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Social dimensions of multifunctional agriculture in Europe - towards an interdisciplinary framework

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ABSTRACT



Agriculture is embedded in and interacts with both its ecological and social environments. Under the concept of 'Multifunctional Agriculture', these interactions receive attention from scientific and political communities in terms of societal functions that can be fulfilled by farms. The discourse has focused on ecological functions, while agriculture's social contributions are frequently mentioned but not systematically addressed. Accordingly, respective empirical results remain fragmented and applied conceptual approaches barely integrated. To address this research gap, we conducted a systematic literature review on the social functions of European agriculture. Our analysis (a) disentangles different definitions and categorizations of social functions found in the literature; (b) proposes an interdisciplinary framework and categorization that eases the linkage of relevant insights from different conceptual viewpoints; and (c) paves the way for the differentiated recognition and governance of the diverse social functions potentially delivered by farms and their activities in the European context.

1. Introduction

The role of farms and their multiple activities in European rural territories is contested (Knickel et al., 2017; van Acker, 2008). Although the effects of agricultural production on ecosystems are now widely acknowledged, agricultural policies do not yet sufficiently target these effects and adequate governance mechanisms need further refinement (Dik et al., 2021; Pe'er et al., 2019). At the same time, diverse social and cultural benefits are attributed to agriculture and problematized in the context of changing farm size structures (Committee on Agriculture and Rural Development, 2014; Matthews, 2019, 2015; Nowack et al., 2019). In contrast to the discourse on the ecological effects of agriculture, claims about the social effects of agriculture often remain general and vague. For instance, the contribution of agriculture to 'rural vitality' is highlighted without making explicit what is actually meant, while other arguments focus

solely on the sector's contribution to rural employment. Against this background and given that (1) the agricultural sector's socioeconomic importance in terms of employment continues to decline and (2) the field of activities that farms are involved in has broadened significantly (Augère-Granier, 2016; Cook, 2019), we find it important to systematically reconsider potential contributions of farms and their activities¹ to sustainable rural development in social terms. Accordingly, this article reviews different literature strands' insights on European agriculture's social contributions, merging these in a systematic categorization and an interdisciplinary framework based on the notion of Multifunctional Agriculture (MFA).

MFA is chosen as a starting point as it is closely related to sustainability discourses: As MFA allows for a holistic view of farms' diverse roles in society, it has become an overarching frame of reference for depicting the multiple interactions between

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agriculture and its socio-ecological environment across disciplines (Renting et al., 2009; Wilson, 2007; Zasada, 2011). Much influenced by terminology originating in agricultural economics, such as ‘externalities’ and ‘public goods’, the MFA discourse mainly concerns non-commodity outputs related to agricultural production processes and is closely linked with questions of adequate governance mechanisms (Blom-Zandstra et al., 2016). Thus, MFA is not only extensively researched, but it has also entered political debates (Zasada, 2011) and allowed for new kinds of conclusions to be drawn regarding agricultural and rural policies (Josling, 2015).

OECD (2001), Abler (2001), and Cooper et al. (2009) all categorize agricultural functions for OECD countries and the European Union’s member states. They exemplarily show the operationalization of MFA by agricultural economists and the range of functions usually paid attention to (see table 1). In these authors’ categorizations as well as in the whole discourse on MFA, one can observe a bias towards agriculture’s interrelations with its ecological environment (hereafter, ‘ecological functions’). ‘Social functions’ of agriculture, in contrast, have generally received little attention and are hardly conceptualized as such.² Or, put differently, research on this aspect is missing from the mainstream literature on MFA, with existing categorizations being rather blurry and inconsistent compared to those covering ecological functions.

To address this research gap, our systematic literature review (a) disentangles different definitions and categorizations of social functions found in the literature; (b) proposes an interdisciplinary framework and categorization that eases the linkage of relevant insights from different conceptual viewpoints; and

(c) paves the way for a differentiated recognition and governance of the diverse social functions potentially delivered by farms and their activities in the European context.

2. Methodological procedure

The key objective in the literature search was to capture a large and multidisciplinary variety of publications dealing with the social functions of agriculture. Initially, we define these as effects that are generated through farming and farm-related activities, unfolding in the social sphere of the territory farms are located in and are conceived as being socially valuable.

In order to avoid a literature selection biased towards contributions known by the authors beforehand and in order to achieve a high level of transparency, a ‘systematic’ approach was chosen (Gough et al., 2012, p. 6). The resulting review can be further characterized as ‘configurative’, ‘qualitative’, and, to some extent, also ‘meta-narrative’ (Gough et al., 2012). In other words, our review relates different pieces of literature rather than adding up findings, it recapitulates and compares meanings of generated insights rather than comparing numerical results and, to a limited extent, takes into account and carves out different underlying meta-level perspectives.

In an iterative process, a list of keywords and synonyms was created in order to cover a range of literature strands that were expected to address the issue concerned, although different terminology is used (see Table 2 and Figure 1). On this basis, a Boolean search was conducted via Scopus and, slightly

Table 1. Overview of functions in terms of non-commodity outputs or public goods respectively acknowledged in the three seminal publications of Abler (2001, p. 4), OECD (2001, p. 40), and Cooper et al. (2009; pp. 15–28).

Abler, 2001: ‘Non-commodity outputs’ / <i>negative externalities</i>	OECD, 2001: ‘Non-commodity effects’	Cooper et al., 2009: ‘Public goods’
Landscape and open space amenities	Landscape	Agricultural landscapes
Cultural heritage	Cultural heritage	-
Rural economic viability	Rural viability	Rural vitality
Enhanced food security	Food security	Food security
Prevention of natural hazards	Land conservation	Resilience to flooding Resilience to fire
Groundwater resource recharge	Water use	Water quality and water availability
<i>Water pollution from nutrients and erosion</i>	Water quality	
Enhancement of biodiversity	Species and ecosystem diversity	Farmland biodiversity
<i>Loss of Biodiversity</i>	Soil quality	Soil functionality
<i>Irrigation: Overuse, Salinization</i>	Air quality	Air quality
-	Greenhouse gases	Climate stability
<i>Greenhouse Gas Emissions</i>	Animal welfare	Farm animal Welfare and Animal Health
-		

Table 2. List of key words applied in a Booleans search in Scopus (June 13, 2019). Out of each column, one term needed to appear in the title, abstract, or keywords. The search was limited to articles, book chapters, and conference papers.

1	2	3
Agriculture	Multifunctional	Rural development
Farming	Social	Regional development
Farm	Cultural	Rural area
	Function	Rural community
	Public good	
	Common good	
	Externalities	
	Benefits	

adjusted, also Google Scholar.³ In addition to the keywords, which functioned as inclusion criteria in phase 1, several exclusion criteria were applied to maintain focus: Contributions that were published before 2000⁴ were excluded as well as publications focusing on non-European countries, forestry, or aquaculture (not considered as agriculture here). Format wise, only scientific journal articles, conferences papers, and book chapters were considered in order to keep the number of search results manageable and assuming that these three publication types cover an adequately broad spectrum. Those contributions meeting the inclusion criteria and *not* meeting the exclusion criteria were included in the primary body of literature ($n = 243$).

Next, abstracts (or introductions in case of book chapters) were read and all contributions not dealing with anything complying with our understanding of social functions and doing so in a European context were excluded (resulting in $n = 80$ in the secondary body). Contributions in the resulting secondary body

of literature were read completely and another 55 contributions were excluded. The main reasons for exclusions at this stage were a focus on environmental functions of agriculture, analysis of society's expectations rather than functions found to be fulfilled, and/or social functions mentioned to exist, but not further addressed. The tertiary literature body ($n = 25$; see supplement 1) was then thoroughly analysed using an inductive and iterative coding process supported by MAXQDA software. The coding helped to jointly analyse and compare different conceptualizations and definitions in the first step and then allowed for the development of 11 distinct social functions, which were clustered in four categories.

Our literature review does not allow for conclusions regarding the relevance of the identified social functions, the question whether these are fulfilled in a satisfying way, or the degree to which they are already reflected in existing policy objectives or governance mechanisms. Explorative thoughts on these aspects are discussed in section 5.

3. Review results

The following sections present our review results: First, an overview about the diversity of articles in terms of research foci and methodological approaches is given (3.1). Second, the respective authors' conceptual approaches to depict (social) functions of agriculture are described (3.2). Third, definitions and/or categorisations as applied in the literature body are presented (3.3).

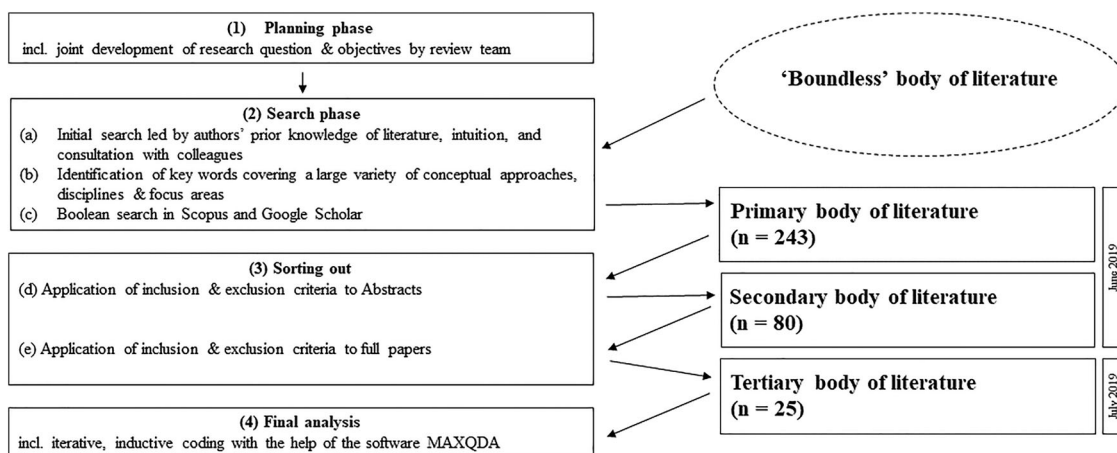


Figure 1. Visual overview of steps taken during the systematic selection of literature, which resulted in the compilation of the final (tertiary) body of literature subject to in-depth analysis (own representation).

3.1 Research approaches and geographical foci

The reviewed articles provide insights regarding social functions in the context of different research foci and methodological approaches. Knickel et al. (2004), Renting et al. (2008), and van Huylenbroeck et al. (2007), for instance, conduct literature reviews and deal with MFA in a rather conceptual way without referring to one specific region or type of farming. Pezzini (2001) and Belletti and Marescotti (2011) also do not refer to own empirical data and discuss agriculture's (changing) role in rural development in OECD countries and the contributions of food production that is promoted through geographical indications to rural development respectively.

Yet, almost half of the articles generate their insights from case studies (12 out of 25 articles). In total, 21 case study regions are analysed. Cases always are spatial entities, which are either defined by specific farming systems (e.g. bergamot production in Grecanic area in Italy, as in Mantino & Vanni, 2018) and/or physio geographical characteristics (e.g. the Serchio river basin studied by Rovai & Andreoli, 2016) or administrative boundaries (e.g. Östergötland in Granvik et al., 2012 or Hordaland in Refsgaard & Johnson, 2010). In the majority of the publications, qualitative data plays a central role for the analysis, whereby some authors combine qualitative and quantitative data. Refsgaard and Johnson (2010), for instance, collect qualitative data in the first step, then use generated insights for the development of a simulation model (called POMMARD) integrating social aspects of agriculture. The research foci of the case study based articles range from the analyses of specific kind of farming and farm-related activities or business models to the assessment of policies incentivizing the fulfilment of functions through agriculture.

Another eight contributions concern larger regions or whole countries without these being framed as 'case studies': Sicily in Foti et al. (2013), Wales in Hill and Bradley (2019), Portugal in Pinto-Correia and Breman (2009), the Czech Republic in Hudcová et al. (2018), Italy and Poland in Kummitha et al. (2018), Cyprus in Ragkos and Theodoridis (2016), the UK in Marsden and Sonnino (2008) and Norway in Bjørkhaug and Richards (2008). Here, literature reviews and document analysis are the dominant sources used for the generation of insights, whereby interviews or statistical data are referred to in a

complementary way. An exception is the study about Cyprus, which is based on a survey including choice experiments (Ragkos & Theodoridis, 2016).

Finally, and with regard to the geographical distribution of case study regions and countries studied, it is worth mentioning that all parts of Europe are represented, but a geographical bias towards southern Europe and Scandinavia can be observed. In eight publications, the reference regions are located in Italy and another four publications' geographical focus is Norway or Sweden.

3.2 Disciplinary origins and conceptual approaches

Similar to what was found in prior reviews dealing with MFA (Renting et al., 2009; Wilson, 2007), the disciplinary backgrounds of the authors range from agricultural and ecological economics to rural sociology and human geography. In the majority of the articles reviewed, independent of their main disciplinary perspective, (agricultural) economic concepts are at least mentioned in the introductory sections. These are mainly public goods, non-commodity outputs, and externalities – often with reference to the three aforementioned seminal publications (Abler, 2001; Cooper et al., 2009; OECD, 2001).

The purpose of all three concepts concerns the identification of results of agricultural production, which either are not allocated through the market (public goods and non-commodity outputs) or which are side-effects of production processes (externalities). The concept of public goods emphasises the fact that the respective results are considered valuable goods, but they cannot be traded on the market due to their characteristics of non-excludability and non-rivalry. Non-commodity outputs are less specific; the term points to the respective outputs not (yet) being commodified and does not imply a value judgement for the respective output. Thus, a non-commodity output can be beneficial or harmful. Positive and negative externalities designate effects of production processes that are neither intended nor taken into account by the producer. Several authors point to challenges regarding these concepts' application to social aspects, confirming our presumed lack of conceptualization of social functions of agriculture, e.g.:

The social public goods included were food security, rural vitality and farm animal welfare and health,

although such functions and services cannot be considered public goods in *sensu stricto* but rather societal aspirations that, if achieved, represent socially and politically outcomes (Mantino & Vanni, 2018, p. 2).

Another concept that is frequently referred to, but rarely explained, is social capital. Rooted in sociology and political science, social capital refers to the capacity of communities or groups of people to act collectively. Hill and Bradley (2019), who explicitly frame social functions of agriculture as agriculture's role in generating social capital, assume that social capital constitutes positive (social) externalities (Hill & Bradley, 2019, p. 6) and point at its beneficial role for the provision of public goods. The authors first explore different aspects of social capital highlighted in the literature (e.g. social networks, community cohesion, social capacity) and, second, based on their conceptual elaborations, study how agriculture in Wales has contributed to the generation of social capital.

Coming from a slightly different angle, the concept of ecosystem services is present in several of the analysed articles and partially used to depict agricultural functions affecting the social sphere at the territorial level (Gullino et al., 2018; Mantino & Vanni, 2018; Rovai & Andreoli, 2016). Unlike the previously mentioned concepts, ecosystem services depict benefits delivered through ecosystems, e.g. agro-ecosystems, thus only indirectly from farming and farm-related activities. For specific social functions, ecosystem services offer a suitable conceptual entry point as shown in Rovai and Andreoli (2016). The authors focus on the regulating services, like the ability increase flood resilience, that agro-ecosystems can deliver along with the role of farms in the management of such agro-ecosystems.

(Rural) sociologists like Knickel et al. (2004) and Renting et al. (2008), in the context of MFA, deal with different household strategies of farming households and refer to the concepts of pluriactivity and farm diversification to depict a household's multiple activities beyond farming activities. Using the terminology 'broadening, deepening and regrounding', they analyse how such activities can unfold with respect to the farms' role and embeddedness in the surrounding rural region or territory. Depending on the farm household's activities, different social functions are found to exist. Diversification, implying a wider range of goods and services offered, is considered a broadening strategy. Organic farming and direct marketing are considered to deepen

agriculture's integration in the regional economy, while new ways of resource mobilization on and off the farm (incl. off-farm employment) are understood as regrounding activities. In general, authors with the corresponding perspective conject a disintegration of agriculture as a result of rationalization processes, while they perceive broadening, deepening, and regrounding strategies as means of a 're-integration' of agriculture into rural territories:

Particularly important are the (potential) synergies between local and regional ecosystems, specific farm styles, specific goods and services, localised food chains and relevant social carriers and movements. Whilst the rationalisation of agricultural production has normally been linked with a segregation from other rural activities, in the new developments mutual benefits and 'win-win situations' between different activities appear both strategic and desirable (Knickel et al., 2004, p. 90; citing van der Ploeg & Saccomandi, 1995).

From their perspective, multifunctionality rather constitutes a development pathway, which farm households actively chose as an objective or a (desirable) characteristic of farms' activities.

Green care is one specific aspect of farm-based activities captured by the concept of social farming that is the subject of interest across a range of literature, as represented by the contributions of Foti et al. (2013) and Hudcová et al. (2018) in our review. The concept sheds light on effects resulting from farming and unfolding in the social sphere, which is barely acknowledged in other literature strands relating to MFA: positive effects not just on the health of vulnerable people like the elderly, the disabled, and the psychologically sick, but also the inclusion of marginalized people in rural communities.

Finally, and interlinked with sociological as well as agricultural economic research, human geographers analyse farms as central components of localized agri-food systems (LAFS) (Arfini et al., 2019; Mantino & Vanni, 2018) or of rural webs (Marsden, 2010). Both concepts start from a territorial (vs. sectoral) perspective of rural development, focusing on the interactions and synergies among different actors involved in agri-food systems as well as the role of particularities that are specific to a territory. In this strand of literature, (social) functions of agriculture are dealt with rather indirectly through the acknowledgement of the positive effects related to the presence of farms in a territory and their role as connecting points in socio-economic networks.⁵

Beyond these above concepts, several authors refer to the (contested) paradigm shifts from productivism to post-productivism and/or multifunctionality (e.g. Pinto-Correia & Breman, 2009). This links the issue of potential (social) functions of agriculture to changes regarding agriculture's prior dominant role in rural areas and the changing societal functions of rural territories as a whole (e.g. towards so-called 'consumption sides').

3.3 How are (social) functions defined and categorized?

Our assumption concerning a lack of conceptualization and differentiation of the social dimension of multifunctional agriculture is confirmed. The term 'social function', along with similar expressions like 'social contributions' or 'social benefits', appear in many of the articles, but are filled with different content. For instance, Arfini et al. (2019), distinguishing between 'environmental', 'socio-economic', and 'cultural' public goods (closely related to GI features), develop their own indicators for each of the groups of public goods. Van Huylbroeck (2007, p. 7) starts his review on MFA with a distinction of classes of agricultural functions and names them by different colours: 'Green', 'blue', 'yellow', and 'white functions'. 'Yellow functions' come closest to what we call social functions, but this is blurry due to a commingling of relatively abstract benefits (e.g. 'rural cohesion and vitality' or 'ambience and development') and specific services offered at the market (e.g. hunting, agrotourism, agro-entertainment'). Mantino and Vanni (2018), after elaborating on the concepts of public goods and ecosystem services, designate 'all the outcomes which benefit society' as 'environmental and social benefits' (p. 4) and create a straight-forward list of these based on prior work of different authors (see their appendix). In their study, 'social benefits' include 'outdoor recreation', 'health and social inclusion', and 'rural vitality' (Mantino & Vanni, 2018, p. 17).

Four of the contributions included in the analysed body of literature refer to a large-scale, European-wide, research project, MULTAGRI, for which a categorization and conceptualization of a large variety of functions of agriculture was worked out: According to Renting et al. (2008) and Knickel et al. (2004), farms respond to societal and consumer demands by engaging in various (new) farm-related activities and, through these, providing a variety of marketable

and non-marketable functions, which are then grouped in several categories with respective examples (Renting et al., 2008, p. 366):

- Food production, including distinctive quality attributes of food products (artisanal/traditional, regional/local, specific modes of production, etc.).
- Provisioning of goods and services for non-food markets (tourism, leisure, care, education, energy, primary materials for non-food processing, etc.).
- Environmental functions (biodiversity, landscape, water management, rural amenities, etc.).
- Cultural functions (identity, heritage, etc.).
- Social functions (food security, social cohesion, disperse settlement patterns, employment, etc.).
- Ethical functions (fair trade, animal welfare, etc.).

As the examples show, in these publications 'functions' refer to a broad spectrum of aspects of agriculture on different levels, ranging from different marketable goods and services (food vs. non-food) to aggregated and more abstract outcomes (e.g. 'identity', 'social cohesion', 'rural amenities'), relating to either the functioning of ecosystems or the social sphere (grouped under 'cultural functions', 'social functions', and 'ethical functions').

A related observation, extending to almost all of the analysed literature, is that MFA is partially, without actually explicitly defined as such, used as a synonym for farm diversification (as pointed out by Rovai & Andreoli, 2016). Following this interpretation, farms as individual entities become multifunctional as soon as they engage in activities other than food production. Against this background, the distinction between farming and farm-related activities as a form of action and their potential impact on the social sphere (social functions) turns out to be a crucial and fruitful step in our analysis: it allows for a clear distinction between different concepts' analytical foci.

Despite the apparent conceptual blurriness, the literature points to numerous kinds of social functions (Table 3). Some functions were easy to identify and differentiate since many authors explicitly name them and use similar terminology (e.g. provision of income and employment). Others required several rounds of re-coding and discussion among the authors regarding the functions' respective designation and delineation from each other. In order to handle the large variety of social functions identified, we arranged them according to the way they affect

Table 3. Range of social functions corresponding to our systematic review's results including minimal definitions and text examples from the analysed literature body.

No	Social functions	Minimal definition	Text example
Food provisioning function			
1	<i>Provision of regionally produced food</i>	Provision of food that is produced within the regional context and that fits people's dietary as well as cultural needs	'And, in spite of the surpluses on most agricultural markets, the internationalization of food chains and the fact that food security is not really an issue in Europe, local agriculture also contributes to more localised food supply systems considered important by many people, both urban and rural.' (Knickel et al., 2004, p. 82)
Socio-economic functions			
2	<i>Provision of income and employment</i>	Generation of income and employment opportunities on and off the farm	'Whereas in the coastal municipalities the service sector is predominant, agriculture [...] and the diverse activities associated to it [...] are a major source of employment and wealth, playing a vital role in local development.' (Mantino & Vanni, 2018, p. 11)
3	<i>Triggering of cooperation</i>	Role as hubs of socio-economic networks, supporting cooperation, synergies, and spill-over effects among rural enterprises	'By including farming as a component in the mix of activities in rural areas, it is possible to provide opportunities for other entrepreneurs to engage in, for example, tourism, the production of local brands, and farm shops, based on values associated with farming.' (Granvik et al., 2012, p. 163)
Socio-ecological functions			
4	<i>Safeguarding of residential area</i>	Maintenance of infrastructure, constituting a basis of rural settlement and preventing natural disasters, including flooding and fire	'Moreover, also functions that cannot be directly associated with goods, services or product attributes, but rather represent public benefits provided by agriculture, are considered relevant (e.g. rural viability, quality of life, food security, dispersed settlement patterns, etc.).' (Renting et al., 2008, p. 365)
5	<i>Shaping of space for recreation</i>	Contribution to an accessible territory with recreational value and touristic offers	'The typical landscape of Grecanic area is strongly dependent on the permanence of bergamot cultivation, which is highly appreciated by local and foreigner tourists.' (Mantino & Vanni, 2018, p. 11)
6	<i>Strengthening of territorial identity</i>	Contribution to people's sense of belonging and identity with regards to a specific (socially constructed) territory	'According to the stakeholders interviewed, the valorization of local identity is the main factor involved in the provision of rural vitality, which is ensured not only by the presence of several associations, organizations and consortia but also by traditional agri-food products and associated farming practices, which play a key role in embodying, maintaining and sustaining the "sense of place". (Mantino & Vanni, 2018, p. 10)
7	<i>Facilitation of human-nature interaction</i>	Provision of direct or indirect occasions and moments of positive human-nature interaction including resulting beneficial health effects	'According to their words, the contribution of social farms to rural development lies in the protection of nature, the preservation of diversity, the preservation of the human-nature relationship.' (Hudcová et al., 2018, p. 393)
Socio-cultural functions			
8	<i>Preservation of cultural heritage</i>	Preservation of cultural heritage (material and non-material)	'Territorially based development that redefines nature by re-emphasizing food production and agro-ecology and that reasserts the socio-environmental role of agriculture as a major agent in sustaining rural economies and cultures.' (Marsden, 2010, p. 228)
9	<i>Strengthening of community cohesion</i>	Provision of occasions and opportunities of positive social interaction, solidarity, and inclusion of marginalized people	'We were also told that farm households (farmers or their wives) are typically central to village organizations (both secular and religious) and social activities.' (Hill & Bradley, 2019, p. 9)

(Continued)

Table 3. Continued.

No	Social functions	Minimal definition	Text example
10	<i>Facilitation of rural-urban-interaction</i>	Provision of occasions and opportunities for exchange between rural and urban inhabitants	'Selected social farms are mainly located [...] within the province of Catania with a strong concentration near urban centres, to really demonstrate the important role played by such structures to create a "renewed" relationship between the urban and rural world [...]' (Foti et al., 2013, p. 267)
11	<i>Enhancement of knowledge on agriculture</i>	Contribution to public as well as sectoral knowledge about food production	'Local farms offer knowledge on where the food comes from.' (Björklund & Milestad, 2006, p. 215)

the social sphere in terms of their specific impact level. What all have in common is that they can be relevant for the state of the social sphere and are considered means to achieve distinct possible societal objectives. The applied categorization touches upon classifications of those authors, who differentiate between 'economic' and/or 'social' and 'cultural' functions and distinguishes functions relating to

- peoples' opportunities to earn a reasonable income and meet their needs (socio-economic functions)
- people's relationship with their physical surrounding and 'sense of place' (socio-ecological functions)
- people's access to formats of positive social interaction, participation and learning (socio-cultural functions)

Furthermore, we added 'food provisioning functions' (see table 3) as a fourth category in order to do justice to the complexity and cross-cutting nature of the function we designated as *provision of regionally produced food*. The designation 'contribution to food security', as used, for instance, by Abler (2001) would have been an alternative. For two reasons, we decided to use *provision of regionally produced food* instead: First, a large part of the text passages clustered under this notion puts emphasis on local, socially and culturally 'embedded', food production (Marsden, 2010; Pinto-Correia & Breman, 2009) and the value of local value chains (Arfini et al., 2019). Thus, we want to emphasise the regional aspect. Second, we define social functions as positively conceived effects that unfold in the social sphere of the territory where the respective farms are located. Therefore, if a farm would only produce for the world market, its contribution to food security would not unfold in the social sphere of the territory it

operates in and, thus, is not considered as a social function here. Yet, if one would zoom out and deal with social functions from a global perspective, 'contribution to food security' would certainly be an important one.

Apart from that, *provision of regionally produced food*, much like *provision of income and employment*, belongs to the social functions already recognized and designated by many authors, independently from their conceptual viewpoint. Both almost necessarily result from activities carried out on farms since any farm, by (our) definition, produces food and, thus, at least one commodity, which is sold, usually generating income.

Triggering of cooperation also is considered a socio-economic function. This refers to numerous authors' insights (Donkers, 2008; Hudcová et al., 2018; Humer-Gruber, 2018; Knickel et al., 2004) regarding farms as a kind of node within socio-economic networks due to a multitude of economic partners and cooperation with different kinds of actors (e.g. food processing companies, restaurants, touristic agencies, and/or cultural associations). Particularly in the context of LAFs (Arfini et al., 2019; Mantino & Vanni, 2018) and rural webs (Marsden, 2010), what we designate as *triggering of cooperation* is of key importance and subject of analysis. For instance, Marsden (2010, p. 229) highlights:

In this sense, agri-food is not just to be seen as a basis for producing food commodities, *sensu stricto*, in the traditional sense. Rather, they hold far greater relational capacity in web development by stimulating both an infrastructural and an interactional basis for the development of a whole range of multifunctional goods and services, including agritourism, multiproduct development and ecological management.

The designations used to highlight this function in the analysed literature vary widely. To give a few examples: Arfini et al. (2019) take into account

'socio-economic spill over effects' as a public good in their analysis of the impact of geographical indications, Gullino et al. (2018) include 'rural farm networking' as a criteria for social sustainability, and Granvik et al. (2012, p. 163) point to 'synergies' that occur if rural entrepreneurs can build on agricultural resources and associated values. Beyond that, it is emphasised in different contexts that farmers tend to be especially well connected among each other, thus supporting the collective management of resources (Hill & Bradley, 2019).

Coming to socio-ecological functions, *safeguarding of residential area* and *shaping of space for recreation* are both functions directly relating to farm activities' role in managing and shaping landscapes. With regards to *safeguarding of residential area*, farms are found to play an important role in maintaining a safe territory for residential purposes by preventing floods and/or fire (analysed, for instance, in Rovai & Andreoli, 2016). Further, it is pointed out that farms allow for 'de-centralised settlement' (Humer-Gruber, 2018, p. 29), increasing the residential attractiveness of rural areas (Granvik et al., 2012; Pinto-Correia & Breman, 2009). Beyond that, farms are found to play a key role regarding the preservation and creation of space for recreational purposes, which is noted as valuable for both residents and tourists. This includes the visual appearance of (cultural) landscapes that are predominantly maintained through farming (or farm-related) activities (e.g. pointed out in Granvik et al., 2012 and Belletti & Marescotti, 2011) as well as their accessibility through agricultural roads, but also results from the offer of accommodation and recreational activities. For example, Mantino and Vanni (2018, appendix 1) define the 'social benefit' of 'outdoor recreation' as 'achieving (or maintaining) a good level of public access to the countryside to ensure public outdoor recreation and enjoyment.' Another socio-ecological function is *strengthening of territorial identity*. Like *strengthening of community cohesion* (below), a certain territorial identity is assumed to be an important element of well-functioning (rural) communities. This function refers to agriculture's role in supporting a territory specific 'sense of belonging' (Hill & Bradley, 2019; Mantino & Vanni, 2018). Through a combination of territory specific landscapes, shaped by agricultural practices and production, the presence of territory specific food products or festivities and customs rooted in the territory specific (historical) agricultural system, not only is cultural heritage preserved (see below), but

territorial identity is also found to be strengthened (Donkers, 2008; Ragkos & Theodoridis, 2016).

Facilitation of human-nature interaction is found to be a socio-ecological function relatively closely related to specific farm-related activities. It concerns farms' role as facilitators of situations in which people can develop a direct relationship to their natural environment: Through the consumption of food 'that is [not only] produced/procured/consumed locally, but also embedded in the locale (grounded in locally available resources, knowledge, skills, traditions, identity, sense of place, etc.)' (Marsden, 2010, p. 231) or through the active involvement in the production of food. Especially in the context social farming, the latter aspect implies significant health benefits for vulnerable people. These are not only referred to in Foti et al. (2013) and Hudcová et al. (2018), who specifically deal with social farming, but also in Mantino and Vanni (2018) and van Huylbroeck et al. (2007, p. 19) with reference to Di Iacovo (2003):

There are further indications that agriculture can have a significant contribution in the health sector as contact with nature and farming is shown to have a positive effect for disabled persons or people with mental or psychological problems.

A social function, which is also relatively close to the authors' differentiations and designations in the analysed literature, belongs to the category of socio-cultural functions: the *preservation of cultural heritage*. On this matter, farms can play different roles, which is due to the various forms that 'cultural heritage' can take, ranging from a landscape's appearance, the presence of specific types of buildings, and cultural practices. Cultural heritage can, for instance, be preserved through specific activities carried out with the purpose of cultural heritage preservation, which farms may even be remunerated for by the state or cultural associations (e.g. found in Knickel et al., 2004 and Humer-Gruber, 2018). Alternatively, farms have been continuing their farm business based on farming practices that are part of a specific culture (Mantino & Vanni, 2018; Pinto-Correia & Breman, 2009) or, for instance, preserve certain landscape elements or buildings that are perceived as cultural heritage (Ragkos & Theodoridis, 2016).

Another element found in the majority of the articles were the positive contributions to social cohesion, which we grouped under *strengthening of community cohesion*. This socio-cultural function is

supposed to depict the proactive role of the farming community within rural communities. It is found that farmers often actively engage in their villages (Hill & Bradley, 2019), not just employing or otherwise integrating marginalized people (Foti et al., 2013; Hudcová et al., 2018) but also sharing their machinery and other farm resources with neighbours (Renting et al., 2008). Since the term ‘cohesion’ is frequently mentioned in this context, with the primary and common social function resulting from respective activities seeming to concern the functioning of communities in terms of inclusion, solidarity, and positive interaction, the term chosen was *strengthening of community cohesion*.

Finally, there are two more socio-cultural functions that are found, firstly, to result from specific farm-related activities, implying points of contact between the farming community and visitors (e.g. selling of touristic offers, local marketing, and/or care work): *Facilitation of rural-urban-interaction and enhancement of knowledge on agriculture*. Foti et al. (2013, p. 267), for instance, mention the creation of ‘a “renewed” relationship between the urban and rural world’ and Renting et al. (2008, p. 371) state that pluriactive farms can ‘stimulate new producer-consumer networks, improve mutual understanding and appreciation of lifestyles, and thereby strengthen the capacity of farm households to actively respond to changing societal demands.’ *Enhancement of knowledge on agriculture* results from numerous processes and activities carried out on farms. In particular, guided tours of farms or other explicitly educational programmes are found to play an important role (Granvik et al., 2012) and are one important way in which farms’ activities can be assumed to contribute to public knowledge on agriculture, the origin of food, and related aspects. Yet, any visit or stay at a farm involves some form of knowledge sharing between the farm’s residents and their guests (Kummitha et al., 2018). Last, but not least, knowledge is also shared within the farming community, which leads to the overall beneficial outcome that knowledge is spread and improved (Belletti & Marescotti, 2011; Bjørkhaug & Richards, 2008).

The 11 distinct social functions we identified through our systematic review hint at the complexity and richness of agriculture’s role in rural development. Finally, we do not want to neglect the following insight supported by numerous statements in the literature: The fulfilment of social functions through agriculture can also be the precondition of specific

activities to be carried out by farms, which may, in turn, increase the farms’ income, thus increasing the range of functions fulfilled due to the broader range of activities and/or realized synergies:

... the conservation of a peculiar landscape (of which bergamot is a fundamental component, with evergreen trees and its typical hedges, rows and dry-stone walls) ... , creates new opportunities for the development of tourism facilities (agri-tourism farms, rural tourism, specialized services for nature hiking, etc.). (Mantino & Vanni, 2018, p. 15)

4. Towards an interdisciplinary framework depicting social functions of agriculture

Building upon our insights generated throughout the review process, we propose the following interdisciplinary framework (Figure 2) for a coherent and differentiated consideration of agriculture’s social functions. Our framework covers three interrelated levels: farm level, activity level, and function level. Reading it from the left, there are farms, which are understood as spatially anchored organizational units that, among others, produce food and constitute one of many actor groups relevant for rural development (farm level). The middle activity level covers farming and farm-related activities, carried out with the purpose of food and biomass production or in its direct context based on a farm’s resources. Most of the activities grouped here involve the production of marketable goods or services and, thus, generate income. Yet, informal and voluntary activities, like helping out neighbours or commitments to the village, are also included. Third, there is the level of functions, which can be fulfilled through the activities. Hence, functions are not equal to the products and services provided through those activities, rather these constitute aggregated and meta-level benefits resulting from the respective products’ and services’ existence. Following upon our argument made above and in conjunction with Figure 2: Social functions of agriculture are positive contributions to a situation conceived as desirable by society or, put differently, to a social objective being reached. Two examples: (1) A farm may produce different types of crops. One social function that can be assumed to be fulfilled in this case is not ‘food’, but *provision of regionally produced food* (see prior categorization) since the latter is a situation considered desirable by society, while ‘food’ as such is not more or less than a marketable good. (2) A farm may be engaged in

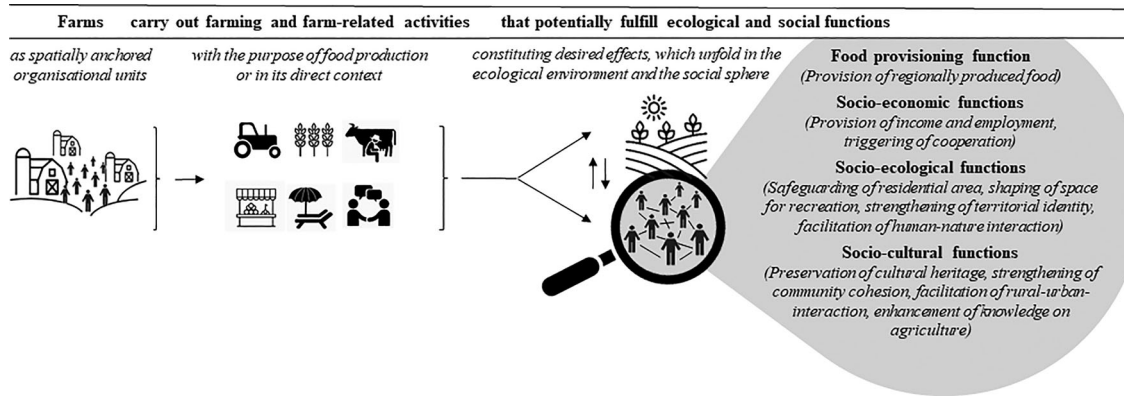


Figure 2. Interdisciplinary framework for a differentiated consideration of social functions, which are potentially fulfilled through agriculture in terms of farming and farm-related activities carried out by farms. Included icons are supposed to support an intuitive understanding and are not meant to represent all relevant aspects of the respective level (own representation).

farm-related activities and sell farm holidays. One social function likely to be fulfilled here is, for instance, the *shaping of space for recreation*.

The distinction between these three interrelated levels may seem somewhat artificial at the first glance. Yet, it is of high value if one aims to understand and account for the differences between analytical foci and disciplinary viewpoints. Farm diversification, for instance, concerns the activity level as well as green care, as it relates to a specific bundle of activities. Positive externalities or non-commodity outputs rather match the function level. Public goods could be arranged on the level of the societally desired situation that (social) functions contribute to. Social capital matches our conceptualization of (social) functions well, as it is understood as the capacity of social structures to achieve desired outcomes, for instance to manage or deliver public goods. Put differently, social capital depicts functions in terms of the means to an end. Rural webs and LAFs are concepts that allow for the generation of insights regarding all three levels of the framework, thus constituting a valuable analytical perspective within the context of the analysis of (social) functions. Yet, neither of the two concepts' unit of analysis matches one specific level of our framework. This is similar for ecosystems services, which is an appropriate concept to analytically depict specific social functions (i.e. cultural ecosystem services provided by agro-ecosystems).

A second key contribution of the presented framework is the differentiation between 11 types of inter-related social functions that are grouped in four

aggregate categories (see 3.3). If the fulfilment of these functions by the agricultural sector corresponds to political objectives, it may be helpful to account for respective interdependencies between the provision of these functions when designing political framework conditions and governance mechanisms. Apart from that, each of the four categories may also provide a well-suited starting point for empirical investigations, as addressing all 11 social functions simultaneously would require a relatively great variety of methods and data.

In our framework, we categorized social functions according to their specific scope of impact (food provisioning, socio-economic, socio-ecological, and socio-cultural). Another option is to consider their respective societal outreach: While all social functions are understood as means to achieve distinct societally desired situations, some can be assumed to benefit people within the territory where respective farms are located and others to create a supra-territorial impact. For the first group, one could count *provision of regionally produced food*, *provision of income and employment*, *triggering of cooperation*, *safeguarding of residential area*, *strengthening of territorial identity*, and *strengthening of community cohesion*. All have in common that social objectives are concerned, which are most relevant to the population in a farm's direct spatial surrounding. The second group would cover those social functions that may have a supra-territorial impact, thus unfolding beyond the farms' direct spatial surrounding: *Facilitation of human-nature interaction*, *shaping of space for recreation*, *enhancement of knowledge on agriculture*, *facilitation*

of rural-urban-interaction, and preservation of cultural heritage. To formulate it differently, the respective socially desired situations have an 'existence-value'; cultural heritage, for instance, may be valued by members of society, who never enjoy it 'in presence' but appreciate its existence. Yet, this categorization approach has its weaknesses as, for instance, well-functioning social structures on the regional level are also certainly in the interest of a society as a whole, which makes the distinction blurry. The approach could still be helpful if one aims to find out which governance mechanisms may rather be designed and implemented at the national level and which are better situated at lower spatial levels, like federal states, provinces, or municipalities. Depending on the respective functions' outreach, priorities as well as governance mechanisms may need to be adjusted to local circumstances. Further, this categorization may provide orientation for empirical studies on social functions – depending on the research question and interest.

5. Discussion and concluding remarks

Our review sheds light on the complexity of disentangling different conceptual approaches to, analytical viewpoints on, and contents of the social dimension of agriculture. The proposed framework eases the differentiation, as well as the linkage of, diverging analytical foci. The elaboration of four categories covering 11 distinct social functions provides orientation within the range of social contributions that can potentially be made by farms and their activities. In this manner, we uncover the complexity and richness that typically remains hidden behind vague terms like agriculture's contributions to 'rural vitality'. We are convinced that our categorization provides a starting point for a more precise designation of the public benefits that can unfold in the social sphere as a result of farms' activities. Our contribution also offers valuable insights concerning on-going debates on sustainable agricultural and rural development. In particular, it may contribute to balancing an overly one-sided discourse on agriculture in terms of production systems that need to be re-organized just to better serve ecological objectives. So far, there is no common understanding of what social sustainability in an agricultural context means. In the debate on pathways towards sustainable agriculture, for example under the notions of sustainable intensification and agroecological intensification,

there are few specific statements regarding how (far) the social embedding of farms should be taken into account in the search for, and design of, environmentally sustainable production methods (Lyu et al., 2021; Mockshell & Kamanda, 2018). The focus of existing sustainability assessment tools with regard to the social dimension is usually on on-farm working conditions, while the impact of a farm on rural communities or society in general is rarely considered. (Janker et al., 2019). At the same time, there is broad agreement that in particular the formation and safeguarding of social capital can be important for the implementation and maintenance of ecologically sustainable production systems (Pretty et al., 2020). The extent to which the inherent social impacts of agriculture itself, even independent of ecological goals, are valued by society and, thus, can be understood as *social functions*, is a normative and a socio-political issue. We conclude by raising three questions that we consider relevant when using our suggested categorization as a starting point for the further development of agricultural and rural policies.

Which social objectives are deemed relevant in a given rural territory?

Social objectives that agriculture can potentially contribute to, depend on societal norms, values, and preferences, which are always specific to time and place. These may differ across European countries and even within one country priorities may vary significantly. While the maintenance of traditional farm buildings, for instance, may be highly appreciated and constitute a social function (i.e. 'preservation of cultural heritage') in one rural territory, the population of another rural territory may not value these same traditional farm buildings. Thus, when elaborating about what social functions farms fulfil or are supposed to fulfil in a specific territory, an important initial step is the assessment of contemporary social objectives in that territory. A social function of agriculture can only be designated as such if it contributes to a situation or development conceived as desirable. The 11 distinct social functions that we present are deduced from what has been presented as desirable effects related to agricultural activities by the authors of the analysed literature across diverse geographical contexts. They do *not* necessarily reflect the social objectives existing and formulated at the regional, national, or EU levels.

Which other actor groups may fulfil relevant social functions besides farms?

If a social function corresponds to societal objectives, this implies that farms can, potentially, contribute to the respective objectives being achieved. However, this does *not* imply that farms are the only or most adequate actor group that should be addressed by any governance mechanisms. Depending on the social function supposed to be fulfilled and the types of farms present in the region of concern, there may be other actors, e.g. churches, schools, or welfare organizations, that are better positioned to fulfil these respective social functions. In order to assess which actor or combination of actors may be best suited to contribute to fulfilling social functions, questions of efficiency (how can a specific function be provided at the lowest cost?), quality (which actor could fulfil a social function best?), and potential overlaps with other policy objectives (e.g. income distribution) must be considered. If, for instance, one societal objective is to increase a specific region's attractiveness for tourists and another is to slow down the rate of farm exits in that region by encouraging income diversification, farms may be targeted by incentives to rent out rooms to tourists and to offer guided tours of their farms, while other actors, such as tourist agencies, gastronomy, and/or suppliers of outdoor sports, might have been able to increase the region's tourist numbers with lower investment costs and without farm involvement.

If farms are supposed to fulfil certain social functions, which governance mechanisms are appropriate?

Finally, the question arises whether, and, if so, which kind, policies and governance mechanisms are needed in order to have farms fulfilling specific social functions. Regarding some of the social functions we have dealt with, e.g. *shaping space for recreation or enhancement of knowledge on agriculture*, it may be straightforward to identify activities that are likely to fulfil them. For example, one can think of policy instruments that make it financially attractive for farms to engage in such activities. Regarding other social functions, e.g. *triggering of cooperation or strengthening of community cohesion*, the causalities of their fulfilment are much more complex. It may even be the case that such functions may not be fulfillable at the farm-level, thus requiring other governance mechanisms.

Considering the current distribution of the EU's public budget spent on agriculture, there is ample scope for more targeted spending on both the ecological and social functions of agriculture. Currently, the largest share of the agricultural budget is allocated to area-based subsidies (so-called direct payments), which are proclaimed as justified in that these support farmers' incomes, assuring the production of high-quality food within Europe as well as generally compensating for diverse public benefits associated with agriculture. This is in striking contrast with the unspecific nature as well as the distributional effects of these payments (Grethe et al., 2018).

Against this background, our conceptualization of the social functions of agriculture provides a basis for future research as well as for societal negotiations over the role(s) that farms may play for sustainable (rural) development and over the distribution of public funding to support farms in fulfilling respective functions. It may also support a more structured debate over the potential implications of declining farm numbers for the social functions of agriculture and over the societal repositioning of the agricultural sector within the EU.

Notes

1. Informed by Eurostat's definition of other 'gainful activities of the farm' (see eurostat (2020), on the one hand, and empirical observations on the other, we understand/define 'agriculture' to not only cover activities carried out for the purpose of food and biomass production (here 'farming activities'), but also so-called 'farm-related activities'. The latter refer to all activities that are carried out based on farm-specific physical and human resources.
2. We are aware of the contested differentiation between what is 'social' and 'ecological'. We also acknowledge that the whole concept of MFA is anthropocentric, with ecological functions perceived based on a human perspective and based on their indirect impact on the social sphere. Yet, for the purpose of this review and for analytical reasons, we find it helpful and appropriate to still make this distinction in order to shed light on farms' social role(s), independently from the way these are embedded with ecosystems in the first place.
3. We acknowledge that using Google Scholar in a systematic literature review needs to be carefully considered. Since the search algorithm is unknown and searches are adapted to a user's personalized information, the search is most likely not replicable and there is the danger of the so-called 'bubble effect', which means some kind of selection bias (Piasecki et al. (2018)). Despite these limitations, it was decided to include 100

publications listed in Google Scholar in the primary literature body in order to cover a broader range of publications than listed in Scopus. Specifically, we selected the top 50 most cited publications plus the 50 most recently cited publications cited. Our main reason behind the decision to use Google Scholar is that we were most concerned with the range of publications covered and not much with any statistical representativeness. The search results confirmed our decision in terms of the diversity of publications covered and the number of publications that were found through Google Scholar and were finally included (19/25).

4. Functions fulfilled by agriculture are always specific in time and place (Renting et al., 2008), which was a reason for us to not go too far back into the past. Around 2000, the concept of multifunctionality gained importance in policy designs and a territorial perspective of rural areas began to replace the sectoral view.
5. Another term found in the analysed literature and that could be understood as a conceptual approach overlapping with ideas behind LAFs and rural webs is 'regional agriculture', applied by Donkers (2008). Yet, we neither found 'regional agriculture' to be clearly defined nor could we find other publications using this term in a conceptual way when checking the references.

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