionary's definition, would qualify as a single farm. Our intuition, however, would probably rather suggest that we see two (admittedly identical) farms, at least if the depicted landscape is situated in an area characterised by a culture of family farms. This indicates that the definition cited neglects farms as an organisational decision-making unit. In each of the two farmhouses that we can see in Figure 1, we would expect that there are persons who would work on the farm and make managerial decisions for this work. It is a characteristic of a farm that it is also a firm; a hierarchically constructed decision-making unit and quite a large strain of contemporary rural sociology literature that also makes use of organisational studies, is currently devoted to better understand these farming decisions (eg. Gustafsson and Hallström, 2018; Sell and Minot, 2018; Bjornlund *et al.*, 2019; Acosta *et al.*, 2020).

The definition in the Collins dictionary, however, also has its merit in that it makes the differences between a firm and a farm clearer. Firms are often, but not necessarily connected to a piece of land and/or building. Venture capital companies, for example, may have some headquarter in some building, but their main characteristic is their engagement in a number of different enterprises that also may exist rather detached from land and buildings (Metrick and Yasuda, 2021). A farm, however, is not a farm if it does not have either farmland or a stable with animals. A farm always has certain physical characteristics that provide their main base of resource and usually, in connection with the people working there, also constitute a social unit. This applies to large, commercial farms as well as to poor smallholders, who mainly feed their own household. A farm definitely has a stronger geographical component than most other firms, a fact that underscores the claim of contingency theorists that the organisational design follows geographic necessities (Golembiewski, 2000).

Taken together, a farm has a double nature, and all research about farms implicitly assumes this double nature. On the one hand, it is a hierarchical setting like any company, even though the magnitude of the hierarchical structure is usually on the small side. And on the other hand, it is a physical entity for production processes being based on either land or stables or to put it in a more practical way: we currently need farms because they provide a structure for people who make production decisions and who realise them in the stables and on the farmland. The claim that farms may soon lose their prominent position for agricultural production would, therefore, have to be justified on both the managerial and the physical levels.

Before that exercise, however, it is crucial to ask why farms with their nature of decision-making unit and physical base have emerged as an organisation. Institutional economists

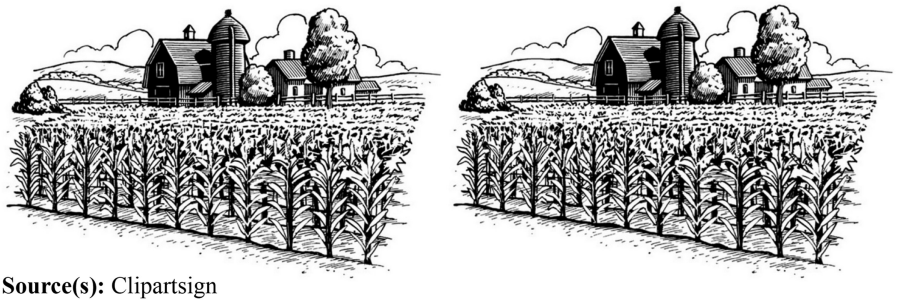

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Figure 1.
One farm or two farms?

repeatedly emphasise that "firms exist because going to the market all the time can impose heavy transaction costs" (Van Leeuwen, 2010). It may seem obscure to cite this for the organisational entity of a farm which often is run by one person only. But this single person usually combines decision-making and physical production. And under today's conditions, the "heavy transaction costs" might be imposed if the person making production decisions had to negotiate with another person who is in charge of physical production in another company.

Part of this is due to the fact that agricultural production is tied to land and stables. As crops necessarily need land to grow on, the claim that they may not necessarily need farms may seem counterintuitive and will need a strong theoretical argument.

4. Managerial challenges to the farm

The claim that the room to manoeuvre for farm managers has already shrunk and continues to do so is not new. Much of this is documented in the literature on farmer autonomy, even though a major part of this literature makes suggestions on how to enlarge the autonomy of farmers (e.g. Schneider and Niederle, 2010). As farmers always suffer from power asymmetries with their counterparts in wholesaling and the industry (Verdenk, 2019), the sympathy of many scholars rests with what Van der Ploeg and Schneider (2022) call the "self-organising capacity" of farmers, so that there is a continuous desire to strengthen their position. However, such attempts have provoked Stock *et al.* (2014) to warn of both the over-romanticisation of cooperation across peasant movements and of the over-romanticisation of the individual entrepreneur in agro-industrial and family farming sectors.

It is true that traditionally, autonomy is an important argument to enter farming and that the loss of autonomy is often connected to a loss of well-being (Peel *et al.*, 2019). Nevertheless, there is a major consensus about the existing trade-offs between the autonomy of farmers and what Szumelda (2019) calls a "secure existence" and Key and McDonald (2006) "risk reduction". The literature of both contract farming and vertical integration in agriculture provides a thick description of this trade-off.

Whilst they choose different legal forms, both contract farming and vertical farming describe, in essence, a shift of decision-making authority from the farmer to the agribusiness company she contracts with. Usually, these contracts do not only specify amounts to be delivered and prices to be paid but also varieties or breeds (Wilson, 1986), feed and medicine (Gulati *et al.*, 2008) and, finally, the production methods (Bijman, 2008).

In addition to the consensus that this development delegates managerial decisions away from farm managers, there also seems to be a consensus that contract farming and vertical integration, no matter in which part of the world, increases farm income (Bamiro *et al.*, 2009; Barrett *et al.*, 2012; Narayanan, 2014; Otsuka *et al.*, 2016). This difference in profitability is important for two reasons: first, it is important because the invisible hand of the market tends to favour efficient solutions over inefficient ones. This means that the delegations of decisions from the farm to agribusiness companies has not only increased in the past but also is very likely to increase in the future. And it is important because it says something about the quality of decisions. The quality of decisions being made on the office floor of agribusiness enterprises on the choice of feed and the duration of fattening periods seems, on average, to excel the decisions being made within the farmhouses.

The most likely reason for this discrepancy is that the professionals within the major companies have been educated to make full use of the mounting data on production processes. They can organise themselves access to the literature and they can systematically evaluate the experiences of their suppliers. These are options that a farm manager rarely has.

What impact does it have if production decisions are increasingly carried out by actors outside the farm? Dubb (2018) answers this question by "proletarization", and it is difficult to

dissent to this diagnosis. A farmer that does not make decisions about her farm any more has become a worker rather than an entrepreneur.

The erosion of decision-making power within farms is not only restricted to primary production but also to itself. Some processes around agricultural production have been shifting from farms to specialised companies. Consider chicken breeding as a case in point. Over centuries, it went without saying that chicken breeding was done on the farms (Hamm, 1858). In the industrialised world, this has drastically changed. Now, there are a few very large companies and some small ones that are specialized in providing the young animals to farms (Bell *et al.*, 2002).

5. Geographical challenges to the farm

It has been shown above that the specific about a farm compared with just any company in the agricultural sector is its geographic centeredness. We often speak about a farming couple and sometimes also employees, who work on a specific piece of land and maybe in a stable at the same location. The institutionalisation of farms has been due to the fact that it was necessary to allocate human labour in physical proximity to the respective piece of fertile land.

Not only since the largest international tractor producer started to market its first autonomous tractor (Neil, 2022) but also the unity of labour and production is increasingly challenged. Well attended by an engaged public, we currently face a trend to production solutions in agriculture where human labour becomes increasingly negligible. What some scholars call Agriculture 4.0 (Kovacs and Husti, 2018; Panetto *et al.*, 2020), others smart farming (Virk *et al.*, 2020; Moysiadis *et al.*, 2021) and most the digitisation (Marinello *et al.*, 2019) or digitalisation (Lioutas *et al.*, 2021) of agriculture is the tendency to marginalise the human involvement on the field, the grassland or in the stable.

In most evaluations of this ongoing process, it is emphasised how labour costs can be cut through digital technologies (Paklinka and Revenko, 2019; Rotz *et al.*, 2019). It is also true that the digitisation of agriculture creates additional necessities for human involvement, particularly in the IT sector (Fernandez-Marcia, 2018). For our question, however, it is crucial to acknowledge that the digitisation makes human involvement on the spot much less necessary than it used to be. It is only a question of time until robots seed, plough, fertilise and harvest on our fields and until they feed or milk our animals. This does not only liberate people sitting on machines for hours but also it allows technologies to be used for much longer periods, not taking into account that labourers need rest.

The digitisation of agriculture reduces labour and shifts the remaining labour from production activities on the spot to the development of algorithms or the programming of machines for specific sites. These latter activities can be carried out anywhere. The autonomous tractor will soon be able to drive to a field in Eastern Australia and plough it whilst the necessary human work for it can be done in Austin, Texas. Few scholars have thought this as radically through as Asseng and Asche (2019) who predict "farms without farmers" once robots have taken over.

This, however, makes the geographical unity of the farm obsolete. Today, every farm is linked to a certain geographical spot. The fields on which crop production takes place will continue, of course, to be firmly linked to this spot. The people responsible for this work, however, would not. This means that the farm as we know it today has will lose its rationale and therefore, will cease to play an important role.

6. Alternatives to the farm as we know it

The previous section has shown that a "proletarization" of the farmer as envisaged by Dubb (2018) is unlikely. How could a digitalized production system make use of human masses for

production purposes if most or all activities are carried out by machines? Taken together, what we have come to know as a farm is likely to lose two constituting characteristics more or less simultaneously: one is the farm as a physical location for production decisions and the other is the farm as a physical location for human labour. If these two constituting elements are lost, it is probably not helpful any more to speak of a farm.

It has also been mentioned that the production of crops on fields is something that is not going to change soon. Another very stable factor is probably that every field and every stable is owned by some person (or sometimes an organisation). Today, the owner sometimes is the farm manager herself, in other cases (and increasingly) it is the farm manager's landlady. If we accept this as a given and stable fact, the core question is: what will the owner or tenant of the land do with it under the changed conditions. How does land stewardship work if neither the owner's or tenant's decisions or her physical presence are required anymore?

Nye (2020; p.223) has recently argued that "the increasing contribution of agricultural contractors [. . .] has been almost entirely ignored on the research agenda". The share of agricultural labour carried out by contractors in on the rise (Birner *et al.*, 2021), and farms that use them are usually more productive than others (Hoop *et al.*, 2013). When thinking about the future of agricultural production, it may be worthwhile to take a look into their business model.

Contractors do the ploughing, spraying, fertilising, harvesting and other activities on farmland where they are hired. Their main advantage is that they can afford modern large-scale machines, as they are able to use them on large pieces of land, whereas the purchase of agricultural technologies by single farms often leads to overmechanisation (Daskalopuolou and Petrou, 2002; Lips *et al.*, 2007). Therefore, they are able to undertake the physical production activities on the land without being responsible for the decisions related to it. Contractors usually provide manpower and machinery, but a shift from labour towards capital due to the process of digitalisation is unlikely to challenge their business model.

It has been shown that the two characteristics "production activities" and "managerial decisions" have been the two constituting characteristics of "a" farm. How do the centralisation of production decisions and the digitalisation of production impact this?

The short answer is that current developments decouple the two aspects. Production activities that require machinery only will often be taken over by specialised companies, occasionally also be realised by the manager of the land herself. Neither of these solutions requires physical presence of humans on the spot. Managerial decisions will often be taken by responsible managers in the value chain and sometimes by the persons responsible for the land management only. Again, their physical presence is not obligatory. It will, of course, be necessary to know the characteristics of soil and climate very well to make the decisions in a useful way. However, there is no obstacle in collecting the necessary local information in databases so that the knowledge of local conditions also not requires physical presence.

It is, therefore, likely that agricultural production in the future will largely be carried out by autonomous machines, steered through production decisions by actors in the industrial sector or by persons specialised in agricultural production. The physical location of these persons will be largely unimportant. There is no need for farms any more who host these actors and their machines.

7. Challenges for organisational behaviour research

It is, of course, possible to plainly envisage the upcoming transformation without taking steps to shape it. However, as reference was made to Woodward's (1958) contingency theory, it should always be considered that organizational structure should proactively be adapted to upcoming changes (Donaldson, 2001; Brunetto *et al.*, 2018). It is worthwhile to consider at least intellectual steps how to both prepare for and smoothen the likely developments. As the

changes will have their core in the organisational structures of agriculture, it is a rewarding objective of organisational behaviour research to make a substantial contribution to prepare and accompany transformation processes of agriculture.

This has not happened yet. Organisational behaviour research has occasionally focused on behavioural responses to different stimuli in family farms (Glover and Reay, 2015; Hadjielias *et al.*, 2021), and it has explored alternative organisational forms to family farms such as the Kibbutz (Dar and Getz, 2020) or agricultural cooperatives (Biswar, 2015). And whilst organisation behaviour scholars have voiced support for maintaining the role of family farms (Wiggins *et al.*, 2010), it is still easy to agree with Wilson (2018) who claims that agriculture to date may qualify as the most neglected sector in this scientific domain.

However, the envisaged transformative processes suggest that the simple organisational structures of the traditional family farm are the very reason that there is probably not a lot of future potential in this organisational form. To understand the contribution of organization behaviour research in the future transformative processes, it is worthwhile to explore how the vanishing necessity of making decisions and carrying out physical production can be accompanied fruitfully through the contributions that organisation behaviour scholars can make.

7.1 Managerial decisions

It has been described that the reason for the shift of managerial decisions away from farms is the scientific quality of these decisions. Whilst it may be obvious that large industrial enterprises are better equipped than single farming families to formulate production formulas that optimise yield and product quality, it is less obvious in which organisational setting the "best" decisions can be made.

If one links the vast literature on leadership and organisational behaviour (e.g. Miner, 2005; Busse, 2014; Ho, 2016; Wibowo and Paramita, 2022) to the also considerable body of literature about knowledge management (e.g. Larsen and Olaisen, 2013; Sharma *et al.*, 2021; Jevnaker and Olaisen, 2022), a lot of support is provided. The art to collect process and communicate production strategies, adapted for the different agricultural environments, will be decisive in the competition for formulas to be applied in future production processes. In an example from construction businesses that could be valuable for the industries in managing primary production, Huemer and Östergren (2000) describe pathways towards what they call an inter-domestic strategy. Only linking biological and technological insights about promising strategies with detailed information on geographical particularities will lead to competitive advantages in the market.

In particular, the emphasis of sharing knowledge (Wang and Noe, 2010) and organisational learning (De Jesus Ginja Antunes and Goncalves Pinheiro, 2020) is something where added value can be drawn in the competition for the best definition of production processes. Optimised agricultural production processes require knowledge from diverse fields like soil science, crop nutrition and pest management. Organisational behaviour scholars know that such knowledge grows bottom up and that managers need to create the organisational capacity to use it cohesively. It is, therefore, the contribution of organisational behaviour research to identify the best "decision design" (Poelmans and Sahibzada, 2004) to make the existing knowledge, be it local or scientific, available for the definition of appropriate agricultural production processes.

7.2 Production activities

It is likely that enterprises in the food industry will be the actors who will define the production parameters for the commodities they process including races and breedings to be used, the amount of inputs to be used and the point for delivery. Other questions (that

yet always are decided by farm managers) will be further away from the final product, need to be decided short-term and based on other expert-knowledge: is no-tillage applied? With which speed will the harvester drive over the field? Will catch crops be grown after harvest?

Whilst it is unlikely that farmers as we know them will be best suited for making these short-term, technical decisions, it is yet to be found out which is the organisational setting that should not only make these decision but also realise them by sending machines to the field. It has been mentioned above that farming contractors would be potential actors in this field. However, other options include the producers of agricultural technology that could consider the application of their machines as an attractive extension of their business model or cooperatives, perhaps of former farming families that want to take over production processes.

The angle from which organisational behaviour research can contribute to this question is the thorough understanding of social systems (Harder and Tokarski, 2017). A recent contribution by Tortia and Sachhetti (2022) explores the questions that have to be answered in order to find suitable organisational forms for the actors in the production processes itself: who are the internal stakeholders and what are their interests? How can the governance rule be adapted to both needs and goals? This way, the identification of the most suitable forms for carrying out agricultural production can work more smoothly.

7.3 Summary

Agricultural production will, of course, continue. But as this will increasingly happen without the institutional frame of a farm, so that organisational scientists will have to assist in identifying more suitable social systems for the future. Whoever will take the production decisions, the organization theory should contribute to improve the design of the choice of crops, technologies to be applied and the use of inputs and finally, with an increasing decoupling of ownership and management, the ways should be found that the individuals in charge can identify with what they do.

8. Conclusions

The farmland owner of the future will have the possibility to work her land with own machinery, but will be more likely to delegate the physical processes on her land to contractors. The owner also will have the possibility to decide herself what to grow and how to cultivate it. In very many cases, however, she will prefer to delegate these decisions, be it to her industrial partners, to contractors or to companies specialising in agricultural management. Neither of the actors mentioned here would have the necessity to organise themselves in farms.

This does not mean that farms will stop to exist any time soon. Some people may, and probably also will, organise themselves at a place where they practice agriculture, live and work there as they have for centuries and be it only for the reason to preserve traditions. However, this is not a model with which the rent from farmland is likely to be maximised. It is, therefore, unlikely that the farm will be the dominant organisational setting for the agricultural production over the coming centuries. The more resources are available to push the digitalisation of agriculture and the development of vertical integration, the quicker this will change. Therefore, the position of the farm in the Global North will be challenged at an earlier period of time than in the Global South.

If it is not entirely mistaken, this claim raises, of course, questions for similar businesses: if farms, as we know them, cease to exist, what about other businesses that are constituted through the geographical jointness of production and decision-making, such as craft enterprises or small quarries? It is crucial to acknowledge the difference between the sectors in cultural and organisational regards. However, we should nevertheless examine if the

decoupling between production processes and decision-making on the same geographical spot only affects the future of food production or much more of our professional life.

It is clear that future work will be needed to answer these questions with sufficient evidence. And it is also clear that a lot of political and academic work will be needed to find socially sustainable pathways for the billions of peasants dependent on their farm today. And even more research is needed to govern the upcoming transformation of agricultural production in a sustainable way, particularly in the realm of organisational behaviour research.

All this indicates that one thing is certain for the future of organisational behaviour research: the entire agricultural sector that has never been in the focus of the organisational behaviour research will increasingly provide an important and promising empirical field for scholars in this discipline.

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